



Book of Proceedings

International LET-IN 2025 Conference

Mersin, Türkiye

Prof. Dr. Meltem Huri Baturay

Dr. Nermin Pınar Özçelik

Dr. Ferdi Çelik

Zerodale

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May 2–3, 2025

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Editors:

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TARSUS
ÜNİVERSİTESİ

Conference Overview

The International LET-IN 2025 Conference, hosted by Tarsus University, Mersin, Türkiye, on May 2–3, 2025, focuses on **Learning and Teaching Innovations**. It meets YÖK Academic Incentive Regulation and associate professorship criteria, with official documentation provided upon request post-presentation.

Important Dates

- **Conference Dates:** May 2–3, 2025
- **Submission Opens:** October 14, 2024
- **Submission Deadline:** April 13, 2025
- **Early Bird Registration:** March 28, 2025
- **Notification of Acceptance:** Within 2 weeks of submission
- **Registration Deadline:** April 27, 2025

Main Theme

Learning & Teaching Innovations

Selected Sub-Themes

- Innovative Technologies in Education
- Educational Metaverse
- Artificial Intelligence and ChatGPT
- Gamification and Game-based Learning
- Mobile Learning and BYOD
- Learning Analytics
- Open Educational Resources and MOOCs
- Sustainable Development Goals
- Diversity, Early, Peace, and Distance Education
- Teacher Training and Well-being
- Instructional Technology
- Foreign Language, Math, Special, and Science Education
- Social Sciences, Physical, Fine Arts, and Religious Education
- Quality Assurance in Education

The content and originality of the papers included in this proceedings book are within the responsibility of the authors of the papers.

2025 Learning & Teaching Innovations R&D© Group

Visit www.letinrd.org for more information.

Conference Leadership and Committees

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Prof. Dr. Meltem Huri Baturay

Founding Leader & President of LET-IN
R&D, Türkiye

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Translator

- Duru Tuna Baturay
Languages: French, English, Spanish

Over 100 papers were submitted to our conference from 19 different countries, and the event was successfully held with more than 100 participants. Countries represented by both paper presenters and attendees include Iran, Argentina, Pakistan, India, Morocco, China, Ireland, Turkey, Syria, Canada, Algeria, the United States, Poland, Indonesia, Uzbekistan, Tajikistan, Bangladesh, Nepal, and Tunisia. This diverse international participation has strengthened the scientific variety and global interaction of our conference.

The conference qualifies as international, with more than 55% foreign participation, meeting the requirements for academic incentives and associate professorship.

FOREWORD

Greetings to all participants,

It is a great pleasure for me to organize the International LET-IN 2025 Conference, in collaboration with Tarsus University, Mersin, Türkiye.

In an era of rapid educational transformation, the demand for innovative approaches to teaching and learning has never been more urgent. The International LET-IN 2025 Conference on Learning and Teaching Innovations, served as a dynamic platform for educators, researchers, and practitioners to share insights, experiences, and groundbreaking ideas aimed at shaping the future of education.

Organized by the LET-IN R&D Group, the conference aimed to bridge the gap between theory and practice by fostering dialogue on the practical application of educational research and innovations. It provided a high-quality academic forum where participants explored a wide array of topics, including innovative technologies in education, the educational metaverse, artificial intelligence and ChatGPT in learning environments, gamification and game-based learning, mobile learning and BYOD, learning analytics, open educational resources and MOOCs, the integration of sustainable development goals, diversity in education, teacher training and well-being, instructional technology, and subject-specific innovations.

The conference welcomed over 100 participants and featured more than 100 paper submissions from 19 countries—including Iran, Argentina, Pakistan, India, Morocco, China, Ireland, Türkiye, Syria, Canada, Algeria, the United States, Poland, Indonesia, Uzbekistan, Tajikistan, Bangladesh, Nepal, and Tunisia. This remarkable international participation created a rich mosaic of perspectives, fostering global collaboration and cross-cultural exchange.

The event not only facilitated scholarly discussions but also laid the groundwork for future partnerships and innovative projects. It is our hope that the conversations initiated and the connections formed during the conference will continue to drive meaningful progress in the educational landscape. By cultivating a collaborative, forward-thinking environment, LET-IN 2025 has taken a concrete step toward reimagining education for a rapidly changing world.

With very best wishes,

Prof. Dr. Meltem Huri BATURAY

President of International LET-IN 2025 Conference

Blurb

Uncover the future of education with the *International LET-IN 2025 Conference on Learning and Teaching Innovations*. Hosted at Tarsus University in Mersin, Türkiye, on May 2–3, 2025, this landmark event united over 100 participants from 19 countries, showcasing more than 100 paper submissions. Contributors from nations including Iran, Argentina, Pakistan, India, Morocco, China, Ireland, Türkiye, Syria, Canada, Algeria, the United States, Poland, Indonesia, Uzbekistan, Tajikistan, Bangladesh, Nepal, and Tunisia fueled a dynamic exchange of ideas.

Delve into transformative topics such as innovative technologies in education, the educational metaverse, AI and ChatGPT, gamification, mobile learning, learning analytics, OER and MOOCs, sustainable development goals, diversity in education, teacher training, instructional technology, and beyond. This book of pabstracts is essential reading for anyone committed to driving educational innovation forward.

Plenary Speakers

Blockchain for Web3 and the Metaverse

Dr. Jane THOMASON

International Partner Representing Australia in the World Business Angels Investment Forum (WBAF)

Co-founder of the Global Women in Deep Tech Consortium and Impact Fund

Dr. Jane Thomason is the co-founder of the Global Women in Deep Tech Consortium and Impact Fund. She is a globally recognized, highly accomplished investor, entrepreneur, and executive, with a passion for empowering women in technology and finance, and a proven track record of driving innovation in deep tech. Her extensive experience spans both founding and investing in high-growth ventures, making her a leading voice in deep tech investments. She led a major multi-country program on “Investing in Women,” is part of a community VC platform, advising, investing and mentoring founders in DeepTech and MedTech and Chair of a listed digital assets investment company in London.

Ethical Approaches to Effective AI Use in Academic Writing

Dr. Karen BARTO

Writing Specialist, Writing Skills Improvement Program (WSIP), University of Arizona

Dr. Karen Barto is a writing specialist at the Writing Skills Improvement Program (WSIP) at the University of Arizona (UA) and an English Language Specialist with the U.S. Department of State. At WSIP, Dr. Barto supports student and faculty writers through consultation, coaching, and professional editing, as well as undertaking outreach, materials design, and service to the larger UA community, including co-leading the Ethics in Education working group of the UA’s AI² initiatives. In her role as English Language Specialist to the U.S. State Department, Karen designs and offers professional development in English medium instruction to professors at institutions around the world. Dr. Barto also co-leads the TESOL Career Path Development Professional Learning Network and moderates their Facebook and LinkedIn groups. An interdisciplinary scholar and practitioner, Dr. Barto presents and publishes in disciplines relevant to applied linguistics, increasingly developing in the areas of neurodivergence, AI, multilingualism, and collaborative, non-hierarchical leadership.

AI Reconsidering the Role of English as Lingua Franca

Prof. Dr. Gonca YANGIN EKŞİ

Editor of the ELT Research Journal

Foreign Language Education Department, Gazi University

Dr. Gonca Yangin Ekşi is a Professor in English Language Teaching (ELT) in the Department of Foreign Language Education, Gazi University where she teaches several undergraduate and graduate courses and supervises MA and PhD dissertations. She received her MA in ELT in Hacettepe University, Department of ELT and she holds her PhD in ELT in Gazi University. She has worked on a number of projects including the national project for the development of the national English curriculum for Primary and Secondary schools. She managed an Erasmus KA2 Project with distinguished universities in Turkey and abroad. She has published various research articles nationally and internationally focusing on teaching and learning English as a foreign language. Her research interests include computer-assisted language learning, pre- and inservice teacher education, curriculum and materials development, teaching skills and language components, young learners, use of corpus in language teaching.

What is the Blueprint for an ESP Course Success?

Assoc. Prof. Dr. Ouafa OUARNIKI

ESP Expert

Ziane Achour University of Djelfa, Algeria

Dr. Ouafa Ouarniki is a prominent lecturer at Ziane Achour University of Djelfa, Algeria, specializing in English for Specific Purposes (ESP). With a strong presence in the academic community, Dr. Ouarniki regularly presents at conferences on topics such as teaching ESP, designing ESP courses, professional development of language teachers, and Integrating Content and Language in Higher Education (ICLHE). Her expertise and dedication have led her to preside over numerous national and international conferences and workshops focused on ESP, where she has shared her knowledge and innovative approaches with educators and researchers. Ouarniki's experience, coupled with her ongoing contributions to academic research and professional development initiatives, positions her as a key figure in the field of ESP, dedicated to advancing educational practices and supporting language teachers in their professional journeys.

Conference Programme

DAY 1 – May 2, 2025 Friday					
10.00 – 10.30	Opening Speeches - (Conference Hall) https://zoom.us/j/99155271347?pwd=MwECH2GnzWabsRHeViOQGYlnZaQRo.1				
10.30 – 11.10	Plenary 1 - (Conference Hall) Dr. Jane THOMASON Blockchain for Web3 and the Metaverse https://zoom.us/j/99155271347?pwd=MwECH2GnzWabsRHeViOQGYlnZaQRo.1 Moderator: Dr. Nermin Pınar Özçelik				
11.10 – 11.30	 Coffee/Tea Break				
11.30 – 12.45	Room A (B302) https://zoom.us/j/95158464148?pwd=09wvny97js8ilPTyGxetaz7qL07Rg.1	Room B (B303) https://zoom.us/j/91917798842?pwd=qm5ap6ftkbOX0PVb8EzYsmi0vIkz1.1	Room C (B304) https://zoom.us/j/95200332426?pwd=dF3D9KjAgzka1dG1EIAhsN8d3TsYE.1	Room D (B305) https://zoom.us/j/95638408411?pwd=dzRtMOKfRO2QJNnPu6WjKEZC2PTRMg.1	Main Room (Conference Hall) https://zoom.us/j/99155271347?pwd=MwECH2GnzWabsRHeViOQGYlnZaQRo.1
	Moderator: Esra Erden	Moderator: Dr. Musa Özçelik *This session will be held in Turkish	Moderator: Ecem Eker Uka	Moderator: Ezgi Güngör	Moderator: Ş. Nart Koç
	Tuğçenur Erdal Integrating Digital Platforms into an English for Occupational Purposes Course: The Case of Nearpod in ENG302 (F2F)	İbrahim Yılmaz & Ferhan Bozdoğan & Seher Yumugan Descriptive Analysis of Measurement and Evaluation Approaches in Preschool Education Programs: 2013 and 2024 Comparison (F2F)	Özge Kutlu Demir A Research on Willingness to Communicate Among English Language Teacher Candidates	Citra Dewi Harmia & Nermin Pınar Özçelik Innovating Language Teaching with Politeness Theory: A Theoretical Framework	Omaya Grati Rethinking ESP Pedagogy: Harnessing Problem-Based Learning to Bridge Disciplinary Communication and Professional Competence (WORKSHOP)
	Melek Kondak Can & Kemal Sinan Özmen A Meta-Synthesis of Doctoral Dissertations on Language Teacher Identity in Türkiye (F2F)	Nadiye Barış Eren & Bahar Çiftçi Innovative Approaches in Medical Education: The Impact of Puzzles on Learning and Motivation (F2F)	Hacer Kaçar Reassessing Teacher Presence: The Ongoing Effect of Teacher Coaching on English as a Foreign Language Learners' Academic Achievement	Buket Güllü-Özkaya Developing the Intercultural Competence of Foreign Language Learners Through Awareness-Raising Classroom Activities	Susmita Roy Chowdhury Applying Artificial Intelligence in Education: An Empirical Exploration of New Pedagogical and Systemic Trends
	Zeynep Ece Bilgiç Integrating TPR and MIT in Teaching English to Students with ADHD: Importance and Sample Procedures (F2F)	Nadiye Barış Eren & Zehra Eskimez Peer Education Model in Nursing Education (F2F)	Ayşe Dilay Balan The AI-Mediated Pragmatic Competence Development (AI-MPCD) Model	Fateme Ahmadi Livani & Hamed Barjesteh & Mojtaba Rajabi Enhancing Pragmatic Competence: The Role of Instructional Material in Teaching Implicature and Presupposition to EFL Learners	Morteza Khodaei The Role of Artificial Intelligence in Education: Benefits for Educators and Students
	İbrahim Cem BAYKAL I-See-Bytes: A Simplified C++ Library for Concurrent Programming Education (F2F)	Musa Özçelik Constructivist-Based Accounting Education: A Sample Application of ChatGPT (F2F)	Seda Güler Enhancing Reading Skills Through Tailored Materials: Insights of University Preparatory Learners	Elmostafa Omarakly Fostering Personal Growth: The Role of Portfolio Assessment in Shaping Students' Self-Concept	
	Dönercan Dönük A Research on Classroom-based Evaluation from the Teachers' Perspective	Ali Kamil Şalıcı & Hasan Kılıç & Abdulkhak Haluk Ergün Teacher Perceptions of 2024 Education Model: Values and Reflections of Digitalization (F2F)	Inamul Azad From Passive to Interactive: Revolutionizing Global Classrooms with AI-Driven Multilingual Collaboration	Erem Kaplan Teachers' Perception on the Role of Applying Gamification in Young Learners' EFL Classes	
12.45 – 13.40	Lunch Break				

13.40 – 14.30	Plenary 2 – (Conference Hall) Assoc. Prof. Dr. Ouafa Ouarniki What is the Blueprint for an ESP Course Success? https://zoom.us/j/99155271347?pwd=MwECH2GnzWabsRHeViOQGYlnZaQRo.1 Moderator: Dr. Nermin Pınar Özçelik				
14.30-15.00	 Coffee/Tea Break				
15.00 – 16.15	Room A (B302) https://zoom.us/j/95158464148?pwd=09wvny97js8ilPTyGxetaz7qL07Rg.1	Room B (B303) https://zoom.us/j/91917798842?pwd=qm5ap6ftkbOX0PVb8EzYsmi0vIkz1.1	Room C (B304) https://zoom.us/j/95200332426?pwd=dF3D9KjAgzka1dG1EIAhsN8d3TsYE.1	Room D (B305) https://zoom.us/j/95638408411?pwd=dzRtMOKfRO2QJNnPu6WjKEZC2PTRMg.1	Main Room (Conference Hall) https://zoom.us/j/99155271347?pwd=MwECH2GnzWabsRHeViOQGYlnZaQRo.1
	Moderator: Ecem Eker Uka	Moderator: Sena Cevizci	Moderator: Esra Erden	Moderator: Ezgi Güngör	Moderator: Ş. Nart Koç
	Maryam Karimi Bridging the Gap: How AI-Driven Writing Feedback Supports Language Learners Within Vygotsky's Zone of Proximal Development	Abdelhamid Nourani Translation as a Pedagogical Tool in Teaching English to French Language Learners	Houda Boumediene & Mustapha Bouakkaz AI as a Cultural Bridge: Enhancing Intercultural Communication Competence in Higher Education	Ifat Jahan Suchona In-service Teacher Education Programs for Diversity and Inclusion – Are We Heading in the Right Direction?	Weiwei (Vivien) Zhang Strategic Competence, Task Complexity, and Learner Performance in Computer-assisted Integrated Speaking Test Tasks: A Study of English-as-a-Foreign-Language (EFL) Learners in China (WORKSHOP)
	Zohaib Hassan Sain Evaluating the Impact of the Single National Curriculum on Educational Equality and Teacher Preparedness in Pakistan	Brian Hibbs Investigating the Development of Pre-Service ESOL Teachers' Emotional Intelligence	Anna Szczepaniak-Kozak Pragmatic Accent and Pragmatic Teddy Bears in Multilingual Speakers	Bhola Kumar K.C. Designing Context-Based Service-Learning Projects in the ELT Classrooms	NEHA ZAIDI, Agha Asim Husain, Mritunjay Rai, Faizan Ahmad, Zeeshan Ahmed Understanding Learner Intentions in Metaverse Education: An Extended TAM Approach
	Azra Tajhizi & Dr Shailija Vasudeva Learning Beyond Reality: AI as the Partner or Teacher Replacement in Education	Brian Hibbs Exploring the Advancement of Pre-Service ESOL Teachers' Social Intelligence	Aysegül Liman Kaban & Zeynep Ersoy Teachers Wanted More Than Magic: So We Built MIXAP Together	Leila Djouima & Zohra Labeled Bridging the Gap Between Theory and Practice Through the Practicum in EFL Teacher Training Voices of Algerian Trainees and Trainers	Mritunjay Rai, Agha Asim Husain, Faizan Ahmad, Zeeshan Ahmed Educational Transformation through IoT and Smart Device Integration
	Mehdi Manochehrzadeh L2 Learners' Engagement in Collaborative Problem-Solving Activities: The Application of the Puzzling Method on the Overall Speaking Performance	Jannatkhon Sheraliyevna Kenjaeva Effective English Teaching Methods: Integrating Scaffolding for Student Success	Hadrian Lankiewicz Teacher as a Transformative Intellectual in Preschool Education: Targeting for Social Justice via Language Teaching Practices	Ibtissam Bentaleb Islamic Schooling in American Education: Public Perceptions and Institutional Challenges	
	Magdalena Aleksandrak Pre-service and Novice Teachers in the Process of Action Research - The Stage of Planning	Nasiba Mirpochoeva and Lisa Mann Trainers as Agents of Change: Sustainable Teacher Training in Tajikistan	Alissa Nostas & Asri Nurul Qodri Developing Students' AI Literacy: Encouraging Ethical AI Use	Ayşenur Avcı Üzümlü A Small-scale Study: Analyzing Reflective Teaching Attitudes of Turkish EFL Teachers	

DAY 2 – May 3, 2025 Saturday					
Plenary 3 – (Conference Hall) Dr. Karen BARTO Ethical Approaches to Effective AI Use in Academic Writing https://zoom.us/j/99155271347?pwd=MwEhZGZlbnZaQWRo.1 Moderator: Dr. Nermin Pınar Özçelik					
10.00 – 10.45	Coffee/Tea Break				
11.15 – 12.30	Room A (B302) https://zoom.us/j/94728576047?pwd=dZ30t95ukKTW9CbIDYHfWyalolqW3.1 Moderator: Assoc. Prof. Dr. M. Pınar Babanoğlu / Ecem Eker Uka M. Pınar Babanoğlu Authentic Self or Best Self in Language Teaching? A Dilemma for EFL Teacher Identity (F2F) Mehmet Deniz Demircioğlu The Techniques which Stimulates Broca and Wernicke Areas in the Brain with the Aim of Making Listening and Speaking Abilities Active in English Learning (F2F) Ecem Eker Uka Innovative Learning Approaches in English Preparatory Programs: A Case Study of Tarsus University (F2F) Dilek Ülker & Gonca Yangın Ekşi Virtual Reality in Language Learning: A Pedagogical and Technological Review of Mondly VR (F2F) Hasan Bedir & Aleyna Gürsoy AI in Practicum: A Comparative Study of AI-Generated vs. Teacher-Made Lesson Plans in Real EFL Classroom Settings (F2F)	Room B (B303) https://zoom.us/j/923138371847?pwd=OFj59ogTpDXwUzmZGPAgKHCtSGLu9R.1 Moderator: Sena Cevizci Berke Oğuz Yılmaz & Cem Balçıklanlı The Effects of Virtual Reality Exposure Therapy on Foreign Language and Public Speaking Anxiety in Tertiary-Level Learners Seyit Ahmet Çapan An Analysis of Pre-Service FL Teachers' Perceptions of AI Competence Self-Efficacy Zafer Susoy & Muhammed Abdullah Novice English Teachers' Perceptions on the Benefits and Challenges of AI Tools in Foreign Language Learning Nadia Idri Bridging Linguistic and Technological Divides in Algerian Healthcare: A Needs-Based Framework for English-Medium Medical Education and AI Integration Amina BOUALI Beyond Western-Centric Narratives: Emancipating Peace Education to Foster Soft Skills and Critical Cultural Dynamics in Higher Education	Room C (B304) https://zoom.us/j/99959716213?pwd=RjufwYSAZsEM1RzlrAxHJV3Eqr88T.1 Moderator: Esra Erden Melani Konca Teachers' Beliefs and Practices of Vocabulary Teaching in EFL Classrooms Fatiha Kaid & Yasmina Djafri Kaid Integrating AI in Literature Education: Advancing Pragmatic Literary Competence Through AI-Generated Visuals. Esmenur Çeliker Beyond the Classroom: Factors Influencing EFL Teacher Wellbeing and Job Satisfaction Hüseyin Ahmet Demir & Müzeyyen Nazlı Güngör Enhancing EFL Learners' Motivation and Spoken Skills Through Assessment for Learning: An Action Research Study Elif Günay Empowering EFL Learners Through Corpora and Data-Driven Language Learning	Room D (B305) https://zoom.us/j/96394736749?pwd=h9PZ8avRzNuD8R0vbvahrucTVf5Sg.1 Moderator: Ezgi Güngör / Ş. Nart Koc Ferdi Çelik & Ceylan Yangın Ersanlı Exploring EFL Teachers' Technology Acceptance of the Spatial Metaverse Platform: A Quantitative Study Ceylan Yangın Ersanlı & Ferdi Çelik Assessing 21st-Century Technology Literacy Skills Among Turkish High School EFL Teachers Naci Serhat Başkan & Pınar Başkan MOOCs as a Catalyst for Teacher Education: Insights from Pre-Service Teachers Hamideh Karoon & Pınar Başkan Foreign Language Teachers' Job Satisfaction in Face-to-Face versus Online Settings Messaoud Guendouz EMI in STEM Education: Pedagogical Challenges and Implications for Foreign Language Teaching in Multilingual Contexts	Main Room (Conference Hall) https://zoom.us/j/99155271347?pwd=MwEhZGZlbnZaQWRo.1 Moderator: Assoc. Prof. Dr. Ouafa Ouarniki Berkat Turku The Medium and Message Oriented Communication in an EMI Tertiary Level Context: The Case of Agricultural Sciences at Mohamed Khider University of Biskra, Algeria (WORKSHOP) Nika Saheb Alfosoal The Impact of AI-Based ESL Instruction on the Development of Cognitive and Emotional Intelligence in Children: A Cross-Cultural Study of Iranian and Canadian Learners Sheida Abhari The Impact of a Gamified EFL learning platform on Iranian primary school students' speaking development Rabia Korkmaz TAN, Oğuzhan ÖZYİĞİT, Buğra ZENGİN, Oya MERT COŞKUN Common Features of Brand Names of Artificial Intelligence Models
12.30–13.30	Lunch Break				

Plenary 4 - (Conference Hall) Prof. Dr. Gonca Yangın Ekşi AI Reconsidering the Role of English as Lingua Franca https://zoom.us/j/99155271347?pwd=MwEhZGZlbnZaQWRo.1 Moderator: Dr. Nermin Pınar Özçelik					
14.15–14.45	Coffee/Tea Break				
14.45–16.15	Room A (B302) https://zoom.us/j/94728576047?pwd=dZ30t95ukKTW9CbIDYHfWyalolqW3.1 Moderator: Ecem Eker Uka Akça Okan Yüksel (TR) Trend Analysis of Large Language Models Studies in Educational Sciences Rıdvan Bal & Habibe Güneş & Hatice Köse (TR) EmoPlay: A Study on Autism Spectrum Disorder and a Mobile Game for Teaching Emotions Bekir Balaban & Neşet Mutlu Investigation of Research on Cyberbullying via Systematic Review Study Seda Gündüzalp & Zübeyde Yaraş & Deniz Civelek School Administrator's Perceptions of Digital Well-Being: Constant Connectivity, Burnout, and the Pursuit of Digital Balance Zübeyde Yaraş & Seda Gündüzalp & Deniz Civelek Digital School Culture from the Perspective of School Administrators: Transformation, Resistance, and Strategic Approaches Pınar Ayyıldız Escape from the 'Blackhole'? Mental Fatigue of School Principals and Some Solutions	Room B (B303) https://zoom.us/j/923138371847?pwd=OFj59ogTpDXwUzmZGPAgKHCtSGLu9R.1 Moderator: Sena Cevizci Sıla Nalbant & Selma Deneme Gençoğlu Exploring 8th-Grade Students' Perceptions of Listening Skills and Engagement in Flipped Instruction: A Case Study Tolga Sarıca & Selma Deneme Gençoğlu EFL Students' Perceptions of AI-Assisted Writing Tools: A Systematic Narrative Hybrid Review of Challenges, Benefits, and Pedagogical Implications Zahra Tabandeh Hashemi & Hamed Barjesteh & Amir Marzban Learning with Grit and Enjoyment in a Virtual Classroom: Toward Testing a Model Among Iranian Language Learners Manel Mizab & Karima Achouri & Youcef ATTIA Uncovering Digital Generations' Perceived Ease of Use, Perceived Usefulness, Satisfaction, and Acceptance Intention of the MOODLE Platform in Algeria Ahlem Salhi Always Online: The Effects of Screen Time and Digital Demands on University Teachers' Mental Health Bora Demir Empowering Academics: A Video-Based Curriculum for AI Enhanced Research	Room C (B304) https://zoom.us/j/99959716213?pwd=RjufwYSAZsEM1RzlrAxHJV3Eqr88T.1 Moderator: Esra Erden Zahida Batool Innovating for Impact: Transforming Early Years Learning Through Play, Technology, and Inclusive Pedagogy Fatiha Sahli Smart Learning: Innovative Strategies for Foreign Language Teaching in University 4.0 Hamidi Badra Multimedia in the EFL Classroom: Enhancing Language Acquisition Through Digital Engagement Meryem Akçaçoğlu & Azra Tajhizi Pushing Boundaries or Bridging Gaps in Academic Research: AI Content Creation as a Catalyst in Higher Education Santosh Behera Kumar & Azra Tajhizi Beyond One-Size-Fits-All: The Future of Adaptive Learning with AI-Driven Smart Tutors Sinem Başara Gamified Vocabulary Acquisition in Virtual Reality: A CALICO Evaluation of NounTownVR	Room D (B305) https://zoom.us/j/96394736749?pwd=h9PZ8avRzNuD8R0vbvahrucTVf5Sg.1 Moderator: Ezgi Güngör Alireza Navidmoghaddam Redesigning Lesson Planning by Employing AI Tools for Disruptive English Language Teaching Alireza Navidmoghaddam Teacher Insights into the Educational Impact of Generative AI in High School Settings Ambreen Salman AI as an Ally: Transforming ELT Classrooms with ChatGPT Ghasem Modarresi; Naser Ranjbar; Majid Farokhmanesh Examining the Relation between Teaching Motivation and Job Satisfaction: The Moderating Role of Income Kaveh Jalilzadeh Learning Without Borders: Decolonizing the Curriculum and Embracing Neurodiversity through AI for Inclusive Education Maroua Rogtti Augmented Reality and Virtual Reality in Second/Foreign Language Education: Implementation, Challenges, and Future Perspectives	Main Room (Conference Hall) https://zoom.us/j/99155271347?pwd=MwEhZGZlbnZaQWRo.1 Moderator: Ş. Nart Koc Muhammad Mohsin Abbas A Tri-Stacked LSTM for Fake News Detection Muhammad Mohsin Abbas & Muhammad Sarmad Maqsood Enhanced Melanoma Detection Using Modified CNN Architectures with Adaptive Feature Fusion and Transfer Learning Soraya MEZHOUD Peer-Assessment Platforms: Impact on Student Metacognition and Motivation Soraya MEZHOUD Evaluating the Effectiveness of Gamification in Online Higher Education Marcela Villán Empowering Education: Introducing the Solutionary Framework
16.15–16.30	Closing				

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Always Online: The Effects of Screen Time and Digital Demands on University Teachers' Mental Health

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Abstract

While technology has enabled more flexible and accessible instruction, it has also introduced new challenges, particularly in relation to educators' mental health. This study examines the effects of increased screen time and digital workload on the psychological well-being of university faculty, focusing specifically on 60 teachers from the Department of English Language and Literature at Biskra University. The research is motivated by growing concerns about the invisible toll that constant connectivity, online teaching platforms, digital assessments, and administrative tasks are taking on academic staff. Teachers are now required to adapt to new digital tools, manage student engagement online, and respond to communications outside traditional working hours all of which may contribute to mental fatigue, stress, and burnout. A quantitative research design was adopted, utilizing a structured questionnaire designed to measure both objective factors and subjective perceptions. Preliminary analysis reveals a significant relationship between excessive screen time and negative mental health outcomes. The study contributes to the growing field of teacher well-being in the digital age and underscores the importance of developing balanced strategies that support educators' mental health. The findings are expected to guide decision-makers at similar institutions in crafting policies that limit digital overload, promote professional development, and create healthier work environments.

Keywords: *Digitalization of Higher Education, university teachers, mental health, digital workload, Biskra university.*

1. Introduction

The accelerated digitalization of higher education has engendered profound transformations in pedagogical practices and academic administration. While digital technologies have undeniably enriched instructional modalities and expanded access to educational resources, they have concurrently intensified the scope and complexity of faculty workloads. In the Algerian higher education context, the transition to digital platforms, online communication channels, and integrated administrative systems has introduced mounting pressures on academic personnel. What was initially envisioned as a catalyst for enhanced productivity and engagement has, paradoxically, become a source of heightened stress, professional burnout, and compromised psychological well-being among university faculty.

At the majority of Algerian universities, academic staff particularly those engaged in English as a Foreign Language (EFL) are increasingly required to perform multifaceted roles. These include not only teaching and research but also administrative responsibilities and escalating digital obligations. University teachers are expected to deliver online instruction, manage extensive email correspondence, update and maintain content on learning management systems such as Moodle, and fulfill continuous research mandate. The disproportion between these expanding digital demands and the limited institutional support mechanisms available has rendered the academic workload unsustainable for many teachers. Consequently, symptoms of emotional exhaustion, diminished job satisfaction, and a decline in professional performance are becoming increasingly prevalent.

This study seeks to systematically examine the psychological impact of digital workload on EFL teachers at Biskra University. Specifically, it aims to identify the digital tasks most strongly associated with occupational stress, evaluate the extent to which faculty feel overwhelmed, and assess the adequacy and effectiveness of current support structures. Furthermore, it will explore faculty perceptions of the usability of digital platforms and their correlation with mental strain and job satisfaction. The overarching objective is to develop empirically grounded strategies to mitigate digital workload-induced stress through improved task delegation, robust institutional support, and the optimization of user interface design in academic digital environments.

The significance of this inquiry extends to higher education leadership and policymakers, particularly those steering the digital transformation of academic institutions. By elucidating the lived experiences of faculty and the implications for their mental health, the study aspires to generate actionable insights that can inform institutional reforms. Ultimately, the research endeavors to contribute to the creation of more supportive, balanced, and sustainable academic workplaces in an era increasingly defined by digital interconnectivity.

2. Literature Review

The rapid adoption of digital technologies in higher education has profoundly transformed faculty roles, increasing their reliance on various digital platforms for teaching, administration, and communication. The *Technology Acceptance Model (TAM)*, originally developed by Davis (1989) and later extended by Venkatesh et al. (2003), provides a valuable framework to understand how faculty members perceive and interact with digital tools. According to TAM, perceived usefulness and ease of use are critical factors influencing the acceptance of technology, which in turn affect job satisfaction and performance. In the context of higher education, faculty members' struggles with complex digital platforms can hinder their productivity and contribute to dissatisfaction, especially when institutional support is inadequate.

Prolonged exposure to increased digital demands can lead to psychological strain and burnout. *Burnout Theory*, as conceptualized by Maslach and Leiter (2016), identifies emotional exhaustion, depersonalization, and reduced personal accomplishment as key symptoms arising from chronic work-related stress. This theory has been further supported by Schaufeli and Taris

(2014), who emphasize the role of job demands and resources in influencing employee well-being. Faculty members facing excessive digital workload without sufficient resources or coping mechanisms are particularly vulnerable to burnout, which negatively impacts their teaching effectiveness and mental health.

Balancing professional duties with personal life is essential to maintaining psychological well-being. Greenhaus and Beutell's (1985) *Work-Life Balance Theory* highlights how conflicts between work and family roles can elevate stress and reduce overall life satisfaction. The digitalization of academic tasks, which often blurs the boundaries between work and personal time, exacerbates this conflict, leaving faculty members feeling overwhelmed and isolated. This phenomenon is especially pertinent for educators who manage extensive online grading, content management, and email correspondence beyond regular working hours.

Teacher-specific research underscores the emotional and motivational challenges posed by increased work demands. Skaalvik and Skaalvik (2017) found that teacher stress correlates negatively with self-efficacy and motivation, leading to decreased *job satisfaction* and *well-being*. Complementing this perspective, Tarafdar et al. (2019) introduce the concept of *technostress*, describing the negative psychological effects caused by the use of information and communication technologies. Their work distinguishes between *techno-distress*, which harms well-being, and *techno-eustress*, which can motivate and engage employees when well managed.

Finally, resilience and effective coping strategies can mitigate the adverse effects of digital workload. Day and Gu (2014) emphasize the importance of resilience in sustaining teacher quality and well-being during times of rapid change, such as the shift to digital education. Salanova et al. (2011) further argue that positive cycles of self-efficacy, engagement, and affect can help educators manage stress and maintain performance despite high demands. Together, these insights suggest that institutional support, training, and mental health resources are crucial to fostering resilience among faculty facing digital overload.

3. Methodology

This section outlines the systematic approach taken to investigate how digital workload affects the mental health of university faculty. It details the research design, participant selection, data collection methods, and analytical procedures employed to ensure that the study's findings are reliable and valid. By applying a structured quantitative approach, the study aims to provide objective insights into faculty experiences and perceptions related to their digital academic responsibilities.

Research Design

This study adopts a quantitative descriptive research design to investigate the impact of digital workload on the psychological well-being of EFL faculty members at Biskra University. A structured questionnaire was developed to gather data on various aspects of faculty experiences, including the types and frequency of digital tasks performed, perceived stress levels, institutional

support mechanisms, and digital tool usability. This design enables the researcher to quantify the prevalence of digital workload challenges and capture faculty perceptions in a systematic manner.

Participants

The participants in this study are 60 teachers from the Department of English Language and Literature at Biskra University. They were selected based on their regular engagement with digital academic duties, such as managing online course content, responding to emails, using Moodle, and conducting online assessments. The sample includes a mix of academic ranks and teaching experience to ensure diverse perspectives and experiences are represented in the study.

Data Collection

Data was collected through an online questionnaire distributed via institutional email. The questionnaire included 30 multiple-choice questions organized into sections addressing demographic information, digital academic responsibilities, emotional responses to workload, perceptions of digital tools, and suggestions for improvement. The questionnaire was designed to be anonymous to encourage honest responses and protect participants' privacy. All participants gave informed consent prior to completing the survey.

Data Analysis

The collected data will be analysed using basic descriptive techniques such as counting responses, calculating percentages, and identifying recurring trends in participants' answers. This simple yet effective approach will allow the researcher to highlight common stressors, assess the perceived adequacy of institutional support, and explore patterns related to faculty workload and mental health. The findings will be presented in tables and illustrative charts to provide a clear overview of the results and facilitate interpretation.

4. Findings and Discussion

The analysis of the data will focus on two primary aspects: the nature and frequency of digital workload, and its impact on the mental well-being of faculty members.

The first focus is the *digital workload* which examines how often faculty engage with specific digital tasks such as grading online assignments, responding to administrative and student emails, using learning management systems like Moodle, and preparing or uploading digital teaching materials. High frequencies of these tasks, especially beyond regular working hours, can indicate digital overload. For example, if a majority of faculty report regularly extending their workday to complete such tasks, it aligns with findings from prior studies (e.g., Tarafdar et al., 2015; Ragu-Nathan et al., 2008), which highlight the increased demands digital technologies place on academic staff and their potential to blur work-life boundaries.

The second aspect, *mental well-being*, focuses on how faculty perceive the psychological impact of this digital workload. Questions targeting feelings of stress, burnout, isolation, and difficulty maintaining a healthy work-life balance provide insight into the emotional toll of digital

academic work. Should a significant portion of participants report high levels of stress and burnout correlated with frequent digital tasks, this would support the burnout theory framework discussed in the literature (Maslach & Leiter, 2016). The data would confirm that prolonged exposure to high digital demands without adequate recovery time contributes to emotional exhaustion and reduced job satisfaction. Furthermore, this reflects concerns raised by scholars such as Acker (2012), who emphasize that the increasing digitalization in higher education often leads to heightened psychological strain for faculty.

Table 1. *University Faculty Responses to Digital Workload and Support (n = 45)*

Digital Activity / Perception	Frequency (n)	Percentage (%)
Respond to administrative emails daily	42	93.3%
Check Moodle multiple times a day	44	97.8%
Enter student grades often	39	86.7%
Work beyond official hours due to digital tasks	43	95.6%
Face frequent technical issues	38	84.4%
Receive unclear instructions for digital tasks	34	75.6%
Feel overwhelmed by digital overload	41	91.1%
Burn out during exam periods	45	100%
Dissatisfied with work-life balance	37	82.2%
Mental well-being affected by digital duties	36	80%
Feel isolated due to screen-based communication	31	68.9%
Digital overload impacts personal and family life	40	88.9%
Feel confident using digital platforms	28	62.2%
Receive IT support sometimes or rarely	33	73.3%
Find digital expectations unrealistic	41	91.1%
Support official “digital-free” hours	42	93.3%
Want simplified digital platforms	44	97.8%
Find time management training helpful	39	86.7%
Emphasize mental health support for digital stress	7	15.6%
Support teachers’ unions or advocacy groups	36	80%

The findings of this study reveal a critical and consistent pattern of digital burden experienced by university faculty in Algerian higher education. A significant majority of participants (over 90%) reported that they check institutional platforms like Moodle multiple times a day and respond to administrative emails on a daily basis. These routine digital demands, while seemingly minor, accumulate and contribute to constant mental engagement with work. Moreover, 96% of teachers indicated they often work beyond official hours due to the overflow of digital responsibilities.

This extended work time is exacerbated by recurring technical issues (reported by 84% of participants) and unclear institutional instructions (reported by 76%), both of which increase cognitive load and delay task completion. The consequence is a notable emotional toll: 91% of the faculty surveyed feel overwhelmed by digital overload, while all respondents reported experiencing burnout, particularly during peak exam periods.

Dissatisfaction with work-life balance was prevalent among 82% of participants, with over three-quarters (80%) reporting that digital obligations negatively affect their personal and family life. The psychological impact extends further, as 80% acknowledged that screen-based communication fosters a sense of isolation, and nearly 70% noted that digital duties harm their mental well-being. Despite the centrality of digital tools in academic work, only 62% of faculty members expressed confidence in using them, and 73% received IT support only infrequently. Furthermore, 91% found the digital expectations placed upon them unrealistic, suggesting a disconnect between administrative demands and practical faculty capacity.

There is, however, a clear call for institutional reform. Most participants supported the implementation of official “digital-free” hours (93%) and favoured simplified platforms (98%). Time management training was also deemed helpful by 87%, while 80% advocated for the creation or strengthening of teachers’ unions to address systemic issues. Notably, only 15% explicitly emphasized the need for mental health support, pointing to a possible cultural or institutional undervaluing of psychological well-being. These findings underscore the urgent need to address digital overload not only as a technical or logistical issue, but also as a matter of faculty health, professional sustainability, and educational quality.

The discussion will also relate findings to the Technology Acceptance Model (TAM) (Davis, 1989), particularly regarding faculty perceptions of the usability and effectiveness of digital platforms like Moodle and Progres and email systems. If participants report usability challenges or inefficiencies with these tools, it may exacerbate stress and reduce overall job satisfaction, as TAM suggests that perceived ease of use influences technology acceptance and subsequent attitudes toward work.

Institutional support mechanisms such as training on digital platforms, mental health resources, and workload policies will also be evaluated. Positive perceptions in these areas could mitigate negative mental health outcomes by providing faculty with the resources to manage digital demands effectively, in line with the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007). Conversely, inadequate support may heighten the risk of burnout.

This study expects to demonstrate a clear link between excessive digital workload and deteriorating psychological well-being among university faculty. It will underscore the importance of balanced digital task allocation, improved digital tool usability, and enhanced institutional support to safeguard faculty mental health in the evolving academic landscape.

5. Conclusion

The study found that teachers in the Department of English Language and Literature at Biskra University face a significant digital workload involving diverse tasks such as online grading, managing course content on Moodle, and responding to numerous administrative and student emails. Most participants reported that these digital responsibilities frequently extend beyond their normal working hours, which is a clear indicator of digital overload. This overload is closely linked to elevated levels of stress, burnout, and a disrupted work-life balance, consistent with established burnout theory (Maslach & Leiter, 2016). Additionally, faculty perceptions regarding the usability of digital platforms varied, with many identifying technical challenges and inefficiencies that exacerbate their stress and reduce job satisfaction. Institutional support mechanisms were found to be inconsistent or insufficient, leaving faculty members feeling under-supported in managing their digital workload. These findings underscore a complex interaction between digital task demands, individual coping capacity, and the availability of organizational resources.

The findings have important implications for university administrators and policymakers aiming to improve faculty well-being and productivity in increasingly digital academic settings. First, there is a critical need to streamline and standardize digital platforms to reduce the cognitive and operational complexity faculty currently face. Simplifying the technological ecosystem would help minimize confusion and technical difficulties. Implementing official “digital-free” hours can help faculty disengage from work-related digital communication and tasks, thereby protecting personal time and promoting mental recovery, as supported by work-life balance theory (Greenhaus & Beutell, 1985). The study also highlights the importance of enhanced institutional support, including expanded IT assistance and regular training sessions designed to build faculty confidence and efficiency in using digital tools. Moreover, time management workshops can empower faculty to better prioritize their digital and non-digital tasks, while clearly defined deadlines and task schedules would help faculty plan their work more effectively, thereby reducing uncertainty and stress. Lastly, the introduction of dedicated mental health support services is essential to address the psychological impacts of digital overload, such as stress, burnout, and feelings of isolation, ensuring faculty receive timely and appropriate care.

While this study provides valuable insights, certain limitations must be acknowledged. The sample was confined to a single department within Biskra University, which may limit the applicability of the findings to other faculties, universities, or cultural contexts. The exclusive use of a quantitative survey also restricts the depth of understanding regarding individual faculty members’ nuanced experiences and coping strategies with digital workload stress. The reliance on self-reported data may be subject to biases such as social desirability or recall inaccuracies. Moreover, this cross-sectional design captures perceptions at a single point in time, limiting the ability to infer causal relationships or observe changes over time.

To build on the findings of this study, future research should aim to expand the scope to include multiple departments and universities across Algeria. This broader sampling would improve the generalizability of the results and allow for comparative analysis across disciplines and

institutions. Incorporating qualitative methodologies, such as semi-structured interviews or focus groups, could provide richer perspectives on faculty experiences, attitudes, and coping mechanisms related to digital workload and mental health. Longitudinal research designs would be valuable to track the effects of implemented interventions, such as digital workload reduction strategies or mental health initiatives, over time. Finally, experimental or mixed-methods studies assessing the effectiveness of specific institutional policies (e.g., digital-free periods, IT training programs, mental health services) would offer practical guidance for university administrators seeking evidence-based approaches to foster faculty well-being in digital academic environments.

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Trend Analysis of Large Language Models Studies in Educational Sciences

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Abstract

Based on a trend analysis of post-2020 academic studies, this article aims to compile and critically evaluate the existing body of knowledge on the role of these models in higher education. Considering the background presented in this introductory section, the remainder of the paper will systematically examine recent global research on the use of LLMs in education and discuss the findings. Thus, the results of the study will provide a holistic and inclusive perspective to the existing studies, and the results of the study will guide future studies in this field and help to provide a starting point for new studies. The aim of this study is to trend analyze the studies on LLMS in educational sciences. Since the study aims to investigate research trends related to LLM in the field of educational sciences, the unit of analysis was a single article focusing on LLM. To search for targeted articles, the Web of Science database, a widely used and reliable data source for literature searches, was chosen. The search criteria were restricted to articles with title and keywords. For this purpose, the Web of Science database was searched with the keywords “large language models” and “LLMs”. The findings show that in the post-2020 period, LLMs, especially models such as ChatGPT, have spread rapidly and attracted increasing attention in educational sciences. It is understood that LLMs are used extensively in areas such as personalized learning, programming education, feedback processes and assessment, especially in the higher education context. It has also been found that AI and LLM-based tools offer innovative solutions in areas such as instructional design, peer assessment and professional development. The opportunities offered by LLMs in education can increase the quality and interaction in teaching processes; however, these technologies should be used consciously and in a balanced manner.

Keywords: *Large language models, educational sciences, trend analysis, LLMs*

1. Introduction

In recent years, large language models (LLMs) have made significant advancements in the fields of artificial intelligence and natural language processing. Particularly through the combination of deep learning-based transformer architectures and large-scale training data, LLMs have reached a near-human capacity for text generation and comprehension (Coleho & Reis, 2025). Today, LLMs have become general-purpose models capable of generating coherent and contextually appropriate text on nearly any topic based on task instructions after pretraining on vast corpora (Kasneci et al., 2023; Peláez-Sánchez et al., 2024). The versatile capabilities of these models in understanding and producing language have created a new paradigm in AI research, opening broad application areas in both academia and other sectors.

The field of educational sciences is also rapidly being influenced by these developments. The use of AI applications in education has gained momentum, particularly during the COVID-19 pandemic, leading to a marked increase in recent years (Nawaz, Gomes & Saldeen, 2020). Higher education institutions have begun integrating AI-supported digital tools into instructional processes to address the remote learning needs that emerged during the pandemic (Bearman, Ryan & Ajjawi, 2023). GPT-based LLMs have gained prominence in the field of education. Both students and instructors in higher education are using advanced language models such as ChatGPT for various purposes. For instance, LLM-based chatbots are being utilized as interactive learning assistants capable of explaining complex concepts in simplified language (Kasneci et al., 2023). Similarly, there is growing interest in the potential of these models to support academic writing. Studies have shown that LLMs like ChatGPT can assist students in drafting texts, correcting grammar, and generating alternative ideas (Imran & Almusharraf, 2023). In the context of foreign language education, LLMs are seen as promising tools for enhancing students' writing skills by providing timely and personalized feedback (Kasneci et al., 2023). LLMs are also being tested in examination and assessment processes, such as automatic scoring of open-ended responses and generation of personalized practice questions (Munoz et al., 2021). In instructional design, AI support can offer considerable time savings and efficiency in tasks like creating, summarizing, or adapting course content to different levels (Kasneci et al., 2023). Consequently, due to their potential to offer personalized learning experiences, LLMs are considered innovative tools that can enhance student engagement and motivation in higher education (Peláez-Sánchez et al., 2024).

While LLMs present significant opportunities in higher education, they also pose certain challenges that should not be overlooked. In terms of potential benefits, LLMs are believed to contribute significantly to supporting student learning, enriching instructional processes, and enhancing the quality of higher education. For example, the ability of these models to provide instant and personalized feedback can improve both the speed and quality of learning (Zhu et al., 2023). LLMs can also create adaptive learning environments by offering guidance tailored to the individual needs of each student, thereby supporting the personalization of learning, especially in large classes. Another key opportunity is their potential to support inclusive learning environments. For students with learning difficulties or special needs, LLM-based tools can clarify complex information and provide responsive feedback when needed (Feng et al., 2023). Furthermore, they can assist academic staff by automating routine tasks, thus allowing more time for creative and higher-order responsibilities. For example, the automatic generation of frequently used exam questions or the summarization of course materials can enable instructors to focus on more complex instructional strategies (Kasneci et al., 2023). These opportunities foster positive expectations that LLMs can contribute to building a more flexible, interactive, and student-centered educational ecosystem aligned with the vision of Education 4.0 (Peláez-Sánchez et al., 2024).

The rapidly evolving nature of this field has drawn the attention of educators and researchers, while also raising certain concerns. Since the emergence of LLMs after 2020, there has been a

significant increase in academic publications addressing the role of AI in education. For instance, the impact of LLMs in educational contexts has been examined from various perspectives (Imran & Almusharraf, 2023). However, this rapid growth makes it difficult to obtain a comprehensive overview of the existing literature (Naveed et al., 2023). As this is still a relatively new research area, a trend analysis is required to develop an integrative perspective across diverse findings and viewpoints. The need for such an approach is emphasized in the literature, with systematic reviews and framework studies on the use of LLMs being increasingly published (Peláez-Sánchez et al., 2024). In particular, analyzing the research published since 2020 to identify common trends, gaps, and future directions will make a valuable contribution to the academic discourse. Therefore, this article aims to analyze the trends in the use of LLMs in educational sciences by examining academic publications released globally after 2020.

In this context, although LLMs hold significant potential in the field of educational sciences, their effective integration requires careful planning. Based on the trend analysis of academic studies published after 2020, this article seeks to synthesize current research and evaluate the role of LLMs in higher education from a broad perspective. Considering the background presented in this introduction, recent studies on the use of LLMs in education will be systematically reviewed, and the findings will be discussed. Ultimately, this study aims to offer a comprehensive and inclusive perspective on current literature and provide guidance for future research efforts in the field. Accordingly, the following research questions will be addressed.

1. What is the distribution of studies on large language models by year?
2. What is the distribution of these studies by the journals in which they were published?
3. What is the frequency distribution of the most repeated keywords?
4. What are the five-year trends of the most frequent keywords?
5. How are the keywords clustered based on frequency and semantic similarity?

2. Methodology

The aim of this study is to conduct a trend analysis of research on large language models within the field of educational sciences. Since the study focuses on examining research trends concerning large language models in educational sciences, the unit of analysis has been defined as individual articles centered on large language models. The Web of Science database, a widely used and reliable source in literature reviews, was selected as the primary data source for identifying the target articles. The search was limited to studies with relevant terms in their titles or keywords. Accordingly, a search was conducted in the Web of Science database using the keywords “large language models” and “LLMs.” The search string applied for the study was as follows: (“large language models” OR “LLMs” OR “large language model”) AND (“educa***” OR “teach***”). These keywords formed the search protocol to identify literature related to large language models in the field of educational sciences. The search process was finalized on March

1, 2025. In the selection of relevant articles, inclusion and exclusion criteria were determined according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines proposed by Page et al. (2021) for systematic literature reviews (see Table 1). A rigorous selection process was subsequently conducted in three stages: identification, screening, and inclusion. This systematic approach ensured a comprehensive and methodologically robust selection of articles that aligned with the research objectives.

Table 1. *Inclusion and exclusion criteria*

Inclusion Criteria
Published in an academic journal
In English
Availability of full text
In the field of educational sciences
Exclusion Criteria
Proceedings, meeting abstracts, editorial materials

Following the inclusion and exclusion criteria specified in the table, a total of 131 studies were identified and included in the analysis. The details of the query and selection processes are presented in Table 2. For the analysis, a reliable and validated software tool, WOSviewer, was used (Van Eck & Waltman, 2014).

Table 2. *PRISMA chart*

Identification	Screening	Included
Articles identified of WOS	After selecting title and keywords	After inclusion and exclusion criteria
292	185	131

3. Findings

3.1. *Distribution by publication year*

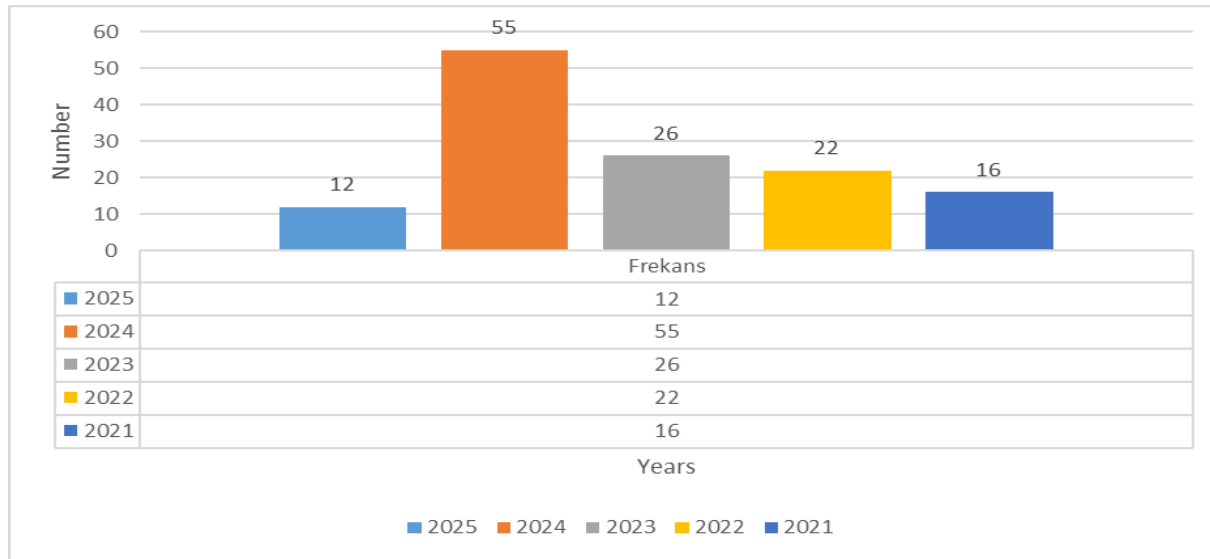


Figure 1. *Distribution by publication year*

Studies focusing on large language models in the field of educational sciences were examined, and it was observed that the majority of the research was conducted in 2024 ($n = 55$). A steady increase in the number of studies was observed from 2021 ($n = 16$) to 2024 ($n = 26$). The relatively low number of publications in 2025 is attributed to the fact that the literature search was concluded in March 2025.

Numerous studies in the literature indicate that the application of large language models (LLMs) in educational sciences has rapidly increased in recent years. It is particularly noteworthy that since 2021, LLMs have been intensively utilized and investigated within the field of education (Dong et al., 2024). Another study also emphasizes that a substantial number of publications related to the educational applications of LLMs were released in 2024, marking a more prominent increase compared to previous years (Wang et al., 2024). The rapid advancement of LLMs' natural language processing and generation capabilities—especially with the emergence of models such as ChatGPT—has paved the way for innovative practices in education. This development has led to growing interest in personalized learning, intelligent teaching, and assessment systems in educational settings (Wu et al., 2023). Additionally, LLMs offer new opportunities in areas such as providing individual feedback to students, creating interactive instructional materials, and supporting academic writing (Wang et al., 2024). These advancements have significantly increased the interest of educational researchers in such technologies.

3.2. *Distribution by journals*

Table 3. *Distribution by journals*

Journal	f

Education and Information Technologies	8
Frontiers in Education	7
IEEE Transactions on Learning Technologies	6
Journal of Computer Assisted Learning	6
Thinking Skills and Creativity	6
British Journal of Educational Technology	5
Physical Review Physics Education Research	4
Aera Open	3
Interactive Learning Environments	3
Online Learning	3
Tesol Journal	3
Computers & Education	2
ETR&D	2
International Journal of Serious Games	2
Journal of Chemical Education	2
Science Education	2
System	2
Techtrends	2
Other	64

An analysis of the journals in which the studies were published revealed that Education and Information Technologies had the highest number of articles on the topic ($n = 8$). It was followed by Frontiers in Education, which published 7 studies. IEEE Transactions on Learning Technologies, the Journal of Computer Assisted Learning, and Thinking Skills and Creativity each hosted 6 publications, making them among the most frequent outlets for LLM-related research.

The British Journal of Educational Technology (BJET) followed closely with 5 publications. The fact that journals such as E&IT, BJET, JCAL, and TSC have high impact factors plays a significant role in attracting researchers to submit their work to these outlets. This aligns with the intentions of scholars working on a rapidly evolving and prominent topic like LLMs to

disseminate their findings to broad academic audiences. Each of these journals holds a distinct position at the intersection of educational technology and pedagogical research. Given the inherently technical and pedagogical dimensions of LLM research, it is unsurprising that publication rates are higher in such venues.

Another common feature of the analyzed journals is their ability to respond quickly to emerging trends—often through special issues that explore these developments in depth. Since 2020, with the widespread influence of generative artificial intelligence across disciplines, these journals appear to have prioritized articles focusing on large language models.

3.3. Trend Analysis by Most Recurring Keywords

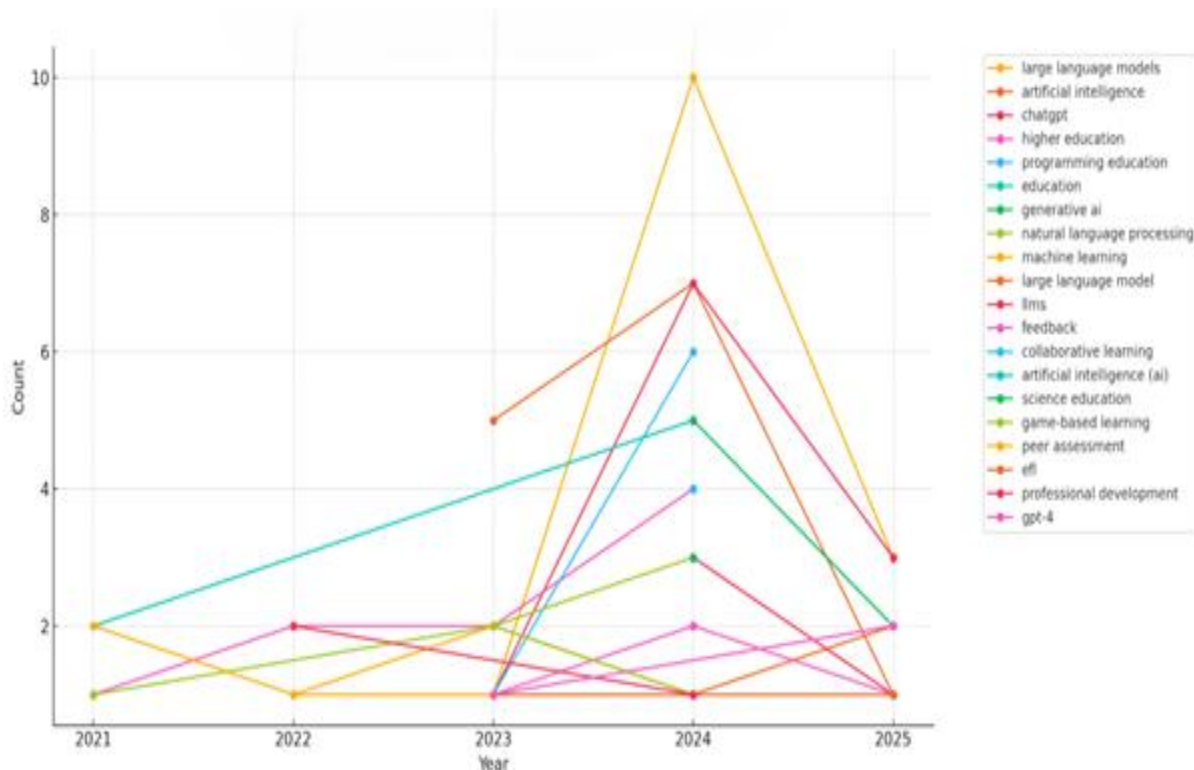


Figure 2. Trend Analysis by Most Recurring Keywords

In the trend analysis conducted based on the most frequently recurring keywords in studies related to LLMs, the most prominent concepts were large language models, artificial intelligence, ChatGPT, higher education, programming education, generative AI, machine learning, feedback, collaborative learning, peer assessment, English as a foreign language, and professional development. The frequent appearance of terms such as large language models, artificial intelligence, and ChatGPT is an expected outcome given the focus of the studies. Beyond these, the notable occurrence of the keyword higher education indicates that most of the research has been conducted at the tertiary education level. Another keyword that stands out is programming education, suggesting that the integration of large language models into programming instruction has become increasingly common. Moreover, the frequent use of terms like feedback and peer assessment points to a research emphasis on evaluation-related themes. These keywords imply that a significant portion of the studies centers on how LLMs can support or transform assessment processes in educational contexts.

3.4. Distribution of the most recurrent keywords

The keywords of the studies were examined and keywords that were repeated more than 3 times were included in the table.

Table 4. *Distribution of the most recurrent keywords*

Theme	Keyword	f
AI and technology	Large language models	23
	Artificial intelligence	16
	Chatgpt	11
	Generative AI	7
	Machine learning	6
	Natural language processing	6
	Gpt-4	3
	Sub-total	72
Education and training	Higher education	9

	Programming education	7
	Education	7
	Divergent thinking	3
	EFL	3
	Flipped classroom	3
	Game-based learning	3
	Online learning	3
	Science education	3
	Sub-total	45
Assessment and Evaluation	Feedback	4
	Peer assessment	3
	Sub-total	7
Professional development	Professional development	3
	Sub-total	3
Total		172

An analysis of the keywords used in the reviewed studies revealed that they could be grouped under four main categories: artificial intelligence and technology, education and instruction, assessment, and professional development. Among these, the artificial intelligence theme was found to contain the largest number of keywords. The use of AI in education offers various benefits, such as personalized learning, increased efficiency, and improved student achievement (Zhai et al., 2021). The emergence of generative AI systems such as GPT-4, OpenAssistant, and DALL·E has significantly influenced how students access information and engage in learning (Walczak & Cellary, 2023). The growing adoption of these tools in educational contexts highlights the importance of this theme. Thanks to their advanced language capabilities, LLM-based tools can perform a wide range of tasks—such as content generation, question answering, and summarization—and are regarded as valuable resources by educators (Li et al., 2023).

One of the domains where LLMs have shown a particularly strong impact is software and programming education. LLM-based tools such as OpenAI's Codex or GitHub Copilot have introduced new learning opportunities in teaching skills such as coding, debugging, and algorithm development. These models can translate natural language input into executable code or analyze students' code and suggest intelligent completions where needed. For students learning

to program, this creates a kind of “intelligent pair programming” experience. Comparative studies have demonstrated that advanced LLMs can produce solutions to certain fundamental algorithmic problems with accuracy and efficiency compared to that of human learners (Roberts et al., 2024).

As an alternative to traditional teaching methods, game-based learning integrates game elements into education to enhance student motivation and engagement. In recent years, LLMs have enabled innovative applications in this area. The use of LLMs within educational games allows for real-time enrichment of game scenarios and interactions, thus offering more personalized and dynamic learning experiences.

Assessment and evaluation processes in education are critical for monitoring and guiding student learning. Recently, LLMs have begun to enable innovative applications in this domain as well. These include providing real-time feedback on students’ work, supporting peer assessment practices, and automating the evaluation of exams and assignments. LLMs are capable not only of delivering feedback from teachers to students, but also of supporting peer assessment processes. Peer assessment involves students evaluating and commenting on each other’s work, which is effective in developing critical thinking and self-evaluation skills. Generative models like GPT have also been proposed as tools to automatically assess the usefulness of peer feedback (Liu et al., 2024).

3.5. Clustering analysis of keywords

In this study, the identified keywords were clustered based on their frequency of use and semantic similarity. The objective was to detect groups of semantically related terms and to assign a common theme to each cluster. The process involved is outlined step by step below, including the method used, the determination of the optimal number of clusters, and the visualization and interpretation of the resulting clusters.

The table below presents the six identified clusters along with the common themes assigned to each and a selection of representative example keywords from each cluster. These clusters represent semantically coherent groups, with each one organized around a distinct topic or theme.

Table 5. *Clustering analysis of keywords*

Cluster	Theme	Sample Keywords
1	Artificial Intelligence and Large Language Models	ChatGPT, Large Language Models, Generative AI, Neural Networks
2	Learning Methods and Environments	Flipped Classroom, Online Learning, Game-Based Learning, Higher Education
3	Computer and Programming Education	Programming Education, Introductory Programming, Programming Profession

4	Assessment and Feedback	Assessment, Peer Feedback, Formative Assessment, Autograding
5	Creativity and Innovative Thinking	Creativity, Divergent Thinking, Alternative Uses Test
6	Students, Teachers, and Individual Factors	Motivation, Self-Efficacy, Professional Development, Equity

As shown in the table above, each cluster reflects a specific thematic area. Cluster 1 (Artificial Intelligence and Large Language Models) includes AI-related terms such as ChatGPT, large language models, and generative AI. Cluster 2 (Learning Methods and Environments) brings together terms related to instructional methods, learning environments, and educational settings such as online learning, flipped classroom, game-based learning, and higher education. Cluster 3 (Computer and Programming Education) comprises concepts specific to programming instruction and computer science education (e.g., introductory programming). Cluster 4 (Assessment and Feedback) contains terms related to evaluation, testing, and feedback for example, exam assessment, peer feedback, and automated grading are representative keywords in this cluster. Cluster 5 (Creativity and Innovative Thinking) includes keywords associated with the measurement and encouragement of creativity, such as creativity and divergent thinking. Finally, Cluster 6 (Students, Teachers, and Individual Factors) encompasses individual factors related to learners and educators, such as motivation, self-efficacy, teacher professional development, and equity in education.

4. Conclusions and Recommendations

This study analyzed academic trends related to large language models (LLMs) in the field of educational sciences, highlighting the potential applications of LLMs in higher education and identifying prominent themes in literature. The findings indicate that, particularly after 2020, LLMs especially models like ChatGPT—have rapidly proliferated and attracted growing interest in educational research (Kasneci et al., 2023; Peláez-Sánchez et al., 2024). LLMs appear to be extensively utilized in areas such as personalized learning, programming education, feedback processes, and assessment, especially within the context of higher education (Kasneci et al., 2023; Zhu et al., 2023). Furthermore, AI and LLM-based tools have been found to offer innovative solutions in fields such as instructional design, peer assessment, and professional development (Peláez-Sánchez et al., 2024).

However, alongside the opportunities offered by LLMs, literature also emphasizes several challenges particularly in relation to academic integrity, information accuracy, and pedagogical integration (Murugesan & Cherukuri, 2023; Lee et al., 2024). Concerns have been raised regarding the reliability of LLM-generated content, the risk of bias replication, and the potential for misuse of AI-generated materials (Kasneci et al., 2023). Educators are encouraged to consider not only the benefits of these technologies but also the ethical and pedagogical implications of

their use. While LLMs can enhance the quality and interactivity of instructional processes, their adoption must be conscious and balanced to ensure responsible integration into educational environments.

5. Recommendations

Digital competency training for educators should be enhanced to ensure that teachers can use LLM-based tools effectively and ethically, and their adoption should be actively encouraged.

Institutional policies should be developed to guide the integration of LLMs into education—particularly through the establishment of clear protocols on data privacy and academic integrity.

Critical digital literacy skills should be promoted among students, enabling them to critically evaluate content generated by LLMs and to engage with such technologies in an informed manner.

The use of LLM-based tools in assessment processes should be carefully planned; further research is needed on the benefits of AI-supported applications in areas such as feedback provision and peer assessment.

Future studies should conduct comparative analyses of the impact of LLMs across various disciplines, and special attention should be paid to exploring their potential and limitations at the K–12 education level.

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Teacher Perceptions of 2024 Education Model: Values and Reflections of Digitalization

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Abstract

The aim of this study is to determine how teachers evaluate the 2024 Turkish Century Education Model curriculum and to identify its strengths and weaknesses. There are gaps in the existing literature on whether teachers' views are sufficiently taken into account in the development of educational programs and how the classroom applicability of new programs is perceived. This study fills this gap by revealing teachers' opinions about the 2024 curriculum and evaluating the innovations brought by this curriculum to our education system. The research was conducted using qualitative study method. A semi-structured interview form was used as a data collection tool. A total of 25 teachers from different branches participated in the study. According to the findings of the study, 84% of the teachers thought that their opinions were sufficiently included in the development process of the new curriculum. In terms of values and moral education, teachers stated that the curriculum was comprehensive and effective, but that the lack of materials and overcrowded classrooms posed implementation difficulties. In terms of technology and digital tools, 82% of the teachers stated that they had sufficient knowledge and skills, while 18% felt that they felt inadequate, especially among experienced teachers.

Keywords: *2024 Education Model, Values Education, Technology Integration, Teacher Perceptions*

1. Introduction

Curricula are documents that systematically organize the knowledge, skills, attitudes and values aimed to be acquired by students at a certain educational level. These programs provide guidance in teaching processes and ensure that education is carried out in a planned manner (MoNE, 2013; Özdemir, 2009). Moreover, curricula cover not only the subjects taught, but also how these subjects will be taught, the role of the teacher, assessment methods, and the educational environment (OECD, 2020; SAGE Publications, 2020; Scott, 2001).

The main objectives of curricula serve both individual and social development. While individual development aims to support students' mental, emotional, social and physical development (MoNE, 2013; Alsubaie, 2016), social development aims to raise individuals who will contribute to the cultural, economic and social development of society (Özdemir, 2009; Banks, 1993). Moreover, academic achievement aims to provide students with academic knowledge and skills (MoNE, 2006; Dillon, 2009) and values education aims to provide students with national, spiritual and universal values (Tuğluk & Özkan, 2019; Fullan, 1991).

The development of curricula has been influenced by various educational theories, social changes and cultural contexts. The foundations of modern curricula in the Ottoman Empire were laid in the Tanzimat Period. With the educational reforms in this period, more systematic and comprehensive curricula were started to be created by taking Western education systems as an example (Şahin, 2006). With the proclamation of the Republic, a modern education system based on secular and scientific foundations was established between 1923 and 1950, curricula gained a centralized structure and were reorganized to reinforce national unity (MEB, 2002). Between 1950 and 1980, more pragmatic and technical education approaches were adopted and the programs prepared in 1968 aimed to provide students with more vocational skills (Oktay, 1985). After the 1980 military coup, the restructuring process in education started and the 8-year uninterrupted education system was put into practice in 1997 (Sapsağlam, 2013).

In the 2000s, with the 2005 Curriculum Reform, the constructivist education approach was adopted and the programs were reorganized as student-centered. In this period, curricula were aimed to be flexible and modular (Polat, 2020). In 2013, pre-school, primary and secondary school curricula were updated again, and in 2018, a new Turkish Curriculum was introduced at all levels. In these programs, student-centered and active learning methods were emphasized (MoNE, 2013; Sapsağlam, 2016). Finally, the curricula were restructured with a more holistic and values-based approach with the Turkish Century Education Model, which will be implemented in 2024. In this model, interdisciplinary learning, the development of social-emotional skills and the acquisition of competencies appropriate to the needs of the digital age are prioritized (MoNE, 2024).

Before the 2024 Turkish Century Education Model came into force, the curricula implemented had various shortcomings and problems. These shortcomings can be listed as follows in the light of academic publications: Existing curricula could not adequately respond to contemporary educational needs and global developments. There were inadequate regulations especially on digital literacy, media literacy and access to information (Güven & Alan, 2020; İnal, 2009). The programs were insufficient in providing students with social and emotional skills. The lack of sufficient coverage of issues such as morality and value education prevented students from developing a sense of social responsibility (Meydan & Bahçe, 2010; Pamuk & Pamuk, 2016). Teachers and other educational stakeholders were not sufficiently involved in the process of developing education programs. This situation caused various difficulties in the implementation phase of the programs (Mikayilova & Kazimzade, 2016; Saban & Ersoy, 2019). Adequate

feedback and evaluation mechanisms were not established during the implementation process of the existing programs. This reduced the effectiveness of the programs and failed to respond to the real learning needs of students (Karabulut, 2019; Oker & Tay, 2019). In addition, the programs did not include sufficient regulations on the effective use of technology in education. This situation prevented students from acquiring skills appropriate to the needs of the digital age (Keskin, 2017; OECD, 2021)

In this context, the aim of the study is to examine in depth the differences of the 2024 Turkish Century Education Model curriculum from the existing programs, its applicability, its strengths and weaknesses in terms of content, and its effects on values education according to teachers' perceptions. This study aims to determine the effectiveness of the program and the areas that need to be improved by revealing teachers' experiences and opinions about the new program. Qualitative methods will be used in the study and semi-structured interview forms will be preferred as data collection tools. Interviews with 25 teachers will provide important contributions to the evaluation of various dimensions of the new curriculum.

2. Method

This research was conducted using semi-structured interview technique, one of the qualitative research methods. Qualitative research method is used to understand complex social phenomena and to examine participants' experiences in depth (Creswell, 2013). The semi-structured interview form has a flexible structure that allows both getting answers to specific questions and allowing participants to express their own thoughts freely.

The population of the study consists of teachers from different branches working in secondary schools in Yenışehir district of Mersin province. The sample of the study was determined using random sampling method and 25 teachers were selected on the basis of volunteerism. Random sampling is a method in which each individual has an equal probability of being selected and therefore has high generalizability (Patton, 2002).

A semi-structured interview form was used as a data collection tool. The interview form was developed in line with the opinions and suggestions of four academicians who are experts in their fields. The form includes four open-ended and three yes/no questions that aim to reveal teachers' views and experiences regarding the 2024 Turkish Century Education Model curriculum:

- 1) How do you evaluate the differences of this program from the current curriculum?
- 2) What do you think about the applicability of the 2024 curriculum? Do you think this curriculum can be implemented effectively in the classroom environment?
- 3) What are the strengths and weaknesses of the new curriculum in terms of content?
- 4) What are your thoughts about values and moral education in the 2024 curriculum?
- 5) Did you receive adequate information and training about the 2024 curriculum? (Yes/No)

6) Do you have sufficient knowledge and skills about the use of technology and digital tools in the new curriculum? (Yes/No)

7) Do you think that teachers' opinions were sufficiently included in the development process of the 2024 curriculum? (Yes/No)

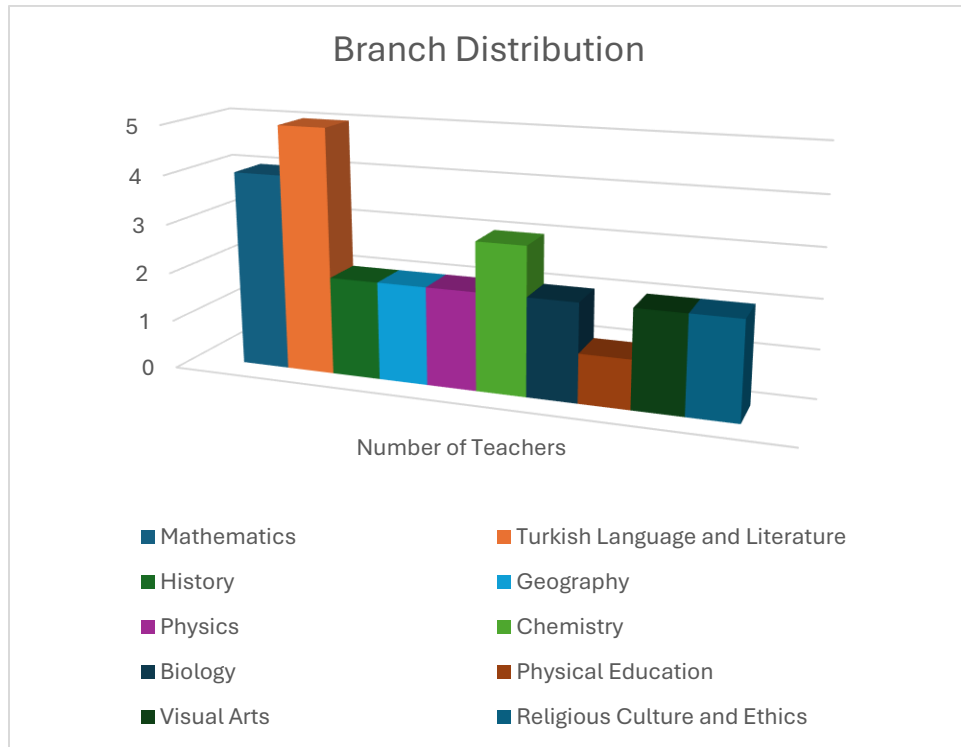
The data collection process was carried out by the researcher through one-to-one interviews with the participants. The interviews were conducted in a quiet and appropriate environment so that the participants could express their thoughts comfortably. Each interview lasted approximately 30-45 minutes. The interviews were audio recorded and then transcribed.

The collected data were analyzed by content analysis method. Content analysis enables the systematic coding of texts to reveal certain themes and patterns (Miles & Huberman, 1994). First, interview transcripts were read and specific codes were identified. These codes were then combined under themes with similar characteristics. During the analysis process, in order to increase the validity and reliability of the data, coding and theme identification processes were carried out by two independent researchers.

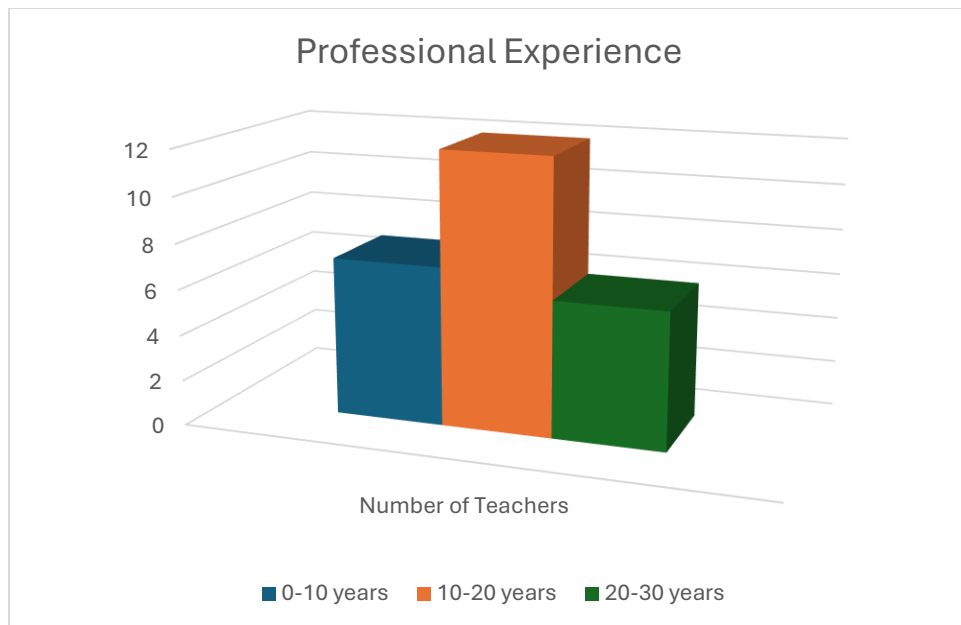
During the research process, voluntary participation of the participants was ensured and written consent was obtained from the participants. The identities of the participants were kept confidential and the data obtained were used only for the purpose of this research. The research was conducted by respecting ethical rules and the rights of the participants (APA, 2010).

The results of the research will reveal teachers' perceptions of the 2024 Turkish Century Education Model curriculum and how these perceptions are shaped in various dimensions such as the applicability of the curriculum, content, values education and technological integration. The findings will contribute to identifying the strengths and weaknesses of the curriculum and developing recommendations for future educational reforms.

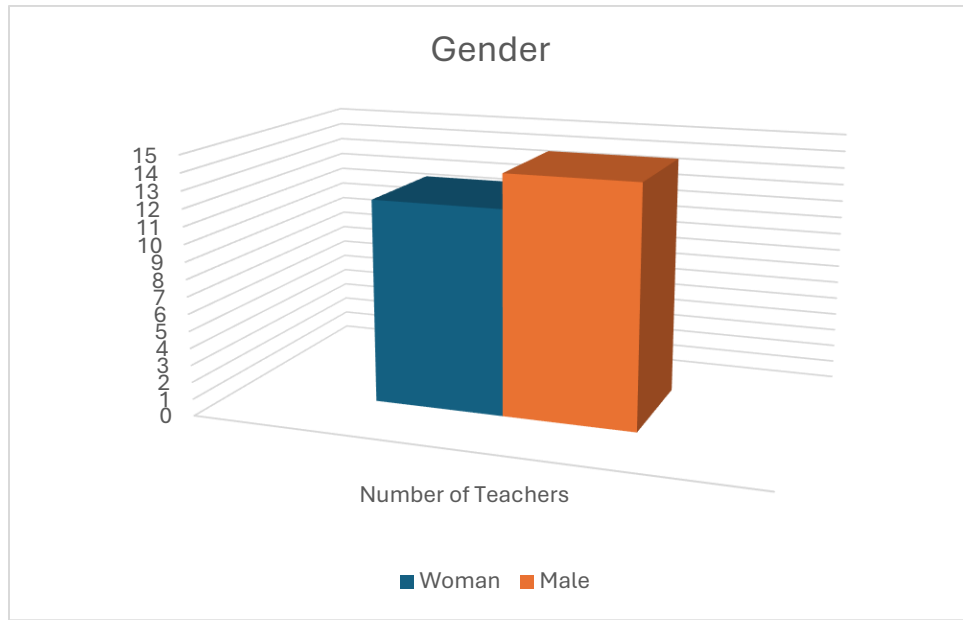
A total of 25 teachers from different branches working in Yenişehir district of Mersin province participated in the study. These teachers consisted of 4 mathematics, 5 Turkish Language and Literature, 2 history, 2 geography, 2 physics, 3 chemistry, 2 biology, 1 physical education, 2 visual arts and 2 religious culture and ethics.



When the professional experience of the teachers was analyzed, it was found that 7 teachers had 0-10 years of experience, 12 teachers had 10-20 years of experience and 6 teachers had 20-30 years of experience.



When the gender distribution of the participants is analyzed, it is seen that there are 12 female and 14 male teachers.



This diversity enables the study to comprehensively reflect the views of teachers from different branches and experience levels. The demographic and professional diversity of teachers will contribute to the study's ability to provide a broader and more balanced perspective on the overall education system and the 2024 Turkish Century Maarif Model curriculum.

3. Findings

Table 1. *Frequency distribution for the question "How do you evaluate the differences of this curriculum from the current curriculum?"*

Main Category	Theme	Frequency
Student Centeredness and Educational Approaches	The new curriculum emphasizes more the student-centered approach. This encourages more active student participation.	3
	The 2024 program is more flexible and adaptable based on student and teacher feedback.	2
	Compared to the old curriculum, the new curriculum encourages more student-centered activities and participation.	2
Technology and	The 2024 program puts more emphasis on technology	5

Digital Integration	integration, but some teachers do not have enough knowledge about it.	
	The new program offers more up-to-date content on digital literacy and access to information.	4
Values and Moral Education	Values education is more explicit in the new program. This is important to support students' moral development.	3
	The new program places more emphasis on instilling social and moral values in students.	2
Academic and Skills Development	The existing program was more knowledge-oriented, while the new program focuses on skills and competency development.	6
	The new program aims to develop students' creative thinking skills by supporting project and activity-based learning.	4
	The old program was based more on rote learning, while the new program encourages problem solving and analytical thinking skills.	5

Most of the teachers stated that the new curriculum emphasizes student-centered approaches more. For example, Teacher 1 said, "The new curriculum emphasizes the student-centered approach more. This encourages more active participation of students". In addition, the fact that the curriculum has a flexible and adaptable structure based on student and teacher feedback emerged as an important theme in this category. Technology integration is seen as an important part of the new curriculum. Teacher 2 expressed her concerns about this issue by saying, "The 2024 program gives more importance to technology integration, but some teachers do not have enough information about it." Updates on digital literacy and access to information were also emphasized. Values education has become more prominent in the new program. Teacher 3 said, "Values education is more prominent in the new program. This is important in terms of supporting students' moral development". The importance given to the acquisition of social and moral values also stands out in this category. The new curriculum's focus on the balance of knowledge and skills, its support for project and activity-based learning, and its encouragement of problem solving and analytical thinking skills were considered important developments by teachers. For example, Teacher 18 emphasized this difference by saying, "The old curriculum was based more on rote learning, while the new curriculum encourages problem solving and analytical thinking skills."

Table 2. *Frequency distribution for the question "What do you think about the applicability of the 2024 curriculum? Do you think this curriculum can be implemented effectively in the classroom?"*

Main Category	Theme	Frequency
Student	Student Engagement and Active Learning	12

Centeredness and Educational Approaches		
	Flexibility and Feedback	9
Technology and Digital Integration	Technology Use	2
	Digital Literacy	4
	Morality and Value Education	4
Values and Moral Education		
	Social-Emotional Development	2
Academic and Skills Development	Knowledge and Skills Balance	6
	Project and Activity Based Learning	4
	Crowded Classrooms	5
Implementation Challenges		
	Lack of Material	3
	Teacher Training	9

Most of the teachers stated that the new curriculum encourages student-centered approaches and active learning. For example, Teacher 1 said, "The new curriculum emphasizes the student-centered approach more. This encourages more active participation of students". In addition, the flexible structure of the curriculum and the fact that it is based on feedback were positively received by the teachers. Teacher 10 stated, "The 2024 program has a more flexible and adaptable structure based on student and teacher feedback." Technology integration and digital literacy are seen as important elements of the new program. Teacher 2 expressed her concerns by saying, "The 2024 program gives more importance to technology integration, but some teachers do not have enough knowledge on this issue". Teacher 8 stated, "The new program offers more up-to-date content on digital literacy and access to information". Values and moral education have become prominent in the new program. Teacher 3 stated, "Values education is more prominent in the new program. This is important in terms of supporting students' moral development". Social-emotional development is also an important part of the program. Teacher 11 stated, "The program supports social-emotional development". The new curriculum's focus on the balance of knowledge and skills and its support for project and activity-based learning were evaluated by teachers as important developments. Teacher 4 emphasized this difference by saying, "The current curriculum was more knowledge-oriented, while the new curriculum focuses on skills and competency development." Teacher 13 stated, "The new program aims to develop students' creative thinking skills by supporting project and activity-based learning." Some teachers expressed concerns about the applicability of the program. Crowded classrooms, lack of materials

and inadequate teacher training are the main challenges. Teacher 16 said, "I have concerns about the applicability of this program in crowded classrooms. It may be difficult to give enough individual attention to each student". Teacher 17 stated, "Material deficiencies may prevent the effective implementation of the program". In addition, Teacher 18 stated that teachers did not receive adequate training to adapt to the new curriculum and said, "Teachers did not receive adequate training to adapt to the new curriculum".

Table 3. *Frequency distribution for the question "What are the strengths and weaknesses of the new curriculum in terms of content?"*

Main Category	Theme	Frequency
Critical and Creative Thinking	Critical Thinking	11
	Creative Thinking	6
Interdisciplinary and Real Life Connections	Interdisciplinary Approach	8
	Real Life Connection	8
Social and Emotional Development	Social-Emotional Development	9
	Values and Moral Education	14
Technology and Digital Content	Digital Literacy	7
	Technological Infrastructure Deficiencies	9
Teaching Materials and Resources	Resources and Support Materials	12
	Lack of Material	10
Teacher Preparation and Workload	Teacher Training	18
	Workload	14

The fact that the curriculum develops critical and creative thinking skills was stated as a positive feature by the teachers. For example, Teacher 1 stated, "The strongest aspect of the new curriculum in terms of content is that it includes activities aimed at developing students' critical thinking skills." Similarly, Teacher 6 stated, "The new curriculum aims to develop students' creative thinking skills through student-centered activities and project-based learning." Interdisciplinary approaches and the fact that the curriculum offers content related to current and real life were emphasized as important strengths. Teacher 2 stated that "The program encourages interdisciplinary approaches and enables students to gain broader perspectives". Teacher 8 stated, "The program provides students with content that is more current and relevant to real life". Teachers emphasized that the curriculum supports social-emotional development and the

importance of values education. Teacher 3 said, "The inclusion of content that supports students' social-emotional development in the program is very useful for students." Teacher 7 stated, "The importance given to values education and moral education increases students' awareness of social responsibility." While the updated contents on digital literacy and access to information were evaluated positively, the lack of technological infrastructure was mentioned as a negative aspect. Teacher 4 stated, "Updated content on digital literacy and access to information enables students to acquire skills appropriate to the needs of the age". However, Teacher 19 emphasized this deficiency by saying, "Infrastructure deficiencies in schools prevent the effective use of technology". While the fact that the program provides a wide range of resources and support materials was mentioned as a positive aspect, some teachers complained about the lack of materials. Teacher 12 said, "The fact that the program provides a wide range of resources and support materials makes it easier for teachers to implement." On the other hand, Teacher 17 stated, "Lack of teaching materials may prevent the program from achieving its goals." Teachers' lack of adequate training and the program's increasing workload were mentioned as weaknesses. Teacher 18 said, "Teachers have not received enough training so far to adapt to the new curriculum". Teacher 22 said, "The new program requires more preparation from teachers. However, since teachers' workload is already high, this may be challenging".

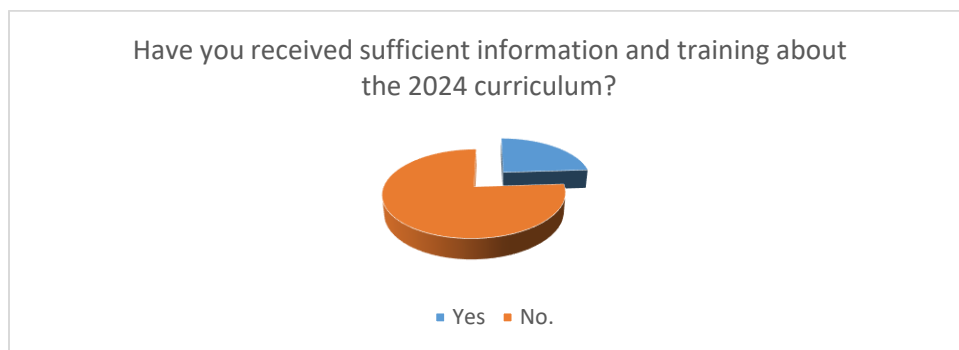
Table 4. *Frequency distribution of the question "What are your thoughts on values and moral education in the 2024 curriculum?"*

Main Category	Theme	Frequency
Quality of Program Content and Implementation	Scope and Depth	14
	Universal and National Values	9
	Ethical Decision Making	8
Student Development and Social Skills	Social Responsibility	18
	Empathy and Respect	14
	Social Skill Development	18
Implementation Challenges and Infrastructure Deficiencies	Lack of Materials and Support	10
	Time and Intensity	11
	Crowded Classrooms	16
Teacher Training and Family Engagement	Teacher Training	8
	Family Engagement	9
	Application Methods	12

The quality of the content and implementation of the curriculum was emphasized by teachers as an important strength. Teacher 1 said, "The new program provides an excellent opportunity to

strengthen students' national and spiritual values. Values education has become much more comprehensive". Similarly, Teacher 6 stated, "The new curriculum includes activities to strengthen students' ability to make ethical decisions". The program's inclusion of universal and national values was also viewed positively. Teacher 4 said, "The program increases students' cultural awareness because it includes our national values as well as universal values." Teachers stated that the program increases students' awareness of social responsibility, improves their ability to empathize and respect, and supports their social skills as a positive feature. Teacher 2 said, "The inclusion of moral education in the program will increase students' awareness of social responsibility." Teacher 5 stated, "Moral education will improve students' ability to empathize and respect different perspectives." Social skills development also stands out as an important theme. Teacher 7 said, "Values education will improve students' social skills and help them better integrate with society." Some teachers drew attention to the implementation difficulties and infrastructure deficiencies of the program. Teacher 16 said, "Values education is well thought out, but teachers may not find sufficient materials and support during the implementation phase of the program." Difficulties in terms of time and intensity were also mentioned. Teacher 18 said, "The program does not allocate enough time for values education. This may cause the subject to remain superficial". Crowded classes are also among the implementation difficulties. Teacher 19 said, "Crowded classrooms make it difficult to implement the program effectively." Teacher training and family involvement were also mentioned as weaknesses. Teacher 17 said, "Moral education is important, but the fact that teachers do not receive adequate training and guidance on this subject may cause problems in practice." Drawing attention to the importance of family participation, Teacher 21 said, "For values education to be effective, families should be included in the process, otherwise it may not be enough alone." The need to make the implementation methods interactive and practical was also mentioned. Teacher 22 said, "Values education should be made more interactive and practical to attract students' attention."

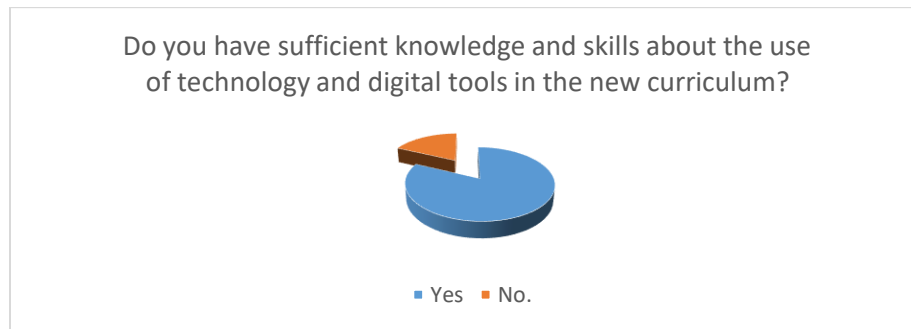
Have you received sufficient information and training about the 2024 curriculum?



As seen in the graph, 76% of the teachers stated that they did not receive sufficient information and training about the 2024 curriculum. Only 24% stated that they received adequate information and training. This shows that teacher trainings have not yet started and there is a serious deficiency in this regard. There is an urgent need for the necessary information and training to begin and for teachers to adapt to the new curriculum. The fact that teachers do not have

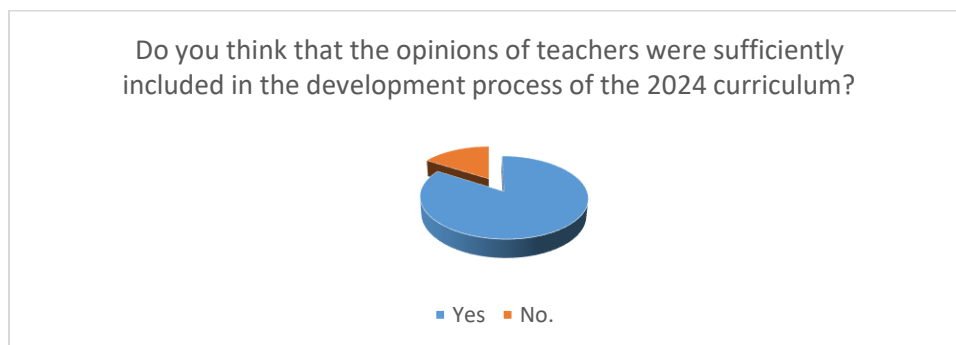
sufficient knowledge and skills about the curriculum may make it difficult to implement the curriculum effectively in the classroom environment. Therefore, it is of great importance that teacher trainings are given importance and started quickly.

Do you have sufficient knowledge and skills about the use of technology and digital tools in the new curriculum?



As seen in the graph, 82% of the teachers stated that they have sufficient knowledge and skills about the use of technology and digital tools in the new curriculum. However, 18% of them stated that they did not have sufficient knowledge and skills in this regard. All of these 18% consisted of teachers with 10-30 years of professional experience. This shows that more experienced teachers need additional training and support on technology and digital tools. Designing training programs specifically for these teachers will make it easier for them to adapt to the requirements of the new program.

Do you think that teachers' opinions were given enough space in the development process of the 2024 curriculum?



As seen in the graph, 84% of the teachers think that their opinions were sufficiently included in the development process of the 2024 curriculum. This shows that teachers' participation in the curriculum development process was high and their feedback was taken into consideration. However, 16% stated that their opinions were not sufficiently included. This indicates that some teachers may want more participation and voice in the curriculum development process. It is of great importance for the success of the program that all teachers' views are taken into consideration and included in the process.

4. Conclusion and Recommendations

This study was conducted to determine how teachers evaluate the 2024 Turkish Century Education Model curriculum. Teachers' views on the new curriculum were examined through various dimensions of the curriculum. Most of the teachers stated that the 2024 curriculum was positive in terms of values and moral education. Teachers emphasized that the curriculum would increase students' awareness of national and universal values, improve their ethical decision-making skills, and reinforce their awareness of social responsibility. One teacher said, "The importance given to values education and moral education will increase students' awareness of social responsibility". This finding is in line with the literature supporting the positive effects of values education on students' character development (Banks, 1993; Kohlberg, 1984). However, some teachers drew attention to the difficulties that could be encountered during the implementation phase. In particular, it was stated that lack of materials, insufficient teacher training and crowded classrooms would make it difficult to implement values education effectively. One teacher said, "Values education is well thought out, but teachers may not find enough materials and support in the implementation phase of the program." This finding coincides with the literature emphasizing the importance of adequate resources and support for the successful implementation of education programs (Fullan, 1991; Darling-Hammond, 2000). 82% of the teachers stated that they had sufficient knowledge and skills in the use of technology and digital tools in the new curriculum. This shows that teachers have developed digital literacy skills and that the curriculum supports technology integration. However, 18% stated that they did not have sufficient knowledge and skills in this regard. Considering that all of these teachers have between 20-30 years of professional experience, it is understood that more experienced teachers need additional training and support on technology integration. This situation supports studies emphasizing the importance of teacher training for the successful use of technology integration in education (Ertmer & Ottenbreit-Leftwich, 2010). According to the findings of the study, 84% of the teachers thought that their opinions were sufficiently included in the development process of the 2024 curriculum. This shows that teachers' participation in the curriculum development process was high and their feedback was taken into consideration. One teacher stated, "The flexible structure of the curriculum and the fact that it is based on student feedback provides more effective learning in the classroom environment". This finding is in line with the literature (Guskey, 2002) that teachers' involvement in the development of educational programs increases the applicability and success of the program. However, 16% of the participants stated that their opinions were not sufficiently included. This situation indicates that some teachers may want more participation and voice in the curriculum development process. It is of great importance for the success of the curriculum that the views of all teachers are taken into consideration and that they are included in the process. It is stated in the literature that teachers' participation in the curriculum development process has positive effects on the effectiveness of the curriculum and teachers' motivation (Hargreaves & Fullan, 2012). On the other hand, teachers are not sufficiently informed about the curriculum and the complexity of the evaluation processes limits the effectiveness of the curriculum (Güven & Yumugan, 2025). This study revealed that the 2024

curriculum was generally evaluated positively by teachers. Teachers indicated that the curriculum has strengths in areas such as values and moral education, technology integration and teacher engagement. However, it was also emphasized that there are some shortcomings in terms of difficulties that may be encountered during the implementation phase and teacher training.

Additional training and support materials should be provided to facilitate teachers' adaptation to the new program, and the necessary infrastructure and resources should be provided to increase the applicability of the program. In addition, increasing the participation of teachers in the curriculum development process and receiving their feedback on a regular basis will ensure the effectiveness and sustainability of the curriculum. In this way, it will be possible for the 2024 curriculum to achieve the targeted educational outcomes and provide students with broad perspectives.

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AI as an Ally: Transforming ELT Classrooms with ChatGPT

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Abstract

Problem Status:

Students increasingly rely on AI for quick academic solutions, posing challenges for teachers striving to maintain authentic learning.

Purpose:

To explore how AI tools, especially ChatGPT, can be used responsibly and ethically in ELT to enhance teaching and student engagement.

Method:

An interactive writing activity was implemented in an ELT classroom where students were initially asked to complete writing assignments without any AI assistance, fostering independent thinking and creativity. In the second phase, students used AI tools like ChatGPT to revise, improve, and finally convert their written work and audio files into multimedia formats such as narrated videos or animated stories. This combination of traditional writing and technological enhancement allowed students to engage with content in multilayered ways, building digital literacy alongside language skills.

Findings:

Students showed increased engagement, creativity, and understanding when combining traditional learning with AI-supported tools.

Conclusion:

AI tools, when purposefully integrated into the curriculum, can significantly enhance the learning experience without undermining the teacher's authority or pedagogical role. Instead of replacing teachers, AI serves as an extension of their instructional toolkit, encouraging more personalized and engaging learning. It helps bridge the gap between technology and traditional education, preparing students for the future learning trends.

Recommendations:

Teachers should guide students in ethical AI use, embracing technology as a partner in learning rather than a threat.

Keywords: *AI, ChatGPT, ELT, student engagement, educational technology.*

1. Introduction

The evolution of technology is bound to have an impact on various industries, and English Language Teaching (ELT) is no exception. Like many other disciplines, teaching English as a

second language has its specific challenges, such as mixed class proficiency levels and limited speaking time, which makes capturing student interest difficult. In addition, providing students with customized learning experiences is practically impossible. Tools like ChatGPT could offer personalized engagement through interaction, instant feedback, and content customization. However, the promise of generative AI also raises concerns on academic honesty, overdependence, and the shifting dynamics towards the teacher.

‘AI as an Ally: Transforming ELT Classrooms with ChatGPT’ is an official conference presentation from LET-IN 2025, where the author discussed the potential of AI in education such as its integration into classrooms to boost creativity and engagement while building responsible digital competencies. In the context of Access Scholarship Program, phase one of the intervention involved teenage students aged 13 to 16. The goal for this group was to independently complete a writing assignment employing brainstorming, peer review, and draft revision strategies centered on original idea generation.

In Phase Two, the same students employed ChatGPT to refine their drafts (correcting mechanics, clarifying and developing ideas, smoothing logic, making connections, etc.) before using AI to create multimodal outputs (narrated videos or animated stories) of their drafts. This specific order of steps allowed students to directly engage with the drafts they produced without AI assistance and compare them to AI-enhanced versions, which stimulated critical evaluation of the AI’s recommendations as well as engagement with self-reflection.

Outcomes from this intervention showed increased levels of creativity, engagement, and learner autonomy. Around seventy-five percent of the participants reported feeling more confident and enjoying the revision process more when using ChatGPT. Furthermore, teachers noticed those learners who created multimedia products exhibiting improved vocabulary, greater coherency in the narratives, and improved collaboration with peers. Most importantly, these benefits were only evident when ChatGPT was introduced as a co-facilitator alongside the students rather than a tool to do the work for them to streamline effort. By treating AI as an integrated component of lesson planning, educators are able to micromanage the students—encouraging responsible use of prompt design, ethical engagement with AI, and ongoing guidance from the instructor. This way, ChatGPT turns from a tool of traditional pedagogy into a true supporter of students’ learning, making technology useful in education while helping learners adapt to the new expectations of digitally-infused 21st-century educational environments.

2. Literature Review

The foundation for incorporating technology into language instruction started with the development of CALL and MALL. These systems are associated with the added benefits of flexibility and personalization that come from the use of technology during teaching and learning.

The use of computers and the Internet has greatly enhanced the learning of languages and these are referred to as CALL. It includes websites, software programs, and even interactive tools aimed at teaching different languages. MALL applies to the use of mobile phones and devices

such as tablets to learn languages. These devices provide convenience so that any learner can study at any time and place. The development of CALL and MALL together with new hybrid learning strategies is changing the face of education and technology. As defined by Chapelle (2001), CALL covers activities centered on the use of computers to assist learners during foreign language teaching with software, websites, and videos to enrich the learning process. This definition was broadened by Stockwell (2007) with the incorporation of mobile technology through MALL, which enabled learning anytime and anywhere.

Recent advances have brought conversational AI tools like ChatGPT to the forefront. ChatGPT is capable of understanding prompts and generating human-like responses, making it suitable for language learning contexts (OpenAI, 2023). Its potential includes instant feedback, dialogue simulation, and adaptive content generation. Researchers such as Luckin et al. (2016) and Holmes et al. (2019) have emphasized the value of AI in fostering personalized and interactive learning environments.

Unlike general AI tools, ChatGPT is highlighted as being highly responsive to educational prompts. It can simulate native speaker interaction in a safe, controlled setting. ChatGPT provides personalized language practice anytime. It offers natural, conversational English exposure. It also gives immediate corrections and vocabulary support.

However, the misuse of AI, such as using it for plagiarism or as a substitute for original work, has raised ethical concerns (Zawacki-Richter et al., 2019). The literature points to the necessity of AI literacy among students and educators to mitigate risks and maximize educational benefits. Ethical use of AI involves embracing technology as a partner in learning rather than a threat.

3. Methodology

This study was conducted with a group of teenage students (ages 13–16) in an ELT setting in Karachi, Pakistan. The students were part of the Access Scholarship Program. A qualitative action research method was adopted for this study.

The study was implemented through a two-phase classroom intervention.

Phase One: Students were given writing tasks, such as essays, narratives, or reflections. These assignments were completed without any AI assistance. Teachers encouraged brainstorming, peer review, and drafting to promote original thinking. This phase fostered independent thinking and creativity.

Phase Two: Students were introduced to AI tools. They used AI tools like ChatGPT to revise and improve their written work and audio files. Specifically, students used ChatGPT to revise and enhance their drafts. They utilized the tool for grammar correction, idea expansion, and vocabulary support. This combination of traditional writing and technological enhancement allowed students to engage with content in multilayered ways, building digital literacy alongside language skills.

In the final step of Phase Two, students transformed their writing into multimedia content. This included formats such as narrated videos and animated digital stories. This transformation used AI-powered platforms.

Other AI tools introduced and used in this methodology included:

Magic School: Used for administrative support and virtual tutoring. Magic School is mentioned as a virtual assistant.

Diffit: Used for differentiating reading materials. Diffit is listed as an AI tool.

Gradescope: Used for automated assessments. Gradescope is suggested instead of manually analyzing and checking papers.

Canva Magic Write: Used for posters, announcements, and creative projects. Canva Magic Write can be used for creating worksheets, posters, and announcements.

Data collection involved pre- and post-task comparisons, teacher observations, student surveys and output quality analysis.

4. Findings and Discussion

The study revealed several key findings regarding the integration of ChatGPT and other AI tools in ELT classrooms.

4.1 Student Engagement and Creativity Student feedback and teacher observations revealed a substantial increase in classroom engagement. Findings from the interactive writing activity showed increased engagement, creativity, and understanding when combining traditional learning with AI-supported tools. Around 75% of students expressed that the inclusion of ChatGPT made writing tasks more enjoyable and less intimidating. Creative outputs, especially in multimedia formats generated in Phase Two, demonstrated improved articulation of ideas and stronger narratives.

4.2 Improved Language Proficiency The structured use of ChatGPT, particularly for revision and enhancement, led to better organization in writing, enhanced vocabulary, and more accurate grammar usage among students. Students received instant explanations and suggestions from the AI tool. This instant feedback helped them reflect on their language use and revise more effectively.

4.3 Teacher Benefits Teachers reported significant benefits from using ChatGPT and other AI tools. There was reduced lesson planning time due to ChatGPT's ability to instantly generate warm-up questions, reading comprehension tasks, essay outlines, and create differentiated grammar or vocabulary worksheets. The AI supported differentiated instruction by tailoring content for mixed-ability learners. ChatGPT also offers time-saving feedback generation for classroom management.

4.4 Challenges and Risks Despite the advantages, the project uncovered potential pitfalls and challenges associated with AI integration. These included:

Over-reliance: Some students began depending too heavily on ChatGPT for completing tasks without fully engaging their own critical thinking abilities. This risk is also noted in the presentation notes.

Accuracy Issues: AI-generated content occasionally included factual errors or culturally irrelevant examples. Factual inaccuracies are listed as a potential risk.

Ethical Dilemmas: There was a temptation among some learners to present AI-generated responses as their own work, raising concerns about misuse for cheating. The problem status highlights student reliance on AI for quick academic solutions.

To address these challenges, teachers emphasized the importance of **AI literacy** and critical evaluation of AI outputs. Students were encouraged to use AI primarily for ideation and revision, rather than for producing final submissions. Promoting AI Literacy is highlighted as an ethical tip: teaching students "How to talk to ChatGPT wisely".

4.5 Role of the Teacher in AI-Integrated ELT Contrary to initial fears that AI might replace educators, this study reinforced the indispensable role of teachers. The conclusion states that AI isn't replacing teachers – it's empowering them. AI tools, when purposefully integrated, enhance the learning experience without undermining the teacher's authority or pedagogical role. Teachers acted as facilitators, guiding students on when and how to use AI tools responsibly. ChatGPT was positioned as a **scaffold**—supporting, not supplanting, human instruction. The vision presented is teachers as facilitators and AI as a scaffold. AI serves as an extension of their instructional toolkit.

5. Conclusion

The use of ChatGPT in ELT classrooms, when thoughtfully and purposefully integrated, significantly enhances student engagement, creativity, and digital literacy. It allows for personalized learning experiences and supports differentiated instruction, addressing traditional challenges like mixed-ability classrooms. AI isn't replacing teachers, but empowering them. Instead, AI serves as an extension of their instructional toolkit, encouraging more personalized and engaging learning. It helps bridge the gap between technology and traditional education, preparing students for future learning trends. The study concludes that AI should be viewed as a co-teacher—empowering both educators and learners.

By weaving ChatGPT into a scaffolded framework—where students first generate ideas independently, then refine them with AI feedback, and finally translate their work into multimodal formats—teachers can cultivate deeper critical thinking. Students learn to evaluate AI suggestions against their own reasoning, fostering metacognitive awareness. In doing so, they become not only proficient language users but also discerning digital citizens. Moreover, integrating AI-driven activities like role-play dialogues, interactive storytelling, and AI-prompted

peer reviews fosters collaboration and communication skills that extend beyond language proficiency. Over time, as students become more adept at crafting precise prompts, they develop an understanding of how language choices shape AI outputs—reinforcing grammatical accuracy, nuanced vocabulary, and coherent argumentation. Additionally, the availability of 24/7 AI support can bolster students’ confidence: learners who might hesitate to ask questions in a large classroom setting can experiment privately with ChatGPT, receiving immediate clarification on grammar points or vocabulary usage. This dual approach—balancing autonomy with AI assistance—helps mitigate the digital divide, ensuring that even less confident learners feel supported. Finally, as curriculum designers and policymakers observe the positive outcomes, AI-integrated pedagogies can scale across diverse educational contexts, from rural classrooms with limited resources to urban centers striving for innovation. Ultimately, ChatGPT’s role extends beyond a mere tool: it becomes a partner in the co-construction of knowledge, enabling both students and teachers to navigate the evolving landscape of ELT with confidence and creativity.

However, the implementation of AI tools must be guided by ethical standards and clear pedagogical goals to mitigate risks such as over-reliance, accuracy issues, and the temptation for misuse. With proper training and policy frameworks, educational institutions can harness the power of AI without compromising academic integrity.

Future Directions / Recommendations

Based on the findings of this study, the following recommendations are proposed for effectively and ethically integrating AI—specifically ChatGPT—into ELT classrooms. These guidelines combine practical “quick-start” actions for teachers (e.g., worksheets, lesson-plan creation) with broader institutional and pedagogical strategies to ensure sustainable, responsible AI use.

Guide Students in Ethical AI Use

Incorporate AI literacy lessons into the curriculum, teaching students to critically evaluate AI outputs, identify potential biases, and verify factual accuracy.

Emphasize that AI-generated suggestions serve as drafts or inspiration rather than final submissions, reinforcing the importance of original thought and academic honesty.

Assign reflective journals in which learners document their experiences using ChatGPT—both where AI feedback improved clarity and where it required manual correction.

Conduct Professional Development Sessions for Teachers

Organize ongoing workshops and training modules focused on:

Prompt-Engineering Techniques: How to frame clear, specific prompts that yield pedagogically relevant AI outputs.

AI Moderation & Accuracy Checking: How to vet ChatGPT responses for factual correctness, cultural relevance, and bias before sharing with students.

Blending AI with Pedagogy: Strategies for weaving AI into existing lesson structures, balancing AI support with human facilitation.

Encourage peer-to-peer communities of practice—online or in-person—where educators share best practices, co-create AI-supported lesson plans, and troubleshoot common challenges (e.g., mitigating over-reliance, correcting inaccurate AI suggestions).

Introduce AI Literacy Modules for Students

Develop classroom activities where students:

Analyze AI-generated text alongside human-authored samples to compare style, tone, and accuracy.

Engage in “AI critique” sessions, identifying strengths and limitations in ChatGPT outputs and debating which revisions improve clarity or maintain authenticity.

Teach students how to:

Use AI as a brainstorming partner: craft writing prompts that clarify their own thinking before turning to ChatGPT.

Evaluate AI feedback: cross-reference AI-generated vocabulary or grammar suggestions with trusted dictionaries or style guides.

Use AI Primarily for Practice and Reflection

Design formative assessments that leverage ChatGPT’s instant feedback—for example:

Vocabulary Quizzes: Students input a prompt like “Generate five fill-in-the-blank exercises using the word ‘consequence’ in context.”

Sentence Rephrasing Exercises: Students submit a sentence they wrote; ChatGPT suggests alternative phrasings.

Conversation Simulations: Students practice dialogues (e.g., ordering food, airport check-in) with ChatGPT acting as the conversation partner.

Reserve high-stakes, summative assessments for teacher-driven evaluation. For instance, final essays or exams should be written and submitted without AI assistance, ensuring academic integrity.

Encourage “AI-assisted peer review,” where students exchange drafts, use ChatGPT to generate improvement suggestions together, then discuss which AI suggestions to adopt.

Develop School Policies to Regulate AI Usage

Create clear, written guidelines outlining when and how students may use AI tools:

Permissible Tasks: Brainstorming ideas, drafting outlines, generating practice exercises.

Prohibited Actions: Submitting AI-generated text verbatim as final work, using AI to complete high-stakes assignments without attribution.

Establish disciplinary frameworks for misuse—such as plagiarism detection protocols—and ensure transparency so students understand consequences for academic dishonesty.

Provide teachers with ethical checklists (e.g., “Did I verify all AI suggestions?” “Have I made students aware of AI limitations?”) to maintain consistent standards.

Foster Creativity and Critical Thinking Through AI

Encourage educators to use ChatGPT as a springboard for project-based learning:

Collaborative Storytelling: Students co-write a short play using AI-generated prompts, then stage a live performance, reinforcing both language skills and creative expression.

Debate Preparation: Prompt ChatGPT to “Act like a student preparing for a debate on online learning.” Students analyze the AI’s arguments and craft counterpoints, sharpening critical thinking and fluency.

Integrate interdisciplinary projects where AI assists with research and language development in other subjects (e.g., science, history, art), showing students real-world applications of AI literacy.

Curate a Repository of Prompt Templates and Lesson Plans

Develop a shared online repository (e.g., cloud folder or teacher’s wiki) containing:

Worksheet Generation Templates: Ready-to-use prompts (e.g., “Create a worksheet on the water cycle with five fill-in-the-blank questions and two short essays”).

Lesson Plan Outlines: Sample AI-integrated lesson plans (e.g., “Using ChatGPT for a 45-minute grammar workshop”).

Reading Comprehension Prompts: AI prompts that yield level-appropriate texts with comprehension questions.

Update the repository regularly with teacher contributions, student feedback, and new AI features to ensure continuous improvement.

Leverage AI for Differentiated Instruction

Use ChatGPT—alongside tools like Diffit—to automatically generate:

Leveled Reading Passages: AI provides multiple versions of a text (e.g., Simplified, Intermediate, Advanced), enabling mixed-ability classrooms to access the same content at different complexity levels.

Tailored Grammar Exercises: AI customizes worksheets for students who need extra practice on specific structures (e.g., past perfect vs. past simple).

Implement adaptive grouping strategies: after an AI diagnostic prompt (e.g., “Write a 100-word paragraph about your favorite hobby”), ChatGPT can analyze vocabulary and syntax to group students by proficiency, assigning targeted AI-supported tasks to each group.

Monitor and Evaluate AI Impact Continuously

Establish metrics to assess AI integration effectiveness:

Student Engagement Surveys: Regularly measure students’ attitudes (e.g., “I feel more confident writing with AI feedback”).

Writing Assessment Scores: Compare pre- and post-AI intervention results on standardized rubrics (e.g., coherence, vocabulary range, grammatical accuracy).

Teacher Workload Logs: Track time saved on lesson planning, assessment creation, and grading after AI implementation.

Review these metrics at set intervals (e.g., each semester) to identify trends, successes, and areas needing adjustment.

Solicit feedback from both students and parents regarding their perceptions of AI’s role in learning, adjusting strategies to address concerns—such as ensuring that over-reliance on technology does not reduce face-to-face interaction or critical thinking.

Promote a Community of Practice

Host inter-school webinars, local conferences, or in-district workshops where teachers share:

Case Studies: Real examples of AI-integrated lessons, student outcomes, and observed challenges.

Student Work Samples: Showcasing before-and-after AI revision pieces, annotated to highlight improvements.

Research Findings: Brief presentations on emerging AI features, ethical studies, or pedagogical frameworks.

Partner with higher education institutions, AI developers, or educational NGOs to pilot innovative features—such as integrating voice-based AI for speaking practice or exploring AI-driven translation exercises—that keep the ELT curriculum at the cutting edge.

Encourage mentorship relationships where more experienced AI-savvy educators support colleagues who are new to AI integration.

Practical Applications & “Quick-Start” ChatGPT Task Templates

Generating Worksheets: To streamline worksheet creation:

Prepare a Clear Prompt: Specify topic, grade level, and exercise type (e.g., “Create a worksheet on the periodic table with five exercises on identifying patterns”).

Generate Exercises: Paste the prompt into ChatGPT, review the AI-generated list of exercises, and refine as needed.

Copy and Format: Transfer the exercises into Word (formatted in Times New Roman, 12 pt, 1.15 spacing) for printing.

Optional Interactive Worksheets: Prompt ChatGPT for VBA code conversion, then use tools like ClassPoint to make your PowerPoint slides interactive.

Creating Detailed Lesson Plans: To build comprehensive, engaging lesson plans efficiently:

Research & Gather Content: Ask ChatGPT for relevant facts, links, and context (e.g., “Provide five reliable online resources about renewable energy for Grade 5 learners”).

Brainstorm Ideas: Prompt ChatGPT to suggest educational platforms, tools, and creative classroom activities (e.g., “What interactive tools can I use to teach fractions?”).

Generate Lesson Structure: Request a structured outline—including objectives, warm-up, main activities, assessment, and closure—tailored to your subject and grade level.

Create Supporting Materials: Use ChatGPT to produce worksheets, discussion questions, or reading passages that align with lesson goals.

Make It Interactive: Optionally, have ChatGPT convert selected activities into interactive slides with embedded questions; enhance with ClassPoint for live student polling.

Customize & Refine: Edit AI-generated content to reflect your teaching style, local context, and student interests.

Practical Classroom Use Cases for ChatGPT

For Teachers:

Warm-Up Questions: “Generate five open-ended warm-up questions about environmental conservation for a 10th-grade English class.”

Reading Comprehension Tasks: “Provide a 200-word passage on cultural diversity followed by three multiple-choice and two short-answer questions.”

Essay Outlines: “Outline a five-paragraph essay on the pros and cons of social media usage.”

Differentiated Worksheets: “Create two vocabulary matching exercises: one at CEFR A2 level, one at B2 level, on the theme of health and fitness.”

For Students:

Role-Play Practice: “Simulate a dialogue where I’m ordering food in a restaurant, and you’re the server. Provide corrections to my sentences.”

Essay Writing Support: “Help me expand this paragraph about climate change by adding transitional phrases and relevant examples.”

Grammar Explanations: “Explain the difference between past perfect and past simple with three example sentences.”

For Classroom Management:

Icebreakers & Games: “Suggest three interactive icebreakers for the first day of class that involve movement and English speaking.”

Group Activity Ideas: “Provide instructions for a small-group debate on the benefits of remote learning, including roles for each student.”

Time-Saving Feedback Generator: “Given this 250-word student essay, generate a concise teacher comment focusing on strengths and areas for improvement.”

Live Demo & Walkthrough Ideas

Live Demo Prompt: “Act like a student preparing for a debate on online learning.”

Show how ChatGPT generates arguments, how students respond, and how this practice builds fluency and idea development.

Alternate Pre-Recorded Option: Record a walkthrough of ChatGPT helping a student improve a paragraph—display “before and after” versions, annotate AI suggestions, and explain why certain edits were made.

Final Message

By adopting these recommendations, ELT stakeholders can ensure that ChatGPT and other AI tools truly serve as allies—enhancing learning outcomes, fostering 21st-century skills, and maintaining the integrity of the educational process. When AI integration is guided by ethical principles, supported by ongoing teacher training, and embedded within a collaborative community of practice, AI becomes not a shortcut but a catalyst for deeper engagement, creativity, and lifelong learning.

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Teachers Wanted More Than Magic: So We Built MIXAP Together

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Abstract

This study explores the needs, expectations, and challenges experienced by in-service teachers regarding a Mixed Reality (MR) authoring tool, developed within the Erasmus+ funded MIXAP-EU project (2024–2027). Adopting a qualitative, participatory co-design methodology under a design-based research framework, data were collected through workshop notes, semi-structured interviews, and feedback forms from a co-design workshop in Denmark. Participants included three experienced in-service teachers, all female, with teaching experience ranging from 11 to over 16 years. An inductive thematic analysis, validated by strong interrater reliability (Cohen's Kappa = 0.82), alongside descriptive statistics from the UTAUT2 questionnaire, highlighted teachers' preferences for customizable MR activity templates, offline functionality, easy integration with learning management systems, and inclusive design accommodating diverse learners, particularly allophone students and those with attention challenges. Teachers emphasized the importance of accessible, curriculum-integrated tools over complex, technology-driven solutions. Findings inform the ongoing development of a practical, user-centered, and inclusive open-source MR authoring tool tailored specifically for real classroom contexts.

Keywords: *Mixed Reality, Design-Based Research, Educational Technology, Inclusive Education, UTAUT2, Technology Acceptance*

1. Introduction

As educational landscapes grapple with the dual pressures of innovation and practical classroom realities, immersive technologies like Mixed Reality (MR) are often heralded as transformative tools. MR — by blending physical and digital environments — offers significant pedagogical affordances such as concretizing abstract concepts, enhancing motivation, and fostering engagement through real-time interaction with virtual content (Akçayır & Akçayır, 2017; Azuma et al., 2001; Koutromanos et al., 2020). Yet, despite the growing enthusiasm and technical advancements enabling the creation of accessible MR authoring tools (Nazemi Bidgoli, Hatefi Afhsar, & Sadeqi-Arani, 2024), actual adoption rates in educational settings remain frustratingly low (Li, Liu, & Chen, 2023).

Research consistently underscores that teacher acceptance — not merely technical availability — is the critical bottleneck to meaningful integration (Koutromanos, Mikropoulos, Mavridis, & Christogiannis, 2024; Li et al., 2023). Prior studies, particularly those examining Mobile Augmented Reality (MAR) and Virtual Reality (VR), have mapped factors influencing educators' acceptance using frameworks like the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003; Venkatesh et al., 2012). These models reveal that perceived usefulness, ease of use, facilitating conditions, and enjoyment are key drivers of technology acceptance — but also highlight that barriers such as technical complexity, lack of curricular integration, and concerns about inclusivity persist (Ustun, Karaoglan-Yilmaz, & Yilmaz, 2023; Li et al., 2023).

Furthermore, while technological enthusiasm among teachers is high in principle, in practice, they often demand tools that are intuitive, adaptable, curriculum-aligned, and inclusive of diverse student needs (Liman Kaban & Ersoy, 2025). This study responds to that grounded, pragmatic need. Situated within the Erasmus+-funded MIXAP-EU project (2024–2027), it investigates in-service teachers' needs, expectations, and challenges in relation to a user-centered MR authoring tool designed specifically for classroom use. By adopting a participatory co-design methodology within a design-based research (DBR) framework, this research moves beyond speculative or top-down technology push narratives, emphasizing instead a bottom-up, teacher-driven design approach.

Our findings aim to inform not only the technical development of MR tools but also broader strategies for sustainable, scalable MR integration in real-world classrooms — resisting the temptation to view technology adoption as inevitable and instead treating it as a deeply human, context-dependent process. In doing so, this study also questions a persistent but largely unexamined assumption in edtech discourses: that technological sophistication alone will drive educational transformation. Our evidence suggests otherwise: for MR — and indeed any educational technology — to achieve meaningful adoption, it must first and foremost solve teachers' actual problems, in ways that are accessible, customizable, and immediately relevant to their teaching realities.

This study aims to investigate in-service teachers' perceptions of the MIXAP Mixed Reality (MR) authoring tool through the UTAUT2 framework, while also examining the challenges encountered, benefits recognized, and usability improvements suggested following their initial experiences. Research Questions:

RQ1. How do in-service teachers perceive the MIXAP Mixed Reality authoring tool, as measured through UTAUT2 constructs?

RQ2. What benefits and challenges do teachers report after their initial use of the MIXAP tool?

RQ3. What design and usability suggestions do teachers propose based on their experiences with the MIXAP tool?

2. Methodology

This study employed a qualitative, participatory co-design approach framed within a design-based research (DBR) methodology. The research was conducted as part of the development phase of the MIXAP-EU project (2024–2027), funded by Erasmus+, which aims to empower in-service teachers to create and implement their own Mixed Reality (MR) learning experiences. The study sought to gather and analyze teachers' needs, expectations, and challenges to inform the iterative development of a user-centered, inclusive, and classroom-relevant MR authoring tool.

Participants

The participants in this study were three in-service teachers from Denmark. All participants identified as female and held a Bachelor's degree in education. Their teaching experience varied, with two participants reporting over 16 years of experience and one participant reporting 11–15 years. The participants represented a range of professional experiences critical for informing the user-centered design of the Mixed Reality (MR) authoring tool. Their insights were particularly valuable given their extensive classroom experience and familiarity with integrating educational technologies into diverse learning environments.

MIXAP Tool

MIXAP is a free, open-source authoring tool built with 20 French teachers. It allows you to create MR activities for your classroom with the resources you already use. MIXAP can be used on mobile phones, tablets, or computers. You don't even need to download an app. MIXAP has four different activities; image augmentation, image validation, associating 2 images and image overlay (Figure 1).

Image augmentation: add images, videos and texts to resources used in the classroom (e.g.: add additional information to the pages of a book, an exercise sheet or professional materials).

Image validation: ask students to find an image within a given timeframe (e.g.: search-and-find activity on animals hidden in a master painting that children can do on their own).

Associate 2 images: ask students to find 2 associated images (e.g., find the “A” card that corresponds to the image of the Apple, the answer that corresponds to a mathematical equation, or the molecule that corresponds to a chemical formula).

Image overlay: superimpose layers of information on an image (e.g. see the corrections to a gap-fill text, see the muscular and blood system of a human body or the evolution of a city map over 1000 years) (Figure 1).

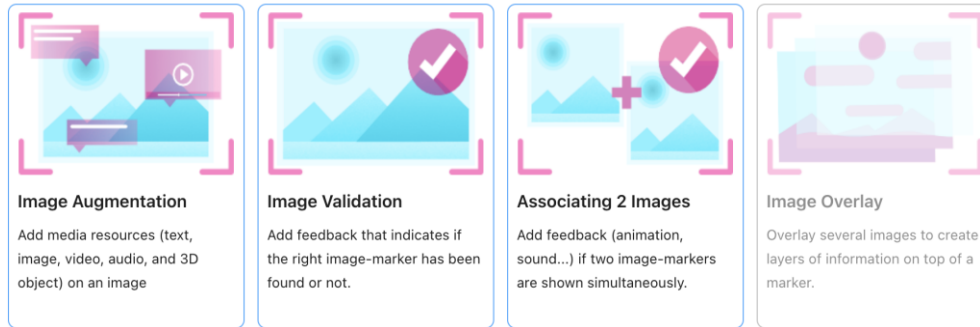


Figure 1. MIXAP activities

You can choose two different group types in the MIXAP tool; manual and automatic groups.

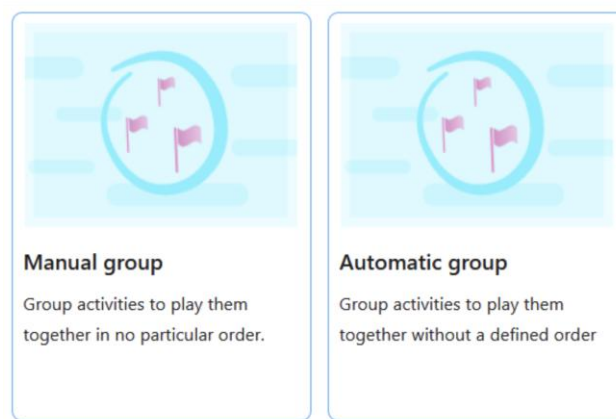


Figure 2. Group types

Denmark MIXAP Workshop

Workshop in Denmark (March 2025) with three teachers. First we introduced the MIXAP project and tool. Then the teachers tried to use the existing lesson plans (which we had already given them). In the next step, they started to create the activities for their lesson plan with MIXAP (for which we had already given them a lesson plan template). Project team members created a Google form, conducted a focus group with teachers, and got feedback from teachers about the MIXAP tool. Finally, we discussed community ideas for MIXAP with the teachers.

Data Collection

Data were collected through three primary qualitative sources during the first round of co-design workshops: workshop observation notes recorded by facilitators, semi-structured interviews with selected teachers immediately following the workshops and post-session feedback forms completed anonymously by all participants.

Data Analysis

Data were analyzed using an inductive thematic analysis approach following Braun and Clarke's (2006) six-phase process: familiarization, initial coding, theme identification, theme review, theme definition, and final reporting. Coding was conducted independently by two researchers to enhance analytical rigor. To ensure interrater reliability, both coders first independently coded a subset of the data (approximately 25%). A Cohen's Kappa coefficient was calculated to assess agreement between coders, yielding a value of 0.82, indicating strong agreement. Following this calibration, the remaining data were coded with regular consensus meetings to resolve any discrepancies.

Trustworthiness

Trustworthiness of the findings was established through methodological triangulation (workshop notes, interviews, feedback forms), peer debriefing, and maintaining an audit trail documenting analytical decisions. The interrater reliability process further strengthened the credibility of the thematic findings.

3. Findings

Table 1 presents the descriptive statistics for the teachers' responses to the UTAUT2 questionnaire. The findings suggest that teachers generally perceived MIXAP as useful for their instructional practices, as indicated by a high mean score of 4.0 on the item "I find the MIXAP useful in my teaching." However, their perceptions of efficiency gains were less positive, with the item "Using MIXAP helps me accomplish things more quickly" receiving a considerably lower mean score of 2.67. Effort expectancy results reveal a moderately positive but not unequivocal perception regarding the tool's usability. While participants found it somewhat manageable to interact with MIXAP, learning to use the tool and becoming proficient were not perceived as entirely effortless, as shown by the mean scores clustering around 3.0. Social influence emerged as a relatively weak predictor in this study. Teachers reported moderate scores (means between 3.0 and 3.33) on items assessing whether important others encouraged their use of MIXAP, indicating a limited perceived external pressure or support to adopt the tool. Facilitating conditions yielded mixed evaluations. While access to technical support and necessary resources was rated positively by some participants, high standard deviations suggest inconsistent experiences among the group. Regarding hedonic motivation, the tool was perceived as moderately enjoyable and fun, although enjoyment alone did not appear strong enough to outweigh challenges related to usability and efficiency. Overall, Table 1 illustrates that although teachers recognized the pedagogical potential of MIXAP, significant concerns regarding operational efficiency, ease of use, and social support persisted after their initial experiences.

Table 1. *Descriptive Statistics of UTAUT2*

Item	Mean	Mode	Standard Deviation
1) I find the MIXAP useful in my teaching.	4.0	4.0	0.0

2) Using MIXAP increases my chances of achieving the teaching goal that are important to me.	3.67	4.0	0.58
3) Using MIXAP helps me accomplish things more quickly.	2.67	3.0	0.58
4) Using MIXAP increases my productivity.	3.0	2.0	1.0
5) Learning how to use MIXAP is easy for me.	3.0	2.0	1.0
6) My interaction with MIXAP is clear and understandable.	3.33	3.0	0.58
7) I find MIXAP easy to use.	3.0	3.0	0.0
8) It is easy for me to become skillful at using MIXAP.	4.0	3.0	1.0
9) People who are important to me think that I should use MIXAP.	3.0	2.0	1.0
10) People who influence my behavior think that I should use MIXAP.	3.33	4.0	1.15
11) People whose opinions that I value prefer that I use MIXAP.	3.0	2.0	1.0
12) I have the resources necessary to use MIXAP.	3.67	2.0	1.53
13) I have the knowledge necessary to use MIXAP.	3.33	4.0	1.15
14) MIXAP is compatible with other technologies I use.	3.0	2.0	1.0
15) I can get help from others when I have difficulties using MIXAP.	4.33	5.0	1.15
16) Using MIXAP is fun.	4.0	3.0	1.0
17) Using MIXAP is enjoyable.	3.33	2.0	1.53
18) Using MIXAP is very entertaining	3.0	2.0	1.0

Thematic Analysis Findings

Table 2 presents the thematic analysis findings derived from teachers' qualitative feedback after using the MIXAP authoring tool. Three major themes emerged: benefits, challenges, and suggestions. Teachers identified "Image Augmentation" and "Associating two images" as their favorite activities, highlighting these features as particularly effective for promoting student engagement and learning. However, participants also reported notable challenges, such as time-consuming workflows, complex design processes, and technical issues with layout and validation. Suggestions for improvement included simplifying the interface, enhancing visual and instructional design, improving translation quality, and offering flexible, optional community support. Overall, the thematic analysis reveals that while teachers appreciated the pedagogical potential of MIXAP, addressing usability and efficiency issues will be crucial for its broader adoption.

Table 2. *Thematic Analysis*

Theme	Code	Quotes
Benefits	Time (4), Design (3), Slow (1) Balance	"children will learn in a different and fun way and it enhances their motivation for learning"
	(1) Fun (2), Fonts (1), Lag Layout (1), Large learning bank (1), time for planning (1), Data agreement (2), Technical support (1), none (2), Examples (1), Unsafe (2), Tutorial (1), Pictures (3), words (1) colors (3), AI (1)	"collaboration and social skills, Active Participation, Memory Retention, cultural & historical Exploration"
		"Mixap can help you understand concrete things better."
		"I just think simple explanations is good. And add a little fun to it."
Challenges	Time (4), Design (3), Slow (1) Balance	"It takes a long time to operate a single activity."
	(1) Fun (2), Fonts (1), Lag Layout (1),	"it needs to be more attractive design for teachers to use (to

	Large learning bank (1), time for planning (1), Data agreement (2), Technical support (1), none (2), Examples (1), Unsafe (2), Tutorial (1), Pictures (3), words (1) colors (3), AI (1)	create an activity), so you can just get started with ease" "you can also add some fun colors and a bit of fun on the children's side of the app" "1. AI, 2, Pictures and colors" "It will take some time for the teachers to plan if there is to many steps in the process"
Suggestions	associating 2 images (2) easy to use (2) Image Augmentation (2) identify objects (1), facebook groups (1), certificates (2), working time (1), Meeting (1),	"I tried Image Augmentation and Associating 2 images - I like them both, because they are easy for the students to listen and identify the difference objects." "Yeah, but not in professional life. No. I'm in the teacher's Facebook group. No. Yes, we, yeah, I follow some teacher's groups. I also follow. Yeah. In Facebook. So, the number of." "Yes, we have actually a Monday meetings where we share" "I don't think you need to do it every time we come. No. I think one time is enough. When we're finished. It's finished. It's nice to have. Then we would rather have a good cup of coffee or something." Printing and preparing is a lot of work. Taking picture of 3D objects does not work in the validation process Improve the color and instructions Make the UI more intuitive and fun. A little more fun buttons Make the translations better and make it more easy to understand. Putting some words in English.

4. Discussion and Conclusion

The findings from the present study, guided by the UTAUT2 framework, offer a critical evaluation of the acceptance and use of MIXAP among educators. While certain dimensions, such as perceived usefulness and motivational affordances, received moderate endorsement, significant concerns regarding usability, efficiency, social support, and emotional engagement emerge as substantial barriers to sustainable adoption.

Descriptive statistics revealed that Performance Expectancy was only partially realized. Although participants agreed that MIXAP could enhance their instructional practices, they did not perceive it as a tool that saves time, with one item receiving a low mean score of 2.67. This discrepancy between perceived usefulness and perceived efficiency mirrors patterns identified in the literature. Koutromanos et al. (2024) found that, although mobile augmented reality (MAR) technologies are often regarded as pedagogically beneficial, actual implementation is frequently hindered by operational inefficiencies that impose additional burdens on teachers. The finding underscores that perceived usefulness alone is insufficient if technology adds complexity or consumes excessive time.

Findings concerning Effort Expectancy were similarly mixed. Although participants generally found MIXAP manageable to use, the lower scores on ease of learning suggest that a notable subset of users encountered friction in their initial interactions. This aligns with Ustun et al. (2023), who emphasized that perceived ease of use remains a decisive factor in educational technology acceptance. Without a streamlined, intuitive interface, even highly motivated educators are unlikely to persist with adoption over the long term.

The dimension of Social Influence presented weak results, with mean scores around 3.0–3.33. Participants did not perceive strong encouragement from peers or institutional leaders to adopt MIXAP. According to Li et al. (2023), social influence remains a key predictor of technology uptake, particularly in educational settings where peer modeling and leadership endorsement are crucial. The lack of a visible and active support community surrounding MIXAP represents a major strategic gap that could limit its diffusion among teachers.

Facilitating Conditions received relatively positive but inconsistent evaluations. While some participants reported access to technical support and resources, high standard deviations indicate significant disparities in user experiences. Koutromanos et al. (2024) similarly reported that the presence of facilitating conditions alone is not sufficient; perceptions of consistency and reliability across contexts are critical to actual sustained use.

Hedonic Motivation, although moderately positive, did not emerge as a decisive factor driving adoption. Enjoyment levels were not strong enough to counterbalance frustrations stemming from usability and design issues. This finding is significant in light of Li et al. (2023), who demonstrated that hedonic motivation increasingly influences educational technology adoption, particularly among younger or early-career educators. MIXAP's inability to capitalize more fully on enjoyment-based engagement suggests a missed opportunity to solidify habitual usage patterns.

The thematic analysis reinforces and extends these quantitative findings. Participants identified motivational enhancement, personalization of learning, and improved visualization as benefits. These affordances are well documented in the literature, particularly regarding augmented and virtual reality technologies (Akçayır & Akçayır, 2017; Radianti et al., 2020). However, the benefits described tended to remain superficial, with limited indications that users saw MIXAP as a truly transformative pedagogical tool. Conversely, reported challenges were pronounced. Participants frequently cited time-consuming processes, poor design, lack of intuitive interfaces, technical support gaps, and security concerns. These barriers correspond closely to broader challenges identified in AR/VR technology integration studies (Ustun et al., 2023; Koutromanos et al., 2024). It is important to highlight that time and cognitive load burdens are particularly critical in educational settings, where competing demands already stretch teacher capacity.

Participants' suggestions for improvement—simplified object recognition, enhanced design features, flexible community support options—reflect practical and urgent needs. Importantly, participants also voiced skepticism toward mandatory socialization initiatives, preferring

optional, user-driven support networks. This pragmatism echoes findings by Li et al. (2023), who noted that flexibility, voluntariness, and self-directed engagement opportunities are pivotal for technology acceptance among educators.

Taken together, the findings paint a complex but clear picture: while MIXAP possesses foundational value in motivating and supporting student learning, critical weaknesses in usability, efficiency, and social scaffolding threaten its sustainability. The literature consistently affirms that without attention to these human and contextual factors, even promising technologies fail to move beyond the initial stages of adoption. Unless MIXAP undergoes strategic refinement aimed at radically reducing user friction and cultivating stronger organic support networks, its diffusion is likely to plateau, with initial enthusiasm giving way to gradual disuse.

In conclusion, while MIXAP shows initial promise in motivating students and enhancing personalized learning, this study exposes serious usability, efficiency, and support gaps that fundamentally undermine its long-term viability. The findings, aligned with current literature on educational technology adoption (Koutromanos et al., 2024; Ustun et al., 2023; Li et al., 2023), emphasize that positive perceptions of usefulness are quickly negated when operational and emotional barriers remain unaddressed. Without urgent redesign focused on simplifying workflows, improving design intuitiveness, building flexible support structures, and enhancing user enjoyment, MIXAP risks falling into the category of underutilized innovations. Sustainable adoption requires not just technical capability, but strategic attention to the everyday realities of educators' work, emotional engagement, and social ecosystems. Future development must be bold, user-centered, and disruptive rather than incremental if MIXAP is to achieve a meaningful and scalable impact in digital education.

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A Small-Scale Study: Analyzing Reflective Teaching Attitudes of Turkish EFL Teachers

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Abstract

This study aims to identify the attitudes of teachers of English towards reflective teaching according to their demographic features in Turkish EFL context. To collect quantitative data, Reflective Teaching Attitude Scale, which was developed by Akbari, Bahzaadpoor and Dadvand (2010) was utilized to find out the participants' tendency regarding reflective teaching. The data were collected from 65 Turkish EFL teachers and the data were analyzed according to English teachers' genders, institution type, years of experience and last degree they have completed. The results of the study establish that there is no statistically significant difference among gender, institution, experience and degree and reflective teaching for English teachers. These findings may help us to understand that Turkish EFL teachers have a potentiality in showing high level of reflective teaching practices. Their gender, years of experience and having graduate or undergraduate diploma do not significantly influence English teachers' reflective teaching practices.

Keywords: *Reflective Teaching, EFL Teachers, Teacher Attitudes*

1. Introduction

Reflective teaching has become a key focus in teacher education, reflecting a broader shift from purely theoretical models to more practical, teacher-centered approaches (Calderhead, 1988; Ekiz, 2003). Questions about how future teachers learn, apply theory, and make classroom decisions have remained central to this evolving discussion (Harvard & Hodkinson, 1994; Wallace, 1991). As a concept that merges reflection with action, reflective teaching encourages educators to think critically about their practice and respond to challenges with creative solutions (Henderson, 1996; Ünver, 2003). Reflection involves recognizing both successes and difficulties in teaching, aiming to improve future performance. Teaching, on the other hand, is defined as the process of creating meaningful, lasting changes in learners' behavior (Özçelik, 1988). According to Schön (1987), reflection can occur during the teaching moment (reflection-in-action) and after the fact (reflection-on-action).

Dewey (1910, 2007) also highlights that reflective thinking is triggered by unexpected problems and plays a central role in real-time decision-making in the classroom. Reflective teachers make intentional decisions informed by theory, personal experience, and ongoing self-assessment. By examining what they do and why, they build professional expertise (Serafini, 2002; Pennington, 1992). Reflection helps them adapt their teaching, integrate prior knowledge, and improve

student engagement. Ultimately, reflective teaching enhances both teacher development and student learning, reinforcing its lasting importance in contemporary education.

2. Literature Review

Today, since the language teaching process has evolved toward teacher-centered approach, new research has given weight to individual's decisions and individual differences (Zhou, 2017). Therefore, one of the current practices in educational areas, reflective teaching, has gained importance in second language teacher education as well. An important statement asserted by Zeichner and Liston (1996) "if a teacher never questions the goals and the values that guide his or her work, the context in which he or she teaches, or never examines his or her assumptions, then it is our belief that this individual is not engaged in reflective teaching (p.1)". This statement enlightened teachers that the desire and willingness to question and to think critically or think reflectively and teach reflectively must be developed. Reflective teaching, according to Zeichner and Liston (1996), encompasses teachers' assessing, framing, striving to solve challenges in classrooms and schools, and asking questions about assumptions and values they bring to teaching process. It also entails paying attention to the institutional and cultural context where they teach, participating in curriculum development, and having responsibilities of their own professional improvement. Moreover, reflective teaching includes critically considering what one does in the classroom, with the goal of resulting in adjustments to classroom practice on a regular basis. In line with this notion, second language teacher education programs have embraced the concept of the reflective practitioner teacher by providing learning experiences that model and promote student teachers' reflective capacities, thus equipping future teachers to be reflective professionals (Grushka, McLeod, & Reynolds, 2005; Parkinson, 2009). Therefore, there are some studies conducted with pre-service teachers. First, Minott (2011) proposed a 15- week course called reflective teaching, in the second term of third year in B.A. program. The purpose of this course is to help student-teachers to enhance their understanding of reflective teaching practices, and to be able to apply elements of the practice to their own teaching. At the end of the term, interviews were conducted with pre-service teachers and the outcomes of this course reflected that student teachers assessed themselves in terms of knowledge development, self-knowledge and out of classroom reflection, the participants stated that they improved themselves in many ways in both professionally and personally.

In addition, in Turkish EFL context, a recent study, the design of action research carried out to find out the effect of the reflective teaching practice on the development of teaching skills of the pre-service teachers (Töman, 2017). The result of the study shows that by reflective teaching, pre-service teachers gained rich experience and took the teaching values into account such as lesson targets, time management, subject acquisition and subject gradation. The reflective diary and self-assessments have created awareness in the pre-service teachers in order to remove the deficiencies and directed them to make efforts to realize the things that have to be done in teaching. In her exploratory study with pre-service ELT student teachers, Seitova (2019),

concluded that the student teachers benefited from reflective teaching practice by means of reflective diary. Engaging in reflective practice was considered as an essential opportunity for gaining awareness about teaching skills and practices, increasing self-evaluation and professional development.

Along with the importance of reflective teaching, recently, researchers have shown an increased interest in in-service teachers' practices. Thus, there are some scales, which were developed to measure English teachers' reflective teaching practices in their teaching. One of the most commonly used is "English Language Teaching Reflection Inventory," which was developed by Akbari, Behzadpoor and Dadvand (2010). Akbari et al.'s (2010) study using the English Language Teaching Reflection Inventory as a data collection tool was examined, it was determined that reflective teaching was effective in many variables related to the teacher. In Turkish EFL context, descriptive research was conducted in higher education level with 56 instructors to find out if the level of reflective teaching differs according to their gender, institution type, and the degrees of the instructors (Korumaz & Karakaş, 2014). It was found that there was no significant difference between instructors' attitudes and the last degree they earned, institution type and gender, yet they had tendency to give importance to their professional development and to reflect on classroom practices. Azizah, Nurkamto, Drajiati, and Tosriadi (2018) conducted the descriptive-qualitative study in which the data were gained through survey and interview to an in-service EFL teacher at Junior High School in Indonesia. The aim of the study was to examine teacher's perceptions about the teacher's journals. The findings of the study revealed that the teacher's diary or teacher's journal has a great benefaction for the teacher of English to be more skilled and professionally prepared to teach. The contribution of this study can be in raising awareness of the teachers' reflection in instructing English. It might be beneficial among teachers in terms of professional development through thinking about those perspectives which are straightforwardly identified with efficient instructing. On the other hand, Pazhoman and Sarkosh (2019) examined the relationship between teachers' reflective practices and self-regulation, as well as the relationship between their self-regulation and teaching experiences. The findings disclosed a positive relationship between teachers' reflective practices and self-regulation. Moreover, Shirazizadeh and Karimpour (2019) conducted research to uncover the relationship among perfectionism, reflection and burnout and the findings demonstrated that there is a significant correlation between reflective teaching and burnout level of teachers. One of the current studies which was conducted by Ehsan and Shahab (2020) investigated the relationship between the emotional intelligence of English teachers and their reflective practices with the participation of 230 teachers with the structural equation modeling approach, and the results of the research revealed that the participants' total emotional intelligence and reflective practice scores were significantly related to each other.

The number of studies on reflective teaching, its topics, and the usage of reflective teaching methods have skyrocketed, reflective teaching is becoming increasingly significant, as seen by the exponential growth in the number of studies on the subject. Some of the studies have focused on English language instructors' perspectives, who are based in higher education institutions

(Amobi, 2005; Korumaz & Karakaş, 2014), while others conducted with English language teachers and pre-service teachers in various contexts. Considering the above discussion, this descriptive study aims to address the following research questions:

1. What is the attitude of EFL teachers towards reflective teaching?
2. Do English language teachers differ in their attitudes to reflective teaching according to their gender?
3. Do English language teachers differ in their attitudes to reflective teaching according to the type of institute they work at?
4. Do English language teachers differ in their attitudes to reflective teaching according to year of experience?
5. Do English language teachers differ in their attitudes to reflective teaching according to the last degree they have completed?

3. Methods

This study utilizes quantitative research design. Foreign language teachers' attitudes towards reflective teaching were tried to be investigated, therefore, this study can be called a descriptive survey model. After obtaining permission of the developer of the scale, permission of the Ethics Commission of Pamukkale University was obtained to apply the scale to English teachers. This inventory was sent to all in-service EFL teachers who voluntarily participated in the study. The data collected with the help of Google forms version of the scale. The Consent form was declared to the participants in addition to the information note stating that it is completely voluntary and confidential in the introduction part of the scale.

Participants

The participants of this study are 65 English language teachers from different parts of Turkey, working at private or states schools and working with different level of students (primary, secondary, high and university level). 22 male and 43 female language teachers participated in this study; there are 28 BA, 31 MA and six PhD degree holders. 18 of the participants work at private schools while 47 of them work at state schools. Seven teachers work at a primary school, 26 of them work at a secondary, 18 of the participants work at a high school and 14 of them work at a university. The experience years of participants vary from 1-5 ($N=22$), 6-10 ($N=19$), 11-15 ($N=12$), 16-20 ($N=6$) and 21+ ($N=6$). The sample of the participants was determined with the simple random sampling method. In this sampling method, data were collected through 29 item English language teaching reflective inventory scale transformed to online version to have as many participants as possible and to collect data from teachers working in different demographic environments.

Data collection and analysis

The data were collected using the “English Language Teaching Reflection Inventory” developed by Akbari, Behzadpoor, and Dadvand (2010). This inventory was distributed via Google Forms to volunteer in-service EFL teachers, along with a consent form and an introductory note emphasizing voluntary and confidential participation. A total of 65 valid responses were obtained. The inventory includes two sections. The first collects demographic data, which serve as the study’s independent variables. The second consists of 29 items measured on a five-point Likert scale, with total scores ranging from 29 to 145.

The scale covers five dimensions:

1. Practical (1–6): Tools and applications of reflection such as journals, reports, observations, and portfolios.
2. Cognitive (7–12): Professional development activities like research, conferences, and staying updated in the field.
3. Student (13–15): Teachers’ reflections on students’ learning, attitudes, and behavior.
4. Metacognitive (16–22): Teachers’ views on their professional identity and beliefs.
5. Critical (23–29): Reflections on socio-political aspects like race, gender, and social class in teaching.

The overall reliability coefficient of the scale was $\alpha = 0.915$.

Table 1. *Test of Normality*

Gender	Kolmogorov-Smirnov ^a		
	Statistic	df	Sig.
Female	.103	43	.200*
Male	.215	22	.009

To analyze statistic data, SPSS 22 version was used. Normality tests were run to find out if the data distributed normally; when the results of Komogorov- Smirnov test indicate $p > .05$, it can be interpreted that the data was normally distributed. Therefore, to answer first and second research questions, independent sample t test was run. For third and fourth research questions, one way ANOVA test was applied.

4. Results

To investigate whether there is a significant difference in English language teachers’ attitudes on reflective teaching in terms of their gender, type of institute they work at (private or public), their teaching experience and last degree they held, statistical tests were run, and mean scores and standard deviation values for each dimension are given in Table 2.

Table 2. *Mean scores and standard deviation values*

Dimensions	Practical	Cognitive	Student	Metacognitive	Critical	Total	Acc
Mean	19.89	20.23	12.24	29.07	25.00	106.44	ordi
Std. Deviation	4.23	5.54	2.13	4.46	5.42	15.29	ng
Minimum	10.00	6.00	7.00	17.00	10.00	66.00	to
Maximum	29.00	30.00	15.00	35.00	35.00	136.00	the

find

ings, the mean scores were as follows: Practical (19.89), Cognitive (20.23), Student (12.24), Metacognitive (29.07), Critical (27.63), and the overall reflective teaching score was 106.44. These results indicate a generally positive attitude towards reflective teaching. Among the dimensions, Metacognitive and Critical had the highest means, while the Student dimension had the lowest.

An independent samples t-test was conducted to examine whether attitudes toward reflective teaching differed significantly by gender, as the data met the normality assumption. The results are presented in Table 3.

Table 3. *English language teachers' attitudes towards reflective teaching according to their gender*

Gender	N	Mean	Std. Deviation	t	p
Female	43	106.93	14.191	.354	.077
Male	22	105.50	17.576		

The result of the analysis indicated that male and female English language teachers did not have a statistically significant difference in their attitudes to reflective teaching ($t(65)=0.354$, $p>.05$).

For the second research question, independent samples t-test was conducted if there is a significant difference in English language teachers' attitudes towards reflective teaching in terms of their type of institute public or private schools. The following table shows us the result of the analysis.

Table 4. *English language teachers' attitudes towards reflective teaching in terms of their type of institute*

	N	Mean	t	p
Public	47	105.87	-.486	.629
Private	18	108.94		

According to the results of analysis, there is no significant difference between teachers' type of institute ($t=.486$, $p > .05$). Their reflective teaching attitudes do not differ because of their institution type.

The following research question aims to find out if teachers' teaching experience has an effect on reflective teaching attitudes. To see the results, one way ANOVA test was run, and the results can be seen in the following table.

Table 5. *English language teachers' attitudes towards reflective teaching in terms of their years of teaching experience*

Years of experience	N	Mean	F	p
1-5	22	106.95	1.12	.316
6-10	20	108.25		
11-15	12	108.66		
16-20	5	93.00		
21+	6	105.33		

As a result of the statistical analysis, no significant difference was found among English language teachers regarding their attitudes to reflective teaching according to their years of teaching experience ($p>0.05$). It can be stated that there is no statistically significant difference between experienced and novice teachers in terms of their reflective teaching attitudes.

Finally, statistical results indicated that there is no significant difference among English language teachers in their attitudes to reflective teaching according to the type of last degree they held ($p>0.05$). The statistical test run, and its results are presented in Table 6.

Table 6. *English language teachers' attitudes towards reflective teaching in terms of their last degree*

Types of degree	N	Mean	F	p
BA	28	103.95	2.705	.075
MA	31	106.19		
PhD	6	119.66		

This table can be interpreted as the following way, the last degree of English teachers held does not affect their reflective teaching attitudes.

5. Discussion

This descriptive study, which attempts to investigate whether English teachers' demographic features create any difference regarding their reflective teaching, utilized a reflective teaching scale developed by Akbari, Behzadpoor and Dadvand (2010). According to findings of the study, it was seen that English teachers have a high level of reflective teaching ability considering the arithmetic average of the total scores. This finding was in accord with the findings of Butke's

(2003) study which investigated teachers' reflective journals. It can be interpreted that English teachers are generally concerned with their reflective teaching process and give importance to their professional development and critically reflect thinking and their practices.

The results of our study indicated that there was no statistically significant difference among their genders and reflective teaching tendency of English teachers. Even though one of the recent studies (Korumaz & Özkılınç., 2015) found that female English teachers had a higher score of reflective teaching than male English teachers did and there is a significant difference. The reason for this difference between studies may be related to the number of participants. The previous study had 106 participants, 68 female and 38 male English teachers whereas in the current study there were 65 English teachers including 43 female and 22 male participants.

In addition, based on the results, it is seen that there is no statistically significant difference between English language teachers' attitudes and the type of institution they worked at. This finding is parallel with the findings of Korumaz (2012) which did not observe any statistical difference among English teachers. It can be concluded that English teachers' attitudes are not significantly affected by the institution type they currently work.

In his detailed analysis, Rodgers (2002) pointed out that experience has an influence on reflective teaching and reflective practices of teachers. In the current study, comparing reflective teaching with years of experience did not show any significant difference. It can be stated that experienced English teachers can bring theory and practice in their reflective teaching process as Filiz (2008) suggested. However, in this study the novice teachers outnumber the experienced teachers, this can explain the conflict of findings.

According to result of the present study, it was found that no significant difference observed between English teachers' attitudes and the last degree they held. This finding agrees with Mutlu and Aktan's (2011) findings which showed no significant relationship between teachers who held a BA, MA or PhD diploma in their attitudes to reflective thinking training. However, the mean scores of MA and PhD degree holders are higher than BA degree holders. In addition, English teachers who had PhD degree was so limited in this study, therefore, there is no significance between their results.

6. Conclusion

The aim of this study is to examine the attitudes of English teachers towards reflective teaching in Turkey. As a data collection tool, a reflective teaching inventory was used (Akbari et al., 2010). 65 English teachers who live in different parts of Turkey participated in this study, the participants' tendency regarding reflective teaching was analyzed according to their gender, institution type, years of experience and last degree they earned. The results of the study establish no clear relationship among gender, institution, experience and degree and reflective teaching for English teachers. These findings may help us to understand that Turkish EFL teachers have a potentiality in showing high level of reflective teaching practices. Their gender, years of

experience and having graduate or undergraduate diploma do not significantly affect English teachers' reflective teaching ability.

In light of the findings of this study, the following suggestions are made for future research. A limitation of this study is that the numbers of participants were relatively small, therefore, with a small sample size, as the findings might not be transferable to whole. The second drawback was about finding the same number of PhD holders among English teachers, there were very limited participants have PhD degree, if possible, having the same number of participants can affect the findings of study significantly. In addition, further work needs to be done to establish whether there is a relationship between reflective teaching and characteristics of English teachers. Therefore, this study was established to investigate the effects of demographic features of Turkish EFL teachers. It can be stated that the issues of English teacher characteristics and reflective teaching are intriguing ones which could be usefully explored in further research.

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APPENDIX

REFLECTIVE TEACHING INVENTORY SCALE

	1: Never	2: Rarely	3: Sometimes	4: Often	5: Always
Items	Never	Rarely	Sometimes	Often	Always
1. I have a file where I keep my accounts of my teaching for reviewing purposes.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
2. I talk about my classroom experiences with my colleagues and seek their advice /feedback.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
3. After each lesson, I write about the accomplishments/failures of that lesson or I talk about the lesson to a colleague.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
4. I discuss practical/theoretical issues with my colleagues.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
5. I observe other teachers' classrooms to learn about their efficient practices.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
6. I ask my peers to observe my teaching and comment on my teaching performance.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
7. I read books/articles related to effective teaching to improve my classroom performance.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
8. I participate in workshops/conferences related to teaching/learning issues.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
9. I think of writing articles based on my classroom experiences.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
10. I look at journal articles or search the internet to see what the recent developments in my profession are.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
11. I carry out small scale research activities in my classes to become better informed of learning/teaching processes.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Items	Never	Rarely	Sometimes	Often	Always
12. I think of classroom events as potential research topics and think of finding a method for investigating them.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

13. I talk to my students to learn about their learning styles and preferences.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
14. I talk to my students to learn about their family backgrounds, hobbies, interests and abilities.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
15. I ask my students whether they like a teaching task or not.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
16. As a teacher, I think about my teaching philosophy and the way it is affecting my teaching.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
17. I think of the ways my biography or my background affects the way I define myself as a teacher.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
18. I think of the meaning or significance of my job as a teacher.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
19. I try to find out which aspects of my teaching provide me with a sense of satisfaction.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
20. I think about my strengths and weaknesses as a teacher.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
21. I think of the positive/negative role models I have had as a student and the way they have affected me in my practice.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
22. I think of inconsistencies and contradictions that occur in my classroom practice.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
23. I think about instances of social injustice in my own surroundings and try to discuss them in my classes.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
24. I think of ways to enable my students to change their social lives in fighting poverty, discrimination, and gender bias.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
25. In my teaching, I include less-discussed topics, such as old age, AIDS, discrimination against women and minorities, and poverty.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
26. I think about the political aspects of my teaching and the way I may affect my students' political views.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
27. I think of ways through which I can promote tolerance and democracy in my classes and in the society in general.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
28. I think about the ways gender, social class, and race influence my students' achievements.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Items	Never	Rarely	Sometimes	Often	Always
29. I think of outside social events that can influence my teaching inside the class.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Innovating Language Teaching with Politeness Theory: A Theoretical Framework

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Abstract

The complexity of English as a Foreign Language (EFL) teaching is significantly influenced by sociocultural barriers and learner characteristics, which necessitate not only effective pedagogical approaches but also strategic communication throughout the instructional process. While often considered purely theoretical constructs in communication studies, politeness strategies hold considerable practical value in enhancing communicative competence within language classrooms. This study explores the integration of Politeness Theory into English language teaching, grounding its application in established theoretical frameworks. It critically examines key politeness models and addresses the cultural nuances and challenges commonly encountered in EFL contexts. By evaluating both the opportunities and limitations of applying politeness strategies, the present paper offers insights into how these theories can inform more culturally responsive and pragmatically effective teaching methodologies. The findings underscore the essential role of politeness strategies in fostering more meaningful, context-aware language use, ultimately contributing to improved learner performance and classroom interaction in EFL environments.

Keywords: *politeness, language teaching, communication*

1. Introduction

The success of language teaching, especially in English oftentimes focuses too much on grammatical accuracy, vocabulary mastery and reading comprehension. Previous research shows that the focus of English language education in many schools and universities is mostly on receptive skills, such as reading skills and comprehension (Sawir, 2005; Sugirin, 1999), with less attention given to productive skills, such as speaking. This phenomenon mostly occurs in countries that teach English as foreign language (EFL), typically countries with high cultural context and diverse ethnicity. In many countries, English is often perceived as merely a subject

by the students, resulting in weak capacity of the students to use English as a tool of communication. Ironically, from the case study of Indonesian high school students, most of them can answer correctly when given a written question in English, but pragmatically fails when they perform English in direct interaction. As language is a medium for communication, it is important to notice that language competence should consist of both grammatical competence and pragmatic competence. The pragmatic competence, which is the ability to interact based on social, cultural and discourse knowledge of the target community (Edwards and Csizer, 2004), plays a highly significant role in communication. However, in countries where English is taught as foreign language, such as Indonesia or Türkiye, it is often neglected since it is perceived as a course subject. Many students understand English, but not many of them are able to use it in proper communication activities, it's either unnatural, or too technical.

Beyond the prevalent focus on grammar and accuracy in English as a Foreign Language (EFL) instruction, another critical factor contributing to students' pragmatic competence deficiency is the implementation of ineffective strategies for encouraging verbal English use in classroom settings. Indeed, cultural backgrounds and inherent differences can pose significant obstacles to effective English communication, particularly as communication norms are frequently generalized. For instance, standards of politeness, respect, and gratitude vary considerably across cultures, often differing markedly between learners' native cultures and English-speaking contexts. Consequently, when English language instruction does not integrate comprehensive methods informed by such cultural awareness, students frequently encounter difficulties in demonstrating pragmatic competence in English.

As a fundamental aspect of communication and language use, politeness can serve as an effective pedagogical tool in foreign language instruction, critically fostering students' pragmatic competence. Politeness is commonly defined as the strategic use of language to express respect and cultivate harmonious interpersonal relationships. Consequently, effective interpersonal interaction necessitates a repertoire of strategies and linguistic tools designed to facilitate smooth communication and mitigate potential threats to the interlocutors' 'face'. Most pragmatic failures in conversation stem from misunderstandings and the inappropriate application of politeness strategies, often leading to interlocutor conflict. Brown & Levinson (1987) explains that politeness is a desire to protect the self-image of the speaking person. Santoso & Nuraini (2021) explain that in the context of teaching, to influence the students to speak politely, teachers need to speak politely. n or the concept of saving the "face". The concept of "face" in language and communication refers to how someone's image can be positive or negative. Meanwhile, cultures manage face (positive and negative) differently, different cultures use time, space, and interaction structure (turn-taking, silence, etc.) in distinct ways and often times showing certain patterns need to be recognized in order to make avoid pragmatic failure in communication (Scollon & Scollon, 2001).

Since politeness is related to the strategies of maintaining someone's face in communication, it is necessary to be taught and to be incorporated in language teaching to improve the students'

pragmatic competence and cultural awareness. Latrech & Alazzawie (2022) proves that politeness strategies are very important to keep the classroom from failing and should be able to incentivize the teachers to use politeness as a way to keep the students interactive during the classroom activity. Incorporating politeness into teaching methods and classroom activities are crucial to equip the students with the ability to recognize cultural differences and relativity, which in the long run will help them be able to navigate the use of English in communication by practicing both grammar competence and pragmatic competence. This paper aims to explore the possibilities of integrating politeness strategies into English teaching methods, thus resulting in a practical teaching framework from the grounded theories of politeness. Even though politeness itself has been reaching massive attention from scholars and researchers around the world, the significance of this article is because it enables exploration on various teaching methods and strategies by utilizing politeness theories to improve students' performance in English. In intercultural communication, this article aims to enrich further studies on cultural awareness in relation with English language teaching (ELT) practices in high-culture countries.

2. Theoretical Background

In politeness theory, it is believed that every human has a 'face,' and each of us wants to save or keep the good image of this face. Yule (2006) defines politeness as the effort to show awareness of another person's face, and that awareness can occur in either social distance or closeness between the speakers involved. Brown & Levinson (1987) argues that in general, politeness strategies can be interpreted as using different approaches and perspectives to get a form of politeness in social interaction. In a broader context, it can be defined as the choice of communication strategies to minimize the discomfort of interlocutors. According to Brown & Levinson (1987), the main purpose of utilizing politeness in communication is to avoid the Face Threatening Acts (FTA). The failure of the speakers to save the 'face' could lead to further conflict and worsen the social relationship between them. Potential conflicts occur because one of the speakers, or both of the speakers do not realize that certain expressions could be perceived as 'impolite' by the other speaker. One of the most influential studies in politeness is the framework of four politeness strategies proposed by Brown & Levinson (1987). The strategies are positive politeness, negative politeness, bald on record, and off record. The parameter of "positive" and "negative" faces is also culturally relative, thus making it complicated when it comes to intercultural communication. Scollonn & Scollon (2001) states that cultures manage face (positive and negative) differently, different cultures use time, space, and interaction structure (turn-taking, silence, etc.) in distinct ways and often times showing certain patterns need to be recognized in order to make avoid pragmatic failure in communication.

The relativity of face between cultures is explained by Watt (2003) as the result of combination between the language itself and forms of language behavior, thus becoming the heart of social communication as well as the reproduction of social structure. The necessities of involving cultural awareness in communication can be addressed with the understanding of politeness strategies and the correct use of these strategies in interaction. Another important framework in

communication and language use is the communicative competence model proposed by Canale & Swain (1980). In order for individuals to be able to communicate effectively, they need to be able to fulfill four key components, which are: grammatical competence, sociolinguistics competence, discourse competence, and strategic competence. The framework argues that these four competences should be equally mastered in having effective communication. In sociolinguistics competence, the speakers are expected to have the ability to use language appropriately in social context. For example, by knowing correct ways of turn-taking, polite and impolite expressions, interrupting a particular group of society. The integration of politeness theories and communication competence in this article is used as the fundamental ground of understanding the students' needs and navigating effective teaching methods for those learning English as foreign language in high culture countries.

Furthermore, cultural differences among students in an ELT class can be both an opportunity and challenge for the teacher. Since different cultures employ different parameters and meanings of polite communication, it is important to highlight the needs of the students from the intercultural perspective. In classroom activity, the standard of politeness from the students should be at least addressed by the teacher as well, Santoso & Nuraini (2021) argues that in the context of teaching, to influence the students to speak politely, teachers need to speak politely too. On the other hand, politeness not only functions as a strategy to make the students implement politeness in their communication, but also to push them to be more interactive and eager to try using the language. Effective classroom communication and interactive activities can potentially be achieved if the teachers implement an effective politeness strategy while delivering the lesson and giving instruction. In classroom interaction, Gunas (2023) believes that teachers and students should carefully consider the application of politeness maxims to achieve instructional goals. Instructional and interactive purposes in language class must be achieved through effective observation of the students' cultural needs.

3. Implications for Language Teaching

The integration of politeness into language teaching must be accompanied by creative and practical strategies from the teacher. Politeness should not only be comprehended at a conceptual level, but it is also pivotal to find or create specific activities where politeness is exposed in a direct and natural phenomenon. It is more preferable to not directly dictate students which one is polite and which one is impolite in English context, but the major consideration is to make the students be culturally aware first, thus they are able to navigate the differences between their culture and other cultures. This article proposes two main components that are necessary to be achieved in order to produce effective teaching methods: teachers' strategic engagement, and practical and creative classroom approach. Strategic engagement must be exclusively performed by the teachers to build the communicative environment first, and to facilitate classroom discussion between students, thus making interactive classroom communication able to be achieved. The possible teaching activities that can be used is role playing, or reflection games.

Teachers might show some phenomena of politeness and impoliteness in conversation, then ask the students to identify which one is polite according to them. Throughout this activity, students have the opportunity to recognize and practice common politeness strategies (e.g., hedging, indirectness, softening, modal verbs, greetings, and leave-takings). The second component necessary to build an effective teaching method is by implementing a practical and creative classroom approach. This approach must be focused on building cultural awareness and sensitivity of the students. For example, teachers can ask the students to collectively make a simple culture and politeness map around the world, this can be started with making the students look for ways of expressing sorry in western and eastern countries and let them discuss the differences. This activity can help students understand how politeness strategies differ across cultures and reflect on their own communication styles.

Briefly, it might be claimed that teachers play a significant role in enhancing students' intercultural competence, and politeness theories have a significant part in this enhancement. Teachers can design activities focusing on directive and expressive speech acts and discuss how these are realized differently across cultures (Fitriyah et al. 2019). Additionally, using real-life scenarios, such as email correspondence or classroom dialogues, helps students practice and compare politeness strategies from different cultures, fostering adaptability and respect (Schepers, 2014). Emphasizing politeness, care, and respect as universal values in classroom interactions supports a safe and inclusive environment for all students, regardless of cultural background.

4. Potential impact on learner motivation, classroom climate, and intercultural competence

Politeness theories and strategies concerning the students in order to enhance their pragmatic competence affect their motivation, classroom atmosphere, and intercultural competence in a positive way. Politeness helps in sustaining motivation, a positive classroom climate and in enhancing intercultural relations.

Previous studies report that a polite teacher's language and positive politeness strategies directly influence students' academic performance, motivation and encourage their active participation in classroom activities (Sülü, 2015; Widiadnya, 2018; Qiongyan and Simin, 2021; Dewi, 2023). Additionally, politeness strategies lead the way to create a lively, friendly, and harmonious classroom atmosphere by promoting understanding and cooperation (Sülü, 2015; Widiadnya, 2018; Qiongyan and Simin, 2021; Dewi, 2023). Another important aspect is the effect of these politeness strategies on intercultural competence. Scholars claim that politeness strategies are effective even when teachers and students do not share the same culture or native language, and they help bridge the cultural gaps between them and support intercultural understanding. When students are taught these strategies, they can use both universal and culturally specific politeness expressions, which can soften communication and facilitate intercultural interactions (Mahmud, 2019). This cultural awareness will be helpful for the students to adapt and contextualize the target language when they need to use that language in real life communication.

Furthermore, students' internal motivation in language classrooms can potentially be improved when classroom communication provides comfortability for the students to express themselves in the targeted language. Rivai, et al (2021) found that the use of language politeness by teachers is influential on students' academic motivation, even when the class is held online. The influence occurs as the result of the successful interaction which provides students' the feeling of secureness to be more active in using the language.

In the academic sector, the long run of effective communication using politeness strategies can also benefit students positively. Students who develop good manners and polite communication skills are more likely to succeed in their careers and personal lives, according to Zannrni and Shareef (2023). Students who get used to effective communication using politeness tend to be easier to communicate their thoughts efficiently, this plays a role in most of the education phase and stage. In the lesson's comprehension, Wang et al (2008) argues that politeness positively affects students' academic outcome especially in effective feedback given by the teacher with correct politeness strategy. Teachers who perform polite communication helped students to better understand difficult concepts. Students then develop the feeling of being helped by the teacher, which boosts not only their academic performance because now they understand better but also grow positive perception towards the class and the teacher.

5. Challenges and Considerations

Students' diversity of cultural background might be a challenge as students bring different norms and expectations to the classroom. Therefore, it is a requirement for teachers to be aware of various different approaches for different students' needs. Politeness theory can help teachers bridge these differences, not by eliminating cultural differences, but by fostering mutual understanding and respectful communication. Politeness theory, especially as outlined by Brown and Levinson, emphasizes both linguistic and socio-cultural competence. Teaching these strategies helps students navigate diverse cultural expectations in English communication, making interactions smoother and reducing misunderstandings (Alshamrani, 2023; Fitriyah et al., 2019; Schepers, 2014;)

Teachers' competence and readiness play a crucial role in how politeness strategies are integrated into classroom instruction. Competent teachers are more effective at using a range of politeness strategies, which foster respectful, engaging, and supportive classroom interactions (Rahayuningsih et al., 2020). This, in turn, enhances communication, students' motivation, and the overall learning process. Furthermore, the assessment method implemented by the teacher is also crucial as a form of accurate parameter of the success of the classroom. However, politeness strategies are quite complex to be assessed alone, thus requiring teachers to be not only creative in making classroom activities and teaching methods, but also in establishing accurate and relevant matrix for the assessment. The clear and measurable criteria for the assessment might be challenging, especially regarding the more qualitative-based skills such as pragmatics. The accurate use of politeness strategy, for example, depends on the cultural perspective of the students and teachers, which then tends to be subjective and require specific characteristics in

order to be assessed accurately. Rahmawati and Ertin (2014) explains that careful consideration has to be taken in creating a speaking assessment, because of the subjective nature of speech assessment

Most English classes in EFL countries use teacher-centered activities, making it difficult and natural to practice discussion and interactive classroom environments. An English teacher is expected to be able to efficiently hold two roles at the same time in such a class: (i) teaching English accurately and correctly; (ii) creating an interesting learning process to engage students more during class activities (Kassing, 2011). Classroom engagements are often hard to achieve due to the inappropriate ratio between teachers' availability and the number of students. One example of a case study is English learning in Indonesia, Sulistiyo (2009) found that EFL teachers face quite large classes consisting of 30-40 students. Too many students in one class will make it difficult for teachers to create a more personal learning atmosphere, and it is also difficult to observe the development of each individual's abilities. In addition to the excessive number of students, another challenge is teacher readiness. Still in the case study in Indonesia, the proficiency level of English teachers at the junior high and high school levels is quite low. The results of a survey and report by the Indonesian Ministry of Education and Culture in 2024 showed that English teachers in senior high schools who had an "advance" proficiency level or equivalent to C1 were less than 5%, and the teachers with "upper-intermediate" or B2 level is less than 25%. This is a big challenge because teacher proficiency in English certainly has a significant impact on the success of implementing methods and classroom practices that are verbal interaction and direct communication. In implementing politeness with learning methods, this requires in-depth consideration and more effective teacher training.

6. Conclusion

The theory of politeness in linguistics and communication holds a significant role in mapping the barriers to language understanding in use for interaction purposes. In ELT classes, especially in countries with high cultural contexts, cultural aspects should not be ignored because they influence students' ability not only to understand but also to use the language in the right and natural context for communication purposes. Integrating politeness strategies into language teaching, especially for speaking and classroom communication enables the maximization of language ability, pragmatic skills, and the cultural awareness of the students. The effective strategies of politeness potentially boost the confidence and speaking ability of the students. The ability of students to use correct strategies prevents them from pragmatically failing when using real-context English in an actual conversation. Furthermore, the integration of politeness strategies in ELT potentially pushes teachers and other parties involved to explore and implement more creative-communicative methods in teaching English. It leads to more grounded classroom activities and teaching that can be, for example, speaking activities based on the local culture or definition of politeness in that region to let the student notice the cultural differences between English culture and their culture. A bigger implication from this exploration is the willingness of the students to use English appropriately since understanding politeness would potentially give

them the freedom to express themselves more freely in English and interaction. Long-term benefits of this integration might also affect the perspective of teaching English in countries that teach English as a foreign language. It potentially opens discussion on how to intertwine the cultural needs of the students and their English ability so English is no longer seen as just a subject by the students, but also a language that they can use freely and confidently in everyday real-life contexts.

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Teachers' Perception on the Role of Applying Gamification in Young Learners' EFL Classes

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Abstract

This study aims to find out the perceptions of English as a Foreign Language (EFL) teachers on the role of gamification in their classrooms considering its potential to increase student engagement. Quantitative research was conducted via a survey consisting of 14-questions that was adapted from Pham and Pham's (2022) study on 40 EFL teachers. The aim was to evaluate how educators perceive gamification's support in improving learning, and the difficulties they encounter. The study covered a wide range of subjects, including the effect of gamification on student engagement and whether it impacts students' proficiency in language development. The participants answered questions about the difficulties of integrating game-based activities into English as a Foreign Language contexts, how much time the integration necessitates, whether it distracts learners or engages them in the lessons, and if it is easy to find games that cover related topics of grammar. Although there are challenges when it comes to implementing these games into classroom contexts, findings show that gamification is perceived as a useful tool to enhance learning with its engaging nature. This study offers valuable insights for teachers who are eager to transform traditional classrooms into dynamic and student-centered environments.

Keywords: *gamification, game-based learning, engagement, young learners, English language teaching*

1.Introduction

In today's developing world of technology, teachers are often in search of innovative ways of teaching. Teachers constantly seek ways to make learning more fun, engaging, and effective for students to learn permanently and effectively in a personalized and motivated way, especially for young learners in a Foreign Language (EFL) classroom. This study aims to gain insight about and understand how teachers perceive the role of gamification in their classes, how applicable it is, and to what extent it is useful to implement. Gamification gained popularity with its nature of integration of elements like points, rewards, competition, and interactive personalized experiences. That is why gamification is not primarily considered a trend recently but also an innovative strategy. Research has shown that gamification can help foster a positive learning atmosphere with its encouragement to participate actively while reducing anxiety levels. Studies, such as Pham and Pham (2022) and Titania's (2024), have shown that implementing gamification in EFL settings may integrate grammar into language classes better, as it has an impact on helping students acquire grammar points inductively and in a dynamic and engaging way. Despite these promising benefits, some disadvantages or implementational issues have also been studied

such as lack of time, limited resources, and finding a suitable game in compliance with the curriculum goals (Helvich et al., 2024; Demirbilek et al., 2022).

A survey taken from Pham and Pham's (2022) study was conducted on 40 EFL teachers to evaluate gamification's success and assess their experiences with it. The survey consisted of 14 questions, and it assessed various aspects of gamification in young learner classrooms from the perspective of time management, grammar points, engagement, and possible drawbacks. The different perspectives of the teachers are the main guidance of this study, and accordingly to their insights, the key points are evaluated. It is generally supported that game-based tools for fostering language abilities are very efficient if they are used in the right way and the possible drawbacks can be overcome. Also, for the students who are having a hard time dealing with anxiety and struggling with traditional methods, it might be very useful so as to allow learning to take place (Chan & Lo, 2024; Thuy & Hung, 2021). According to Waer (2021), some teachers are not sure whether game-based lesson plans meet the teaching objectives or just staying as a fun activity.

This study tries to shed light on these gaps with the help of teachers' real-life problems on the mentioned topic. Helvich et al. (2024) recommended that schools should provide teachers with ready-to-use gamification tools that align with curricular goals, to make educators to focus more on student interaction. Although gamification has its possible disadvantages, when it is used carefully, it has the power and potential to empower lesson plans by engaging and motivating learners. Alhebshi and Halabi (2020) and Lastari et al. (2020) delve into the emotional and psychological impacts of the method, and they state that, with the reduced anxiety levels of students thanks to this method, a more encouraging classroom atmosphere can be achieved.

2. Literature Review

Gamification transforms the way teachers engage their students in the lesson, especially the young ones in EFL (English as a Foreign Language) classrooms. With the help of having fun and blending it with pedagogical value, game-based elements such as competition, rewards, prizes may create an engaging learning environment for the learners and may help to keep students motivated. According to Pham and Pham (2022), gamification has an impact on making grammar teaching more engaging and meaningful by balancing objectives and interests. They found that when teachers implement games in their classrooms, learners are more likely to be relaxed and enthusiastic to learn and participate in activities. This point of view is supported by Titania (2024), who argues that gamification brings a natural way of learning grammar by giving opportunities to students in acquiring grammar objectives through repetition and exposure. In addition to that, according to Chan and Lo (2024), gamification fosters the intrinsic drive and it becomes more fun and enjoyable to learn compared to traditional methods. With the help of rewards, grammar becomes a challenge that they are willing to overcome rather than a dread since when they see their progress, it increases their commitment to learning.

Gamification's power goes far beyond shaping grammar points as it may help to improve many language abilities with very little effort. As Alhebshi and Halabi (2020) stated, digital game-based learning creates engaging environments that students use English actively in a meaningful context. According to Thuy and Hung (2021), students felt more relaxed and engaged as gamification apps promoted a stronger engagement. Thus, their ability to speak improved. Based on Lastari et al. (2020), gamification also promotes self-directed learning since it makes students more likely to study language resources outside of class while feeling motivated to learn and taking responsibility for their own learning.

Although there are many advantages of applying gamified lesson plans in EFL settings, teachers may face difficulties in implementing them effectively in their classrooms. Demirbilek et al. (2022) highlighted one of the most common issues on this as the time required to cover all aspects of grammar and manage lessons as they have curricula to follow. Thus, balancing these two essentials at the same time with engaging activities might be a lot for some teachers. Helvich et al. (2024) emphasize another challenge as finding high-quality, curriculum-aligned games that truly support the language objectives. Teachers agree that they occasionally feel frustrated when they need to modify the already existing games according to their lesson plans. Waer (2021) found that gamification might not be so effective if they are implemented incorrectly. Some of the students might only focus on winning which can result in having difficulties in achieving learning goals. Teachers in the study noted that the balance between competition and collaboration to maintain an anxiety-free atmosphere should be maintained. In order to preserve this positive environment, these obstacles must be overcome. In the end, teachers are aware that there is no "one-size-fits-all" cure for applying gamification in EFL classrooms. While some students may find it difficult to focus on, others may flourish in game-based learning environments.

According to Al Mursidi et al. (2024), applying gamification in EFL classrooms may enhance lessons without the fear of judgement and accordingly, builds their confidence in speaking. By removal of these obstacles, it is possible to give students the chance of making mistakes freely. Lastari et al. (2020) found out that in online EFL classrooms, gamified elements such as interactive quizzes and immediate feedback, might make students more likely to feel relaxed and comfortable. Pham and Pham (2022), stated that game applied classrooms helped students who had previously experienced grammar anxiety to overcome this problem. These studies all have as a common theme that learning thrives when students feel comfortable and involved.

Titania (2024) noted that students often do not even realize that they are learning as during the games, they have so much fun. Teachers in the study reported that students who once had grammar anxiety were now eager to participate in lessons with the help of these applications. According to Chan and Lo (2024), gamification is a good fit for young learners' natural urge to play. Scoreboards, achievement improvements, and group tasks are a few examples of methods that game-based applications offer and teachers can use to positively foster students' desire to succeed. Nguyen and Hung (2021) stated that, with the help of this method, weaker students can get the motivation they need so that they can achieve what they cannot with traditional methods.

Teachers' perceptions on the implementation of gamification in EFL classrooms play a crucial role in its implementation. Thuy and Hung (2021) found that while many teachers are enthusiastic about the potential gamification has, some feel they lack the technical knowledge to integrate it effectively into their lessons. According to Pham and Pham (2022), teachers who have an open mind to use game-based implementations are more likely to see the improvements. However, they also stated that using gamification as a supplement rather than a complete replacement for traditional methods might be a better idea.

3. Methodology

The study aims to gain insights of teachers' perceptions on the role of applying gamification in young learner EFL classrooms. A quantitative research design was implemented to gather data on the perceptions of teachers and the pedagogical value of gamification in EFL young learners' classrooms, teachers' attitude towards the implementation of gamification, teachers' perceptions on the effectiveness of gamification, and the frequency of gamification utilization in EFL young learners' classrooms. The study employed a survey-based approach with the help of a structured questionnaire taken from Pham and Pham's (2022) study with an agreement scale ranging from strongly agree to strongly disagree. The study is followed by a descriptive quantitative research design allowing the deeper analysis of the perspectives of teachers which the questionnaire was implemented on. A total of 40 EFL teachers specialized in working with young learners were selected as convenience sampling targeting the aimed background. The questionnaire aimed to highlight the potential drawbacks and the effectiveness of gamification in grammar and language developments skills, as well as the motivational impact and the pedagogical value of it. The survey was distributed digitally to make sure of the high completion rates of the participants. Consent and anonymity were assured before the participants responded to any questions at the beginning of the survey and the participants were informed about the survey content.

The survey is taken from Pham and Pham's (2022) research and adapted accordingly to evaluate the insights of EFL young learners' classroom teachers. The survey consists of 12 questions and covers 4 main areas. The answers are ranked on a Likert scale consisting of five options ranging from strongly agree to strongly disagree. Reliability analysis of the scale used in the study. The total Cronbach alpha value was found to be 0,151. Considering that 0-1 is accepted for reliability the values obtained regarding the reliability of the scale are sufficient.

When the reliabilities of the scale and their sub-dimensions are analyzed, it is seen that the "Teachers' perceptions of pedagogical value of gamification in English grammar teaching" subgroup has the reliability of 0,015. And the "Teachers' attitudes towards the implementation of gamification in English grammar teaching" subgroup has the reliability of 0,531. The "Teachers' perceptions of the effectiveness of gamification usage in English grammar teaching" subgroup has the reliability score of 0,101. Lastly, in the "The frequency of gamification in utilization in English classes" subgroup has only one survey item, the measurement of reliability was not possible to work on.

Accordingly, data was collected from the answers of the teachers that took the survey, the acquired data were coded and implemented to the SPSS programme. Skewness and Kurtosis results were examined accordingly. In that sense, Normality test was implemented. According to Tabachnick and Fidell (2013), if Kurtosis and Skewness scores remain between (+1.5) and (-1.5), the data shows a normal distribution (Aytekin, 2018).

Table 1: *Skewness and Kurtosis Values of the Teachers' Perception Towards Applying Gamification in Young Learners' EFL Classes Scale*

Scale	N	Subgroups	Skewness	Kurtosis
Teachers' Perception of Applying Gamification in Young Learners' EFL Classes	40	Teachers' perceptions of pedagogical value of gamification in English grammar teaching	-0,357	-0,313
Teachers' Perception of Applying Gamification in Young Learners' EFL Classes	40	Teachers' attitudes towards the implementation of gamification in English grammar teaching	-0,367	-0,189
Teachers' Perception of Applying Gamification in Young Learners' EFL Classes	40	Teachers' perceptions of the effectiveness of gamification usage in English grammar teaching	-0,539	0,974
Teachers' Perception of Applying Gamification in Young Learners' EFL Classes	40	The frequency of gamification utilization in English classes	0,998	0,995

Table 1, shows the Skewness-Kurtosis according to the sub-dimensions of the scales used in the research. Values are given and the overall Skewness value of scale is -0.0662, the Kurtosis value is 0.366. Accordingly, the value range of Skewness coefficients is between +1 and -1. It can be interpreted that it shows a normal distribution.

4. Findings and Discussion

The findings of the research reflect insights into the perceptions of the teachers of young learners' EFL classrooms. Results obtained from 40 EFL teachers using a 14-item questionnaire adapted from Pham and Pham's (2022) study show the key considerations as pedagogical, motivational, and possible challenges of applications of game-based lesson plans.

4.1 Teachers' perceptions of pedagogical value of gamification in English grammar teaching

Table 2: *Teachers' perceptions of pedagogical value of gamification in English grammar teaching*

Statement	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
1. Using gamification in grammar teaching creates both fun and pedagogical value.	57,5	42,5	0	0	0
2. Teachers should pay special attention to the role of gamification in English language teaching.	30,0	57,5	12,5	0	0
3. The implementation of gamification in English language teaching not only helps students to improve their grammar but also other skills of language.	40,0	47,5	10,0	2,5	0
4. Gamification should only be used for fun rather than as an alternative for instruction.	12,5	57,5	12,5	15,0	2,5

Table 2 shows the data of teachers' perceptions of pedagogical value of gamification in English grammar teaching. The results of the first question show that the majority of participants (57,5%), believe that gamification creates both fun and pedagogically valuable. The question whether teachers should pay special attention to the role of gamification in classroom, get 57,5% of the respondents showing their agreement on the issue. 47,5% of the participants confirm that the implementation of gamification in English language teaching not only helps students to improve their grammar but also other skills of language, while 10,0% of them are neutral, and 2,5% are against that statement. Lastly, regarding the statement that gamification should only be used for fun rather than as an alternative for instruction, 57,5% agree, 12,5% neutral idea and 15,02% disagree. Despite the many advantages mentioned above, the study shed light on some of the disadvantages of the applications in EFL classrooms.

4.2 Teachers' attitudes towards the implementation of gamification in English grammar teaching

Table 3: *Teachers' attitudes towards the implementation of gamification in English grammar teaching*

Statement	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
5. Students' comprehension of grammar cannot be measured by gamification in the classroom.	10,0	47,5	17,5	20,0	5,0
6. Utilizing gamification to teach grammar may divert students' attention away from the lesson.	12,5	57,5	15,0	12,5	2,5
7. Utilizing gamification in my grammar lesson might take up a lot of time.	7,5	45,0	22,5	25,5	0
8. It's challenging to find a gamification that covers every facet of grammar.	2,5	12,5	17,5	62,5	5,0

The information regarding teachers' attitudes towards the implementation of gamification in English grammar teaching is presented in table 3. The results show that 47,5% agree with the idea that students' comprehension of grammar cannot be measured by gamification in the classroom. According to the table, 57,5% report that the use of gamification in the language classroom can have negative influence on students' concentration on the lesson, 15.0% neutral, and 12,5% agree that students can be distracted by the implementation of gamification. For the use of gamification in grammar lessons might take up a lot of time statement, 45,0% agreed, while 25,5% show their disagreement. Finally, the majority of the participants (62,5%) confirm that it's challenging to find a gamification that covers every facet of grammar, and 17,5% neutral.

4.3 Teachers' perceptions of the effectiveness of gamification usage in English grammar teaching

Table 4: Teachers' perceptions of the effectiveness of gamification usage in English grammar teaching

Statement	Strongly Agree		Neutral	Disagree	Strongly Disagree
	Agree (%)	(%)			
9. Utilizing gamification to teach grammar might help students feel less anxious about the subject.	65,5	35,5	0	0	0
10. When it comes to grammar instruction, gamification is not particularly helpful.	15,0	57,5	17,5	7,5	2,5
11. Grammar games are designed to motivate, entertain, teach, and enhance fluency.	47,5	47,5	5,0	0	0
12. Grammar games are a very motivating and fun approach to teach grammar, particularly to weak students.	57,5	37,5	5,0	0	0
13. While participating in a game, learners are not concerned with concentrating on the structures, but instead intuitively learn them.	22,5	55,0	17,5	5,0	0

Table 4 presents the information regarding teachers' perceptions of the effectiveness of gamification in English grammar teaching. Specifically, 65,5% agree the utilization of gamification to teach grammar might help students feel less anxious about the subject. However, 7,5% of the participants show their disagreement with the statement that gamification is not particularly helpful when it comes to grammar instruction, 17,5% are uncertain and 47,5% agree with this statement. For the statement grammar games are designed to motivate, entertain, teach, and enhance fluency, 47,5% express their agreement, no one disagrees and 5,0% neutral. Similarly, 57,5% think that using gamification in grammar lesson is very motivating, especially for weak students. Finally, almost half of the participants (55,0%) confirm that while participating in a game, learners are not concerned with concentrating on the structures, but instead intuitively learn them and 17,5% stays neutral and 5,0% disagrees.

These findings are also consistent with Demirbilek et al. (2022) findings. He stated that teachers often have difficulty in adjusting their lesson plans according to the curriculum and sparing enough time for applying gamification. Additionally, another drawback is also highlighted as the potential distraction from target structures and only focusing on the rewards. Some of the teachers stated that high rates of competition over learning may result in a concern if the lesson is not well-organized or structured (Waer, 2021). According to the survey results, gamification is

considered as highly effective evaluated from the motivation perspective. Murshidi et al. (2024) and Lastari et al. (2020) support this observation stating that as these lesson plans create a relaxed and anxiety-free environment students are more likely to feel comfortable to participate in. These findings reflect Pham and Pham's (2022) results, showing that gamification can be used both for entertainment and educational goals with well-defined objectives.

4.4 The frequency of gamification utilization in English classes

Table 5: *The frequency of gamification utilization in English classes*

Statement	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
14. I try to incorporate as many games as possible into my grammar lessons.	30,0	55,0	7,5	7,5	0

In table 5, question 14 asks the participants the frequency they utilize gamification to teach grammar in their lessons. According to the findings presented in the table, 55,0% of the participants tries to include games into their lessons as much as possible, 7,5% are not sure or do not try to utilize gamification in grammar lesson and 7,5% disagrees with the statement.

5. Conclusion

The findings indicate that the application of gamification in young learners' EFL classrooms holds a great potential of fostering engagement, motivation and a positive classroom environment if the possible challenges can be solved before utilizing it. The results show that teachers seem to perceive gamification as a valuable tool to increase in-class participation and as a useful method to increase grammar comprehension. They also stated that it is useful for decreasing anxiety levels with its fun nature although some drawbacks or implementational issues cannot be unseen. We can summarize these challenges as the required time to implement gamified activities into classroom practices, curriculum alignment, abundance of resources, and the workload of teachers. These issues must be taken into consideration beforehand for gamification to be benefited at its most.

Despite the challenges, this study suggest that gamification has the power and potential to transform traditional young learners' EFL classrooms to more dynamic, engaging, productive, and anxiety-free learning environments. With meticulous planning and implementation, it can serve as a strong tool to boost mentioned skills in students' language development and overall language proficiency.

Although this study provides valuable insight on utilizing gamification in young learners' EFL classrooms, it has limitations as well. The sample size can be counted as one of these limitations as it is only 40 EFL teachers. That is why the questionnaire answers may not be generalized. Also, these results may change according to the perspectives of EFL teachers depending on the

educational settings, standards, and regions. In addition to this, the self-reported data may show bias as teachers' perceptions may differ according to their working settings and to their social desirability rather than their experiences.

For future research, the effectiveness of gamification tools might be identified and their best performance for language development can be researched on. Students' perspectives on the role of game-based approaches in EFL classes to raise awareness is also open to research. By enlightening these areas, future studies may offer a deeper insight into the role of gamification and also more actionable recommendations for educators and institutions.

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Beyond the Classroom: Factors Influencing EFL Teacher Wellbeing and Job Satisfaction

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Abstract

This mixed-method study examines the relationship between teacher wellbeing and job satisfaction, and the factors affecting them at tertiary-level EFL settings. The sample (n=35) is chosen through convenience sampling. The participants are EFL instructors working at a preparatory school in Istanbul, Türkiye. An online survey, taken from Adeka & Mede (2022), consisting of Likert-scale items for quantitative data and one open-ended question for qualitative data, was sent to the participants individually. The results show that half of the participants' overall wellbeing is affected positively by their relationship with their students and colleagues as well as by meeting their students' goals, their satisfaction with their current workplace, and the health of their families and friends. Regarding job satisfaction, the majority of the participants (n=20) stated that having good rapport with their students was important. In addition, they mentioned that teaching gives them the opportunity to be creative and use various skills, provides professional improvement opportunities, and makes them feel responsible for their teaching. Adversely, salary and benefits, time management issues, and physical surroundings of the school were reported as factors affecting job satisfaction negatively. For higher job satisfaction and teacher wellbeing, teacher recognition and equitable compensation should be prioritized as well as professional development opportunities and support.

Keywords: *teacher wellbeing, job satisfaction, English language teaching, tertiary-level, positive psychology*

1. Introduction

Teaching has always been a demanding profession regardless of the methodologies used in teaching settings throughout history. The reason for this is the fact that it requires not only knowledge of subject matter, but also emotional strength and intrinsic motivation. Especially in EFL settings, teacher wellbeing has been a vital issue considering the importance of the psychological and emotional status of teachers and its effect on their classroom practices. Additionally, similar to their wellbeing, the impact of the level of job satisfaction of a teacher cannot be undermined in the quality of education they provide their students with (Seligman, 2011; Derakhshan et al., 2022). Acknowledging the impact of teacher wellbeing for continuous student success is essential when the demanding nature of teaching a language taken into account since it requires emotional and cognitive strength as well as strength to tackle the sociocultural

challenges posed by the specific context they are in. Therefore, this study aims to investigate the positive and negative factors impacting teacher wellbeing and job satisfaction as well as the relationship between the two in Turkish tertiary-level EFL contexts.

2. Literature Review

Teacher wellbeing is known to be a concept with many components such as emotional and psychological wellbeing in addition to the professional aspect of it. Seligman (2011) argues that teachers should achieve both their professional and personal goals to be considered to have teacher wellbeing. Especially EFL teachers, who need to work with the cultural and linguistic aspects of the language, should acquire teacher wellbeing (Fathi et al., 2020; Han, 2022).

Unfortunately, existing research highlights many factors affecting teacher wellbeing adversely. Stress, according to Alqarni (2021), has a detrimental impact on teacher wellbeing, specifically when it continues for a long period of time. Teacher burnout, meaning a sense of loss of achievement or a feeling of exhaustion, is another negative factor all around the world (Karavas, 2010; Chen & Tang, 2024). Lack of appreciation for their work or support from administrators of the institutions and unsatisfactory salaries they are paid are other important factors that should be considered as having an adverse effect on teacher wellbeing (Aydın, 2012; Sadeghi & Pourbahram, 2024). Last but not least, Onan and Aydın (2024) investigated the main stressors for teachers. They concluded that in addition to the anxiety experienced by many teachers, newly graduated teachers are more prone to experiencing issues with time and classroom management, low student motivation and engagement, low language proficiency on their behalf, and difficulties incorporating technology into their teaching contexts.

On the other hand, positive factors affecting teacher wellbeing and job satisfaction have also been investigated. Teachers achieving their personal and professional goals as well as their belief in their ability to do so, that is, their self-efficacy, are known to have a positive impact on them improving their wellbeing and job satisfaction (Fathi et al., 2020). Not only individual, but also collective teacher efficacy proves to enhance teacher job satisfaction and wellbeing (Göker, 2012). Moreover, being able to regulate their emotions helps teachers tackle the challenges they face on a regular basis and decreases the possibility of experiencing burnout and exhaustion while increasing the levels of job satisfaction. Similarly, high teacher resilience, in other words, teachers' ability to cope with negativity or challenges, is proven to have a positive correlation with their job satisfaction and wellbeing (Han, 2022).

Wellbeing and job satisfaction go hand in hand; they predict and produce each other. Teacher autonomy, as well as appreciation from administration, serves as an intrinsic motivator for teachers and gives them purpose to continue their profession (Syamananda, 2017) although the sources for extrinsic motivation such as salaries and workload are still a concern (Sadeghi & Pourbahram, 2024). Considering the fact that teacher wellbeing means different things in different contexts, it is vital to investigate the factors in alignment with cultural values. In other words, teacher wellbeing may mean various things depending on context and teacher experiences

and needs are shaped in many ways accordingly (Nwoko et al., 2023). Taking the Turkish EFL context into consideration, it can be underlined that there are both similarities and differences between the wellbeing notion of Turkish EFL teachers and teachers from other cultures (Adeka & Mede, 2022). The national assessment system in Türkiye requires students to prepare for national exams, which limits the range of in-class practices to a more extrinsic teaching methodology and naturally, rather summative assessment tools instead of a more student-centered teaching and more formative assessment tools such as peer reviews and portfolios as well as presentations and discussion sessions. That is, policies designed and adopted by institutions, naturally, relate to the cultural expectations, shaping the teacher behaviors and consequently, their perception of wellbeing (Adeka & Mede, 2022). Similarly, in Saudi Arabia, support given by institutions has shown to affect teacher wellbeing as in many other countries while demographic features such as age and gender showed inconsistencies depending on the context of the study.

3. Methodology

This study adopted a survey to collect quantitative data and one open-ended question for qualitative data to investigate the factors having an impact on teacher wellbeing and job satisfaction in Turkish tertiary-level EFL settings. The quantitative part of the survey consisted of questions related to the demographics of the participants in the first section. The second section with 28 statements aimed to find out the factors affecting the wellbeing of the participants positively and negatively. Factors in the statements included institutional support, teachers' relationships with both their colleagues and their students, and the level of autonomy they are given in lesson design. The participants were provided with a brief description of the term wellbeing, and they were asked to decide whether the given statements affect their teacher wellbeing negatively or positively on the Likert scale. The third part, also consisting of 28 Likert-scale items ranging from strongly disagree to strongly agree, investigated the job satisfaction levels of the participants and the factors affecting job satisfaction. The last question was an open-ended one asking for the comments of the participants regarding their current levels of wellbeing or job satisfaction and their experiences related to them. To analyze the data collected through the online survey, correlation analysis and descriptive statistics were utilized. Means, frequencies, and standard deviations for each item were calculated to understand the perceptions of the participants regarding teacher wellbeing and job satisfaction, in addition to the factors affecting them. In light of the analysis, it can be underscored that higher mean scores for the wellbeing and job satisfaction items in the survey showed positive correlations and lower mean scores implied a negative effect on teacher wellbeing and job satisfaction. Thematic analysis was done for the responses to the open-ended question. The comments and the patterns in them were carefully identified to see their correlation with the results obtained from the quantitative sections of the survey.

The online survey link was sent to instructors working at foundation universities in İstanbul, Türkiye. 35 volunteering instructors participated in the study to share their opinions and insights. 48.6% of the participants held a bachelor's degree; 45.7% had their master's degree and the rest

had completed their PhDs. The years of teaching experience varied greatly; 28.6% of them had six to ten years of experience, 11.4% worked as a teacher for more than 25 years, and 14.3% of the participants were newly graduated teachers who were working their first or second year in the teaching profession. They had classes with students at various levels of English proficiency, ranging from CEFR A2 to C1 and EAP/ESP.

4. Findings and Discussion

The participants, 35 tertiary-level EFL instructors, had varying years in the teaching profession, which highlights the possibility of them to combine the traditional, experience-based teaching methodologies which have proven to lead to students' success with the new, modern, and student-centered pedagogies for better learning environments for desired student outcomes. The fact that the instructors teach students with different levels of English proficiency suggest that the results reflect a wider range of teaching contexts.

When it comes to the factors which have an impact on teacher wellbeing are discussed, it can be seen that the instructors generally viewed their relationship with the students in their main classes and other classes positively. That is, if they have positive relationships with their students, the level of their teacher wellbeing increases. Similarly, although the results are not as consistent, their relationship with the members of the administration have a positive correlation with wellbeing. The inconsistency in the results for this item may be caused by different experiences they have with the administrators depending on their years of teaching experience or their positions in their institutions. With a standard deviation of 1.52, their communication between them and their colleagues and other members of the institution imply a positive correlation with teacher wellbeing. Lastly, regarding their relationship with others, their positive relations with the people at home also affect their wellbeing positively (SD=1.60).

Generally, the participants' workload and the tasks they have to tackle on a professional level showed to have a negative correlation with teacher wellbeing. The marking work they do after exams had a neutral to slightly negative effect on their wellbeing. Lesson planning had a similar, but a little more positive impact compared to marking, with a mean of 5.22. Doing overtime to complete the tasks they do not have the time to in the allocated time also affected their wellbeing negatively. Finally, with a mean of 4.53, doing administrative work was seen as a negative factor affecting their wellbeing adversely.

As mentioned earlier, teachers' professional and personal self-efficacy also has an immense impact on their wellbeing positively (Fathi et al., 2020), and the result of the study aligns with the literature greatly. The participants expressed that their knowledge of subject matter and level of proficiency was a strong factor, with a mean of 6.00, indicating that the more confident and knowledgeable they feel in pedagogy, linguistics, and methodology, the more enhanced they are in terms of wellbeing. In addition, teacher autonomy is a major contributor to teacher wellbeing, considering the contentment and pleasure of being able to control what they teach and how they

teach. Moreover, according to the results, meeting their students' learning goals and the outcomes correlates positively with teacher wellbeing.

The participants expressed varying opinions regarding the institutional and environmental factors that have an impact on their wellbeing. To begin with, their wellbeing was affected positively by their overall satisfaction with their current jobs. While the procedures adopted and put in place by their institutions showed a positive correlation with their wellbeing, the support they receive from their administrators and the availability of materials and facilities offered by their institutions for online teaching was rated neutral to slightly positive. When it comes to their participation in the decision-making processes of the institution, they had a moderate view, implying that these processes had a neither positive nor a negative impact on their teacher wellbeing. However, what was reported as a negative factor impacting wellbeing was the number of breaks they had during the day. A more concerning factor was the salary and benefits; since they believed that they did not earn what they deserved and it caused financial problems, their wellbeing was adversely affected; therefore, salary and benefits was reported to be one of the aspects that was rated the lowest.

Finally, in addition to their relationship with their students, their students' behavior and motivation levels were listed as factors affecting teachers' wellbeing. With a mean of 5.08 and a standard deviation of 1.61, student behavior was reported to have a varied but generally positive impact similar to student motivation with a mean of 5.03 (SD=1.78).

The participants rated their levels of job satisfaction on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). When it comes to professional growth and the nature of the profession, instructors showed agreement in teaching being a job that gives them opportunities to grow in a professional sense with a mean of 3.72 and a standard deviation of 1.00. Similarly, they greatly agreed that they could use a variety of skills as they teach with a mean score of 4.33 (SD=0.78) and that teaching is an interesting and a pleasant profession which leads them to use their creativity.

Similar to the results of the teacher wellbeing section of the survey, the salary and benefits items in the job satisfaction part also underscored that the instructors were not pleased with their income. They reported to not being paid enough for their daily expenses, for the abilities they have, and compared to other universities. Most of the participants agreed that there could be improvements in their work conditions (M=3.94, SD=1.04). Some, but not all, stated that the surroundings of their institutions were not very pleasant.

Most of the items related to the administration and support factors showed moderate agreement. These factors included the assistance they receive from the administration, the administration's ability to communicate their policies, and their equitable treatment to all the instructors and other employees in the institution. The recognition items, however, indicated more of a disagreement although the responses varied. Many instructors underlined the importance of being recognized for the work they do and that they do not receive the recognition they deserve from the

administration ($M=3.03$, $SD=1.21$). Similar results were obtained when the instructors were asked if they received suggestions from the administration when it comes to improving their teaching ($M=3.14$, $SD=1.13$). They also disagreed with the statement “The administration praises good teaching” with a mean of 2.94 ($SD=1.27$).

The instructors reported great agreement with being responsible for planning their daily lessons and feeling the responsibility for their teaching practices. However, they did not agree as greatly that they were able to make decisions freely ($M=3.00$, $SD=1.33$), which highlights the fact that they do not have much teacher autonomy.

Last but not least, the participants expressed their strong agreement with the statements related to their positive relationship with their colleagues ($M=4.31$, $SD=0.77$) and the fact that their colleagues encourage them to perform better as a teacher with a mean of 3.81 ($SD=0.98$). With even a higher mean score of 4.56 and a standard deviation of 0.65, the participants stated that they had good and positive relationships with their students. Nonetheless, they expressed their financial insecurity working as a teacher and that they had concerns related to their future as teachers.

The last section of the survey was an open-ended question aiming to collect qualitative data and to triangulate the results. One third of the participants volunteered to express their opinions and share their experiences. A theme that recurred was the salary and benefit issue; many participants stated that although it is a critical profession when the future of the country is considered, they did not earn enough to get by, and it affected them as teachers. They underlined the fact that “in Türkiye, teachers are not well-paid, and the purchasing power is shrinking day by day”. They also emphasized the rewarding nature of teaching, considering the intrinsic motivation teachers have when they see students’ success. Some of the participants touched upon the workload by highlighting their need to have some time to relax and “progress in their hobbies” and maintain the “work-life balance”. The importance of teaching as a profession and teacher wellbeing were also underlined by two participants who reported that “Teacher wellbeing is crucial in terms of sustainability of quality education” and “When you are not satisfied with your institution, all you can focus on is your students’ future and that they acquire what is expected from them”.

The data gathered from the participants and the findings are mostly in alignment with the research done so far on teacher wellbeing and job satisfaction. There are, indeed, context-specific factors that impact teacher wellbeing and job satisfaction for the sample of this study, as well. Teachers’ relationships with their students, colleagues, and their administrators have proven to have a positive correlation with teacher wellbeing and job satisfaction. Similarly, as another source of intrinsic motivation for teachers, having the confidence of subject matter knowledge and meeting the learning goals of students translate to high self-efficacy, and consequently, to higher teacher wellbeing and job satisfaction. The meaning attributed to teaching as a profession, that it is an interesting work where they can use various skills, and the creative nature of it are other factors affecting wellbeing and job satisfaction positively.

Nevertheless, factors impacting teacher wellbeing and job satisfaction adversely cannot be disregarded. The inadequate salary and benefits teachers get in Turkish educational context causes them to have concerns for their future as teachers and demotivates them. Time constraints with their current workload, having to complete administrative tasks in addition to their weekly lesson hours, and having difficulties balancing work and life lead them to feel overwhelmed by extrinsic factors which may cause stress, burnout, and anxiety.

In a nutshell, it can be concluded from the findings of the study that overall job satisfaction can enhance teacher wellbeing. Teacher autonomy and self-efficacy, support from colleagues and administrators, as well as the freedom to take part in the decision-making processes of the institution, correlates positively with teacher wellbeing. It is vital to improve teachers' motivation by focusing on the extrinsic factors for teacher wellbeing and sustainable quality education.

5. Conclusion

Looking at the key findings, it can be stated that sources of intrinsic motivation such as good rapport with students and colleagues, teacher autonomy and self-efficacy, teachers' possibility to use various skills as well as their creativity affect both teacher wellbeing and job satisfaction positively in Turkish tertiary-level EFL contexts. On the other side of the coin, teachers feel demotivated and dissatisfied with their jobs when they are not recognized for their work and effort, when they are overwhelmed by workload and administrative tasks, and when do not get the means to develop professionally or the support they need to improve their teaching.

All stakeholders including institutions, administrations, policymakers, and teachers can address the challenges in the enhancement of teacher wellbeing and job satisfaction. Institutions and administrations should find ways to appreciate teachers for their hard work and support them in areas where they need both personally and professionally. The working conditions should be aligned with the capacities of teachers and the workloads should be manageable so that teachers do not feel stressed and burdened. Policymakers should address the inadequate salary and benefits issue so that teachers feel secure and unworried for their future. Lastly, teachers can work on their emotion regulation and improve themselves professionally and get support from their colleagues to make sure they feel confident and have a sense of self-efficacy.

There are, indeed, limitations to this study. The sample size of 35 participants limits the generalizability of the results; that is, they may not represent a large population of EFL teachers. The results may be context-specific, data can be collected from not just foundation universities, but from public and private universities, as well. Structured or semi-structured interviews may be conducted to avoid from the biased that can be caused by self-reported data. Consequently, future research could be done with larger samples from a larger population so that the results are more generalizable. Longitudinal studies, instead of cross-sectional studies could be conducted to see the results of the interventions made to enhance teacher wellbeing and to improve the working conditions of teachers.

In conclusion, the importance of teaching as a profession should be acknowledged so that the future generations can be adults who benefited from quality education. Identifying and addressing factors affecting teacher wellbeing and job satisfaction is vital to ensure sustainability in education.

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Foreign Language Teachers' Job Satisfaction in Face-to-Face versus Online Settings

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Abstract

Following the declaration of COVID-19 pandemic in March 2020, various human affairs including education experienced dramatic transformations. Plans were put into practice promptly so that learning could be resumed after a brief halt. Educators, learners, and the administrative sector of the educational entities were hence affected. The present study aims to examine and compare factors that influence online and face-to-face job satisfaction among teachers of foreign languages. It will probe into various elements that have a role in the sense of professional satisfaction for foreign language teachers in a private K-12 school in Turkey. It will also try to discuss the issues that perturb the educators' job satisfaction in online learning. To this end, a combination of qualitative and quantitative tools including questionnaires and interviews is used to collect data. Findings suggest that the online education program has drastically decreased the educators' job satisfaction due to the absence or dilapidation of certain factors. Such issues will be discussed, and the study will attempt to set forth possible solutions to improve the conditions for teachers both professionally and personally.

Keywords: *Job Satisfaction, Online Education, Foreign Language Teachers (FLT), COVID-19 Pandemic*

LIST OF ABBREVIATIONS

EFL	English as a Foreign Languages
ELT	English Language Teaching
FL	Foreign Language(s)
FLT	Foreign Language(s) Teaching
F-to-F	Face-to-Face
IT	Information Technology
JS	Job Satisfaction
LMS	Learning Management System
MSQ	The Minnesota Satisfaction Questionnaire
SD	Standard Deviation

1. Introduction

This study examines job satisfaction (JS) among foreign language teachers (FLT) in both face-to-face (F-to-F) and online education within a private K–12 school in Turkey during the COVID-19 pandemic. Grounded in the Minnesota Satisfaction Questionnaire (MSQ), it explores intrinsic (e.g., autonomy, achievement) and extrinsic (e.g., salary, workload) factors influencing teacher well-being and motivation.

Defined as a positive emotional response to one's work (Martins & Proença, 2014), JS significantly impacts teacher retention, commitment, and student outcomes. Despite its importance, limited research addresses FLT satisfaction across instructional modes, particularly in Turkish private schools. This study addresses this gap by comparing JS in online and F-to-F contexts.

The research asks:

1. What factors affect FLT's JS in online education?
2. In F-to-F education?
3. How do these factors compare?
4. What are teachers' preferences and suggestions?

The author's insider perspective adds depth to this underexplored area.

2. Literature Review

Job satisfaction (JS) has been studied since the early 20th century, beginning with Hoppock (1935) and the Hawthorne experiments, which linked supervision and morale to productivity (Jamal, 2014). Mid-century theories such as Herzberg's Two-Factor Theory (1959) and Hackman & Oldham's Job Characteristics Model (1975) laid the foundation for modern understanding of JS. Later frameworks like Affective Events Theory (Weiss & Cropanzano, 1996) connected workplace experiences to emotional and attitudinal outcomes.

In educational contexts, JS research has focused on leadership, collegiality, and workload (Hulpia & Devos, 2009; Conley & You, 2017). However, specific studies on foreign language teachers (FLT)—especially in private schools—remain limited.

The shift to online learning during the COVID-19 pandemic intensified interest in JS in digital settings. Scholars noted both advantages (flexibility, tech support) and challenges (isolation, tech issues, lack of training) (Borup & Stevens, 2016; Fauzi & Khusuma, 2020). Findings were often mixed, reflecting diverse individual experiences.

FLT present unique JS profiles. Research emphasizes the role of autonomy, student rapport, workload, and institutional support (Afshar & Doosti, 2016; Jiang & Dewaele, 2019). Factors such as burnout, compensation, gender, and professional development also significantly affect satisfaction levels (Safari, 2020; Göker, 2012; Çakıroğlu, 2017).

3. Methodology

This study employed a mixed-methods design, combining quantitative surveys and qualitative interviews to explore JS among FLTs in online and face-to-face (F-to-F) settings during the pandemic. The quantitative phase used two customized versions of the Minnesota Satisfaction Questionnaire (MSQ), each with 20 Likert-scale items focused on context-specific factors like autonomy, support, and tech infrastructure.

The qualitative phase involved semi-structured interviews with selected participants to provide deeper insights. Interview themes were analyzed alongside survey results for triangulation and contextual validation.

Setting & Participants

Research was conducted at Bahçeşehir Koleji, a bilingual private K–12 school in Istanbul. Fifty-eight FLTs (English, French, Spanish, German) participated, all with experience in both modalities. They represented diverse ages (24–48), nationalities (e.g., Turkish, Canadian, South African), and academic backgrounds.

Sampling Strategy

Quantitative sampling was broad and inclusive, while interview participants were selected purposefully to reflect varied demographics, languages taught, and JS levels.

Instruments

The MSQ provided a validated framework for measuring JS. Surveys were adapted for each teaching context (online vs. F-to-F), ensuring relevance to pandemic-era conditions. Interviews added qualitative depth, enabling exploration of nuanced perspectives.

4. Data Analysis and Findings

Quantitative data were analyzed through descriptive statistics and correlation analysis, while qualitative interviews underwent thematic analysis, identifying themes such as teacher autonomy, support systems, emotional engagement, professional identity, workload, and flexibility.

In online education, salary (100% rated “important”), quality of online platforms (96.5%), advancement opportunities (91.2%), and student participation were highly valued. Overall satisfaction was positive (average scores 3.32–4.00), but interpersonal aspects like coworker relationships scored lower. Interviewees stressed the importance of technical support, training, and engaging digital materials (Gu et al., 2022; Ertmer & Ottenbreit-Leftwich, 2010). Workload and blurred work–life boundaries were particular challenges online (Allen et al., 2015).

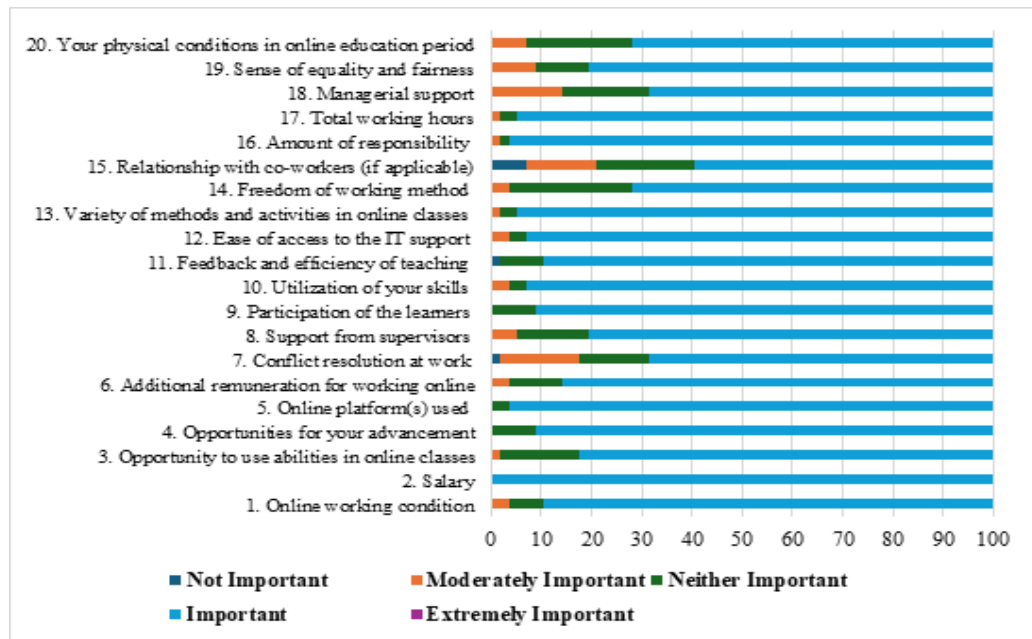


Figure 1. Stacked Barplot of Frequency Responses to Online Questionnaire

In face-to-face (F-to-F) teaching, salary, variety in teaching methods, managerial support, and student motivation were top factors, with satisfaction scores slightly higher than online (3.51–4.00) (Kyriacou, 2001; Klassen & Chiu, 2010). Healthy workplace dynamics and fairness emerged as critical for satisfaction (Aliakbari et al., 2020).

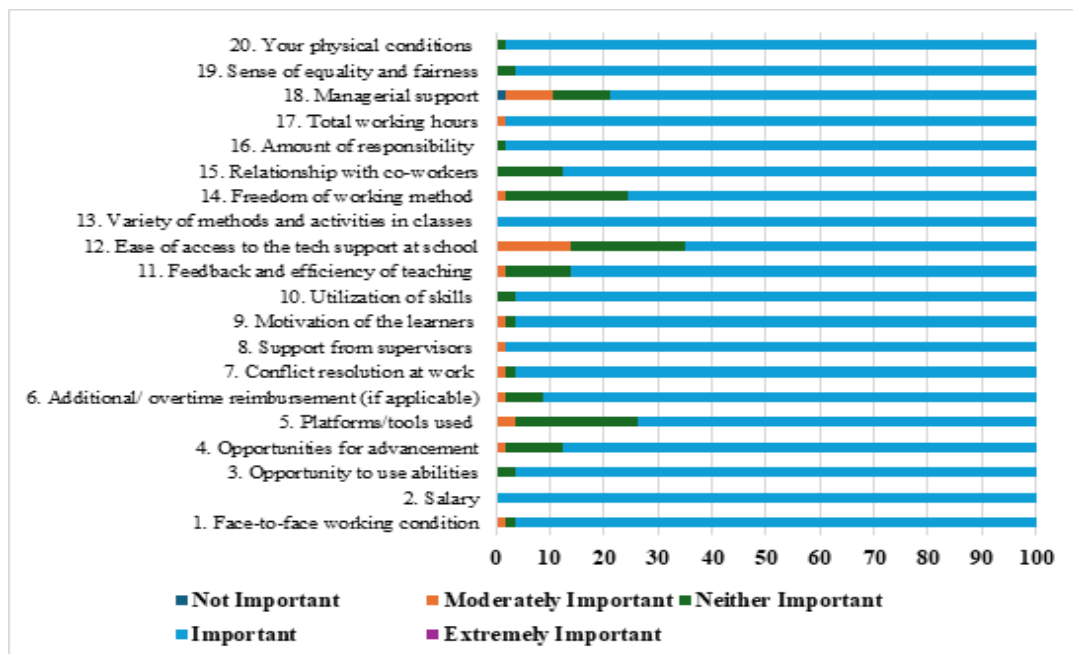


Figure 2. Stacked Barplot of Frequency Responses to F-to-F Questionnaire

While many factors affect job satisfaction across both modes, technological infrastructure is uniquely vital online, whereas interpersonal interaction and classroom management play stronger roles in F-to-F contexts. Teachers favored F-to-F teaching for richer human interaction but appreciated online flexibility (Brouwer & Korthagen, 2005; Reeve, 2013).

Table 3. *Correlation Analysis of Age, Job Tenure, and Professional Experience with Total Scores in Online Education*

Factors	Total scores	Pearson correlation coefficient		P-value	Spearman correlation coefficient	
		r	(95% CI)		rho	(95% CI) P-value
Age	Online education	-0.15	(-0.40, 0.11)	0.255	-0.16	(-0.41, 0.11) 0.223
How long have you been on your present job?	Online education	-0.03	(-0.29, 0.23)	0.830	-0.06	(-0.32, 0.21) 0.665
How long have you worked in this profession in total?	Online education	-0.02	(-0.28, 0.25)	0.906	-0.06	(-0.33, 0.21) 0.642

Note: Estimation of CI is based on Fisher's r-to-z transformation and estimation of standard error is based on the formula proposed by Fieller, Hartley, and Pearson.

Table 4. *Correlation Analysis of Age, Job Tenure, and Professional Experience with Total Scores in Face-to-Face Education*

Factors	Total scores	Pearson correlation coefficient		P-value	Spearman correlation coefficient	
		r	(95% CI)		rho	(95% CI) P-value
Age	Face-to-Face education	-0.17	(-0.41, 0.09)	0.197	-0.19	(-0.43, 0.09) 0.168
How long have you been on your present job?	Face-to-Face education	-0.01	(-0.27, 0.25)	0.927	-0.03	(-0.30, 0.24) 0.802
How long have you worked in this profession in total?	Face-to-Face education	-0.04	(-0.30, 0.23)	0.788	-0.02	(-0.29, 0.25) 0.886

Note: Estimation of CI is based on Fisher's r-to-z transformation and estimation of standard error is based on the formula proposed by Fieller, Hartley, and Pearson.

5. Conclusion

The COVID-19 pandemic transformed education, revealing that FLTs in Turkey's private schools prioritize salary and working conditions universally, while factors such as technology and learner engagement vary by mode. Intrinsic motivators like autonomy and collegial support remain essential (Deci & Ryan, 2000; Darling-Hammond, 2009). To enhance job satisfaction, institutions should invest in digital infrastructure, targeted professional development, supportive environments, and fair recognition (Goker, 2012; Safari, 2020). Future research should broaden scope and examine further contextual variables to support policy and practice improvements.

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AI as a Cultural Bridge: Enhancing Intercultural Communication Competence in Higher Education

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Abstract

With the pressure of accelerating globalization, higher education is faced with an imperative: how to prepare students to succeed in multilingual, culturally diverse, and technologically mediated environments. As Intercultural Communication Competence (ICC) has been welcomed as a quintessential 21st-century competence, traditional pedagogical frameworks often neglect to provide learners with the dynamic, real-time, and contextually responsive exposure crucial to the development of these capacities. This study addresses the critical challenge of intercultural theory-practice gaps in higher education environments by combining Artificial Intelligence (AI) with ICC instruction. Employing a qualitative case-study design, this study examines the ways in which AI-powered tools such as culturally responsive chatbots, AI-powered virtual exchanges, and adaptive language learning software are being utilized to simulate authentic intercultural scenarios, provide individualized feedback, and promote critical thinking. Examples are taken from real teaching environments and locations like Duolingo, Soliya, TalkAbroad, and AI-based role-play simulations. Consequences are that use of AI significantly enhances ICC acquisition by making the learner engaged, bridging geographical and linguistic divides, and providing customized culture-enriched learning paths. However, the study identifies that there remain some issues: asymmetrical access to AI resources, stereotyping cultures, data bias, and over-demand for teacher training. Lastly, this study advocates for a role shift for teachers—from content conveyer to intercultural guide—and proposes a model where human expertise and AI work together to build networked, ethical, and inclusive learning environments.

Keywords: *Artificial Intelligence, Intercultural Communication Competence (ICC), Higher Education Innovation, Culturally Responsive Pedagogy, AI-Education Ethics*

1. Introduction

Amid increasing globalization and digitalization of our era, higher education is faced with a paradigm shift. Universities are not only needed to equip learners to thrive professionally, but also to be successful participants in multilingual, multicultural, and technology-mediated environments (Choudaha, 2022; Zhao & Watanabe, 2023). Among the competences of the twenty-first century, Intercultural Communication Competence (ICC) is a core competence for global citizenship, inclusive interaction, and cross-border collaboration (UNESCO, 2021; Dervin, 2023).

Despite growing consensus that intercultural competence is the most important, conventional curricula in most universities fail to provide learners with engaging, interactive, and context-specific learning experiences to develop deep intercultural competence. Conventional pedagogies, founded on lectures, textbook materials, or short exchange programs, are not able to reflect the real and dynamic nature of authentic intercultural experience (Guo & Guo, 2022). This disconnection between theory and practice demands innovative pedagogical designs that possess the potential to mediate between theoretical intercultural knowledge and performative communicative practice.

Recent developments in Artificial Intelligence (AI) hold promising solutions to this challenge. AI tools, including intelligent chatbots, adaptive language learning platforms, and virtual intercultural exchange systems, are now being used to simulate actual intercultural contexts, deliver real-time personalized feedback, and facilitate critical cultural reflection (Holmes et al., 2021; Yang & Lin, 2023). Not only do they spread intercultural education across physical distances, but they also offer virtual and flexible learning spaces to accommodate different learner profiles.

The research investigates AI use in ICC training at the university level. Based on qualitative case studies of Duolingo, Soliya, TalkAbroad, and AI-based role-play simulations, the research analyzes how the tools facilitate ICC development, their pedagogical affordances, and challenges they create. While findings promise the potential for AI to strengthen student engagement, foster reflection, and enable multilingual communication, they also reflect anxieties concerning algorithmic prejudice, stereotyping, unequal accessibility, and educators' preparedness to incorporate such technologies effectively (Zawacki-Richter et al., 2022; Beardsley & Younas, 2024). Lastly, this study invites remapping teacher work—not anymore knowledge transmitters but intercultural facilitators who, together with AI, codevelop moral, just, and world-responsive learning spaces. This study contributes to the growing body of literature sitting AI not only as a technological tool but as a pedagogical companion in mapping the future of intercultural education in the age of digital.

2. Literature Review

Intercultural Communication Competence (ICC): Theoretical Foundations

Intercultural Communication Competence (ICC) entails the ability to communicate appropriately and effectively with other cultures' people (Byram, 1997; Deardorff, 2006). New models such as Byram's five *savoirs* (attitudes, knowledge, interpreting/relating skills, discovery/interaction skills, and critical cultural awareness) encompass both cognitive and affective aspects of intercultural competence. Similarly, Deardorff's (2006) process-oriented model emphasizes being flexible, empathetic, and reflective in the building of ICC.

Scholarship in the recent past still vindicates the pertinence of ICC to global higher education, i.e., how institutions struggle to introduce students to transnational mobility and worldwide employability (Dervin, 2023; Guo & Guo, 2022). Although these models enjoy a solid theoretical framework, classroom application remains inconsistent, mainly because they fail to include experiential, dialogic, and culturally authentic practices.

Challenges of Teaching ICC in Higher Education

Despite institutional involvement, the university education of ICC remains confined by various long-standing challenges. To start with, most pedagogical approaches remain decontextualized texts, low student-to-student contact, and Eurocentrism (Choudaha, 2022). Second, the absence of effective intercultural contact limits students' ability to change from cultural consciousness to cultural action (Jackson, 2020). Even in intercultural or study abroad modules in programs, privileged students are usually excluded, and inequality is perpetuated rather than inclusive global learning (UNESCO, 2021).

Further, the lack of sufficient numbers of competent teachers of intercultural pedagogy is also a structural barrier. Sercu (2005) states that foreign language teachers do not get proper training in intercultural theory or in-the-field participatory engagement methods, so that ICC gets pushed into the background or is taken out of curriculum altogether. Hence, there is a growing need for more scalable, interactive, and adaptive ICC pedagogic remedies that accommodate varying learner needs and sociocultural contexts.

Artificial Intelligence and Language and Intercultural Learning

Rapid emerging advances in AI technologies present new promises to enhance ICC instruction beyond some of these structural and pedagogical limitations. AI-powered tools, including virtual exchange platforms, intelligent chatbots, and interactive learning environments—can simulate authentic intercultural encounters, provide tailored feedback, and enhance access to rich and diverse culturally configured learning spaces (Holmes et al., 2021; Zawacki-Richter et al., 2022).

These types of apps, for instance, Duolingo and Mondly, now encompass cultural context along with language learning, whereas programs like Soliya and TalkAbroad enable synchronous virtual conversation between students from diverse cultures. These AI-supported platforms enable ICC development by providing immediate feedback, context-specific vocabulary, detection of emotional intelligence, and even simulation of cultural scenario (Yang & Lin, 2023). In addition, AI presents ever more frequently to facilitate critical thinking, one of the defining aspects of ICC. For instance, AI-simulated role-play environments provide learners with space to experiment and reflect on culturally appropriate interaction in a low-stakes, safe context. Adaptive models of feedback allow learners to adjust their output in the moment, and thus also provide linguistic appropriateness along with cultural appropriateness (Lee, 2021; Kohnke et al., 2023).

Ethical Considerations and Challenges in AI-Supported ICC Instruction

Although AI provides rich pedagogical affordances, there are a number of issues to be addressed. First, algorithmic and cultural bias built into AI systems can reinforce stereotypes or normalize hegemonic norms, thereby discrediting the very intercultural sensitivity that they are intended to promote (Beardsley & Younas, 2024). Second, differential access to digital infrastructure means that not all students are treated on an equal basis by AI-mediated learning, thereby raising issues regarding digital equity and inclusion (Zhao & Watanabe, 2023).

Apart from this, there are not many pedagogically trained educators who can embed AI tools into their teaching in pedagogically sound ways. Media reports that with increasingly prevalent AI in education, AI gets utilized with inadequate pedagogical support, resulting in shallow or inappropriate application (Zawacki-Richter et al., 2022). This suggests double necessity: upgrading the teacher as intercultural mentor and respectfully co-teaching with AI as co-educator and not as objective device.

Towards a Pedagogical Human-AI Model for ICC

New scholarship calls for a rethinking of the role of the teacher in AI-facilitated environments. Rather than being replaced by AI, teachers are challenged to become mediators and facilitators of intercultural exchange, working together on experiences that integrate human cognition with algorithmic personalization (Canagarajah, 2013; Baker, 2018). The vision of human-AI collaboration inspires ethical, context-aware, and student-centered pedagogy based on inclusivity and cultural competence. Through employing AI as a collaborator, rather than a replacement, companies can begin closing the gap between theoretical models of competency and reality of global communication in practice.

3. Methodology

This study applies a qualitative thematic study design in the investigation of how Artificial Intelligence (AI) technologies are integrated into the development of Intercultural Communication Competence (ICC) in university education. Qualitative research is appropriate to the discovery of participants' depth, richness, and local context of experiences, particularly those involving new technologies and intercultural learning (Creswell & Poth, 2018). Instead of hypothesis testing or the measurement of effects, this study aims to achieve interpretive conclusions about students' and teachers' perception and application of AI-enabled intercultural tools.

The study attempts to respond to the following exploratory questions:

How do students and teachers conceptualize the role of AI in facilitating ICC learning?

What are the elements in AI tools that are thought to facilitate or hinder ICC growth?

What are the limits, constraints, or ethical concerns in integrating AI into intercultural education?

The participants were sampled by purposive sampling, finding individuals with direct experience of applying AI-facilitated learning platforms for intercultural or language learning. The final sample included:

12 university students majoring in language education, global studies, and intercultural communication.

4 university professors who have incorporated AI tools (e.g., chatbots, adaptive language platforms, virtual exchanges) into their teaching.

Recruits were registered from three Algerian institutions: Laghouat University, ENS Constantine ENSC, Sidi Bel Abbes University SBA,

Data were collected using the following qualitative techniques

Semi-structured interviews: Participants were interviewed individually (45–60 minutes), face-to-face or over Zoom. They were asked about their experience with AI tools (e.g., Duolingo, TalkAbroad, Soliya), benefits to intercultural competence, and fears or limitations faced.

Platform interaction observation: Where possible, participants took the researcher through the AI platforms during interviewing, explaining how they use a specific feature, e.g., feedback loops, dialogue simulation, or cultural cues.

Reflexive field notes: Field notes were taken by the researcher during and after interviews to take notes of contextual information, tone of the interviewee, and non-verbal reactions.

All the interviews were tape-recorded with consent, transcribed verbatim, and anonymized to maintain confidentiality.

The data were analyzed by thematic analysis, adhering to the six-step model that Braun and Clarke (2006) proposed:

Familiarization of interview transcripts and notes.

Initial coding of most frequent sentences and usage patterns of AI, intercultural consideration, and engagement.

Identification of themes like "AI as a facilitator of cultural exposure," and "Learner autonomy and personalization."

Confirmation of themes with the entire dataset for consistency.

Determination and naming of themes in terms of theoretical saturation.

Preparation of the final report, based on verbatim quotes of participants.

Analysis was interpretive rather than descriptive and aimed to account for participants' experiences within the context of intercultural learning theory and digital pedagogy. Thematic categories were inductively derived though guided by previous research on ICC and AI education.

To secure maximum trustworthiness, the following measures were followed:

Member checking: Participants verified their transcripts and thematic summaries.

Peer debriefing: Two peers familiar with AI in education were consulted to reduce interpretive bias.

Audit trail: All decisions regarding codes and analytic memos were recorded to ensure maximum transparency.

Most importantly, the study followed institutional ethical principles and informed consent, anonymity, and voluntariness principles. The participants were advised of their right to withdraw anytime, and the data were stored safely under data protection regulations.

4. Main Findings

Thematic analysis of platform participation sessions and interviews revealed four overarching themes to show how Artificial Intelligence (AI) tools are impacting the formation of Intercultural Communication Competence (ICC) in higher educational settings.

AI as a Gateway to Cultural Exposure

A majority of the respondents cited AI technology as responsible for facilitating their access to a wide culturally diverse content and perspectives, especially in linguistically isolated environments. Virtual communication, chatbots, and interactive software allowed access to the potential of simulated intercultural communication and exchange.

"Prior to TalkAbroad, I never communicated with anyone outside of my region. It felt like traveling without leaving. The AI questions pushed me to talk about local customs that I never thought I'd explain before." Student 4, Laghouat University

"The Duolingo stories have little things, holidays or politeness, for example, those little cultural things taught me more than words." Student 7, ENSC

Members emphasized that these types of resources offered not just language practice but also context-based, real-life observations of cultural values, holidays, gestures, and norms—oftentimes absent from textbooks.

Personalisation and Learner Autonomy

Empowerment came up again and again. The students liked that AI personalized the difficulty level, gave them feedback in real-time, and permitted them to learn at their pace. Autonomy generated confidence and ownership in learning intercultural.

"The chatbot gave feedback immediately. I could retry without being embarrassed in front of a teacher. That autonomy made me want to practice more." Student 2, ENSC

"I liked being able to choose which culture-based scenario I wanted to do. It made me feel like I was managing my own learning and not getting through a set program of study." Student 9, SBA

Teachers also saw this shift towards independent learning as potentially a strength of AI-supported settings, but they reported several qualifications on whether this would occur.

Reimagining the Educator's Role

The application of AI to ICC instruction has revolutionized the anticipated role of the instructor. Instead of being the exclusive cultural information provider, instructors now position themselves as intercultural coaches—coaches who manage AI tasks and encourage reflection.

5. Discussion

This paper's findings underscore the innovative but contentious role of Artificial Intelligence (AI) in improving Intercultural Communication Competence (ICC) in higher education. By situating teacher and learner experiences within realistic AI-augmented learning settings, this

analysis unpacks how AI-facilitated technologies expand intercultural prospects and subvert norms around teaching and moral responsibilities. The four themes necessary—cultural immersion, student autonomy, cultural authenticity, and the evolving teacher role—are defined relative to relevant literature.

AI as an Expanding Gateway to Cultural Experience

Consistent with past studies (Holmes et al., 2021; Zou et al., 2023), the participants concurred that AI systems take intercultural content to scale, especially where there is limited direct foreign access. Virtual exchange sites like TalkAbroad and AI-powered chatbots act as substitutes for authentic intercultural communication, allowing students to mimic real communication with an interlocutor from another culture. This would be in line with experiential learning theory (Kolb, 1984) in assuming that intercultural competence is best learned through contextually experienced life and not abstractly. The inclusion of culturally inflected activities by Duolingo and other websites would be a confirmation that the concept technology can serve as a cultural mediator is indeed feasible, particularly if it exposes learners to situations where they must question their own values and compare them with others' (Jackson, 2020).

Personalisation and the Development of Learner Agency

Personalization of students and self-regulation were of top priority, substantiated by research work on adaptive learning and self-regulated language learning (VanLehn, 2011; Shute & Zapata-Rivera, 2012). Students indicated they could make choices independently with AI-driven systems, read feedback independently, and attain balance between culture without fear of failure or criticism. Such studies indicate the revolutionary potential for AI as an independent self-taught intercultural tutor, offering scaffolded interaction building linguistic and cultural proficiency. Individualized learning, however, is only justified if culturally responsive material directs it or else risk reproducing dominant norms and superficial interaction, according to Beardsley and Younas (2024).

The Trap of Cultural Simplification and Algorithmic Bias

Though exposure is offered by AI, research indicates limitations in authenticity and inclusivity. Some students perceived cultural scenarios as formulaic or Western-normative biased, a charge Zawacki-Richter et al. (2022) make, warning that algorithms trained on dominant language corpora will marginalize underrepresented voices.

This raises some urgent cultural curation questions in AI design: Who is determining which cultural practices are represented? How can AI assist with the diversity, fluidity, and complexity of real intercultural interaction? As Dervin (2023) has recently reminded us, intercultural education must move beyond "cultural tourism" to challenging thinking.

Without human intention, AI tools will simply replicate the ethnocentrism ICC seeks to eliminate.

Redefining the Role of the Educator

Above all, perhaps, the study indicates a paradigm shift in teaching. Teachers are no longer sole transmitters of cultural knowledge; rather, they are interpreters, guides, and reflective facilitators who lead students through AI-mediated intercultural content. This serves to complement Canagarajah's (2013) model of translingual and transcultural pedagogy where educators facilitate students' movement between linguistic and cultural models with ease, seeking meaning in context rather than from prescriptivist correctness. In the AI-enabled classroom, the educator is still responsible for questioning material, injecting humanity into online dialogue, and making sure that technology is accountable to equity, empathy, and ethical communication.

Implications for Practice

Curriculum design needs to integrate AI technologies with reflexive guidance in a way that inspires students to critically interact with intercultural materials.

Teachers must immediately be trained to get their educators ready to assess, adapt, and ethically deploy AI technologies.

AI platform developers must co-design with intercultural teachers to create AI experiences that are representative of global diversity and not tokenizing cultures.

This study contributes to the growing body of literature situating AI not just as a vehicle for content delivery, but more so as an intercultural co-constructive pedagogy ally. This study validates that while AI can mimic culture and allow adaptive learning, success is contingent upon human facilitation, pedagogical intent, and ethical control.

6. Conclusion and Recommendations

This study investigated how Artificial Intelligence (AI) technology can be incorporated in the higher education curriculum design of Intercultural Communication Competence (ICC). Based on thematic analysis and qualitative interviewing, it has shown that AI platforms, from adaptive language software to AI-facilitated virtual exchanges, possess strong pedagogic affordances. These include diversifying access to multicultural experience, increasing learner autonomy, and allowing personalized learning experiences that map onto real-world intercultural contexts.

But research also uncovers staggering limitations. Despite being promising, AI systems risk oversimplification of cultural stories or reinforcement of dominant cultural norms and thereby risks of cultural stereotyping and bias. Additionally, not all instruction is as well positioned to take advantage of these technologies optimally, while numerous students lack equal access to digital infrastructure to fully participate. Thus, the teacher's role remains pertinent—not as a technology facilitator, but as an intercultural coach who can place the online learning experience, critically evaluate it, and make it human.

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Briefly, the study imagines a co-constructive position whereby human pedagogy and AI are synergistic—where algorithms facilitate scalable and flexible support, but teachers provide ethical discernment, cultural sensitivity, and reflective discussion. Human-AI collaboration represents an exciting way of building inclusive, international, and ethically dense higher education environments.

Based on the outcomes of this study, several recommendations are presented to enhance the adoption of Artificial Intelligence (AI) in Intercultural Communication Competence (ICC) education at universities. First, AI tools should be integrated into ICC courses in such a way that they go beyond language learning to include culturally rich, scenario-based, and reflective learning exercises. Educators must receive specialized professional preparation to examine and implement AI in an ethical manner in intercultural contexts. At the same time, AI developers must collaborate with intercultural scholars to integrate cultural diversity, prevent stereotyping, and promote inclusivity in AI-generated content. Organizations must prioritize digital equity by providing the requisite technological infrastructure to all. Moreover, teaching methods like facilitated discussion and critical reflection diary writing must be integrated in AI application for the development of cross-cultural competency. Longitudinal and cross-cultural studies, especially in the long term, must also be conducted in order to inspect the long-term effect and versatility of AI-delivered ICC training in various international settings.

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I-See-Bytes: A Simplified C++ Library for Concurrent Programming Education

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Abstract

Concurrent programming is one of the most difficult subjects to teach at the undergraduate level. Parallel algorithms that access the same resources asynchronously and communicate with each other to synchronize their behavior is difficult to grasp. Multithreaded programming techniques are mostly used in server applications which are written in C++. However, most universities focus on teaching Python or Java languages, making the instruction of concurrent programming in C++ even more difficult. In this study, a simplified C++ graphics library called I-See-Bytes is introduced. This library offers the conveniences offered by Python for variables in C++ and makes game programming and debugging easier. Classical concurrent programming assignments are altered to include graphics objects, making it not only visually more understandable but also more fun. The quality of the projects delivered by the students and the student survey results prove that this method is very successful.

Keywords: *Programming skills, C++ language, computer programming course, gamification, concurrent programming, visualization, Flow.*

1. Introduction

In his groundbreaking study, Csikszentmihalyi (1990) discovered a state of consciousness called “flow;” a state of concentration so focused that it amounts to absolute absorption in an activity. In order for a person to get into this mental state, the task at hand must be satisfying but not too easy. It must be difficult enough to pose a challenge, but not unachievable. Researchers realized long ago (Finneran, 2005) that the computer is the perfect device to create challenge and excitement. There are many studies in the literature (Valinatajbahnamiri, 2021) using computers as the teaching media. An important component that facilitates creativity is visual artistry. Since creativity is the major fuel of “flow” state, researchers investigated ways of including visual artistry to the learning process (Cseh 2015). When it comes to teaching, visualization has been an undisputable method for elevating the satisfaction and efficiency (Naps, 2003). There are even attempts at creating visual simulators for teaching programming (Repenning, 2016). Kraidy (2002) argues that using visualization and media increases the focus and attention of the students. Interactive visualizations increase these benefits even further (Firat, 2018). In other words, gamification of the learning process takes boredom out of education.

Since the computer science education is already performed using computers, and they are the preferred media for creating flow, there are researchers who focus on creating flow experience during the computer science education. These researchers focus on creating tutorials for computer science students (Repenning, 2016).

Recent surveys (Siegfried, 2021), (Dennis, 2023) reveal that majority of the universities started using Python for their “Introduction to Programming” courses not only in CS, but also in other engineering programs. As a matter of fact, some researchers (Duffany, 2014) recommend using Python, Matlab or Octave (a Matlab clone) as the introductory programming language to all engineering programs. The reason for that is because these languages simplify the “variable type” concept in programming. The student is not bothered with whether a variable type is short or long, or even it is integer or floating point. This flexibility is extended further into more complex structures such as arrays and matrices. For example, in Matlab, the same variable can morph into a scalar, vector or matrix effortlessly. The fact that these languages also enable these variables to be displayed on the screen as easily makes them a superior tool for teaching introductory programming courses.

On the other hand, server programs are almost exclusively written in C++ because of the high speed of the executables produced by the C++ compilers. Servers consume considerable amount of processing power in order to serve hundreds of clients. Therefore, the speed of the server programs is vital for the quality of the service. Some tests performed by our students reveal that programs written in C++ run approximately ten times faster than the ones written in Python or Java. Therefore, it is counterproductive to use a language other than C++ for the instruction of concurrent programming. Unfortunately, C++ is a difficult language to work with. By the time CS students reach fourth year, they have no difficulty working with different variable types and complex structures any more. However, C++ has an issue that scares even the seasoned programmers. Unlike other languages, C++ does not give any errors when the programmer tries to read or write to an array element that does not exist. For example, if you have an array A [10], the C++ compiler will compile without any complaints if you read or write to array locations such as A [91] or A [-3]. However, if you try to run that program, it will crash without informing where the error is. Even as late as 2024, researchers have been investigating efficient ways to teach C/C++ language. For example (Glasauer 2024) investigates how C code snippets should be written in order to make them look less confusing to students. On the other hand (Rodríguez-Vidal, 2024) investigates the impact of C coding self-assessment exercises on learning.

A server must simultaneously host the needs of dozens of clients, perhaps thousands of them, each requiring similar but not exactly the same services. This requires the strict coordination of the limited resources of the server in order to attend the needs of the thousands of parallel routines.

Another field that requires multiple threads and/or timers is multimedia applications. Videos, graphics and sounds must be played not only simultaneously but also with perfect synchronization so that there is no delay between the words coming out of an actor and his lip movements.

A less known but equally frequent use of multithreaded programming is needed while using Windows GUI when any task requires more than a few seconds to complete. The underlying API of the Windows operating system, the (WINAPI), operates using messages (Simon,1996). If at any point the main thread of the program stops processing these messages the GUI

interface freezes. Therefore, using a second thread for operations lasting more than a few seconds is a must.

Unfortunately, it is very challenging for students to grasp the intricacies of the concurrent programming, especially at undergraduate level. For example, in Türkiye, dozens of universities include parallel programming course in the undergraduate curriculum of Computer Science (CS) (in Türkiye Computer Science programs are called Computer Engineering and Computer Engineering is called Electronics Engineering) but these courses do not include concurrent programming techniques. At the time of writing, Concurrent Programming course is only offered in graduate level (except for the author's university). As a matter of fact, researchers have been investigating ways to introduce concurrent programming at the undergraduate level since the late 90s (Feldman). This creates a problem for the Network Programming course which has become a standard for the CS undergraduate curriculum because there is not much point teaching students how to write server programs without them knowing the multithreaded programming.

The readers should be aware that, truly mastering the concurrent programming concepts takes more than one semester. The objective of the ideas presented in this article is that, by providing the students with a tool that motivates them to write multithreaded code, their introduction to this difficult concept can be made painless. Once they learn the basic concepts, they will be able to write small servers or multimedia programs and later in their lives, if they chose to do so, build upon their knowledge and become experts.

2. Literature Review

It is a well-known fact that gamification of the learning process is one of the best methods to motivate students. There are dozens of articles in the literature about this subject which are summarized in these reviews (Videnovik, 2023) (Krath, 2021). When it comes to teaching concurrent programming concepts, the prevailing approach in the literature is simulation or puzzle type games. The main objective of these approaches is to bestow the concepts of concurrent programming upon students by creating a problem in which entity movements are guided by the student to reach harmony and efficiency.

Marmorstein (2015) proposes using an open-source game, The Transport Tycoon, to create situations where the behavior of trains simulates the concepts such as race conditions and deadlocks. For example, he proposes creating a piece of railway shared by two different routes to simulate critical section. If the trains collide, that is analogous to two threads writing to memory at the same time. Inggs et al (Inggs 2017) designed two puzzles in which robot movements can be programmed by the students to turn on virtual light bulbs or signal each other to draw bridges over the lava. Another approach which could be described as functional simulator rather than a game is "Parallel" designed by Zhu et al (2019). They prepared puzzles that consists of paths and arrows representing threads and challenge students by designing signaling mechanisms to make the system work.

While these approaches are very useful for teaching students the concepts of concurrent programming, they are not capable of creating hands on programming skills or experience. The intricacies of concurrent programming cannot be learned without writing hundreds of

lines of code and several different applications. The Deadlock Empire (Hudecek, 2017) is one of the few games that requires the students to write or modify program code to solve the tasks or puzzles. Each of these games mentioned so far can be completed in a few hours, leaving concurrent programming classes of the rest of the semester unfilled. Obviously, there is room for a different approach in the literature that can not only fill the entire semester of classes, but also let students have fun while writing actual multithreaded C++ code.

3. Methodology

As mentioned earlier, teaching C++ is difficult. That's why many Universities chose to teach Python and Matlab. Therefore, the first step should be creating a new object in C++, which can be used as a morphable variable type, just like in Python and Matlab. The next step should be to add debugging tools to the library so that students can be warned about their mistakes because C++ does not warn the user about access violations. Finally, the last step should be to add graphics functions so that the students can spend their time on multithreaded programming rather than drawing game elements.

3.1. The Technology

In order to make the library easy to use, a new variable type is introduced. This variable is actually an object, capable of metamorphosis so that it can contain any complex data type at runtime. In reality, it holds an array of bytes but can interpret these bytes in different ways. That is where the name of the library originates: I-See-Bytes (Baykal 2023). The name of this class is an abbreviation of the name of the library: ICBYTES. This class can be initiated many ways as shown below:

```
ICBYTES A;  
A = 5.4; //Assign a floating point number  
A = -1; //Assign an integer  
A = "You can assign a string like this.";
```

Or during creation, an integer matrix can be copied into it:

```
ICBYTES A = { {1,2,3},{4,5,6},{7,8,9} };
```

Since this library is designed to be a graphics library, the most important data structure that needs to be implemented is the matrix. Digital images are held in memory as matrices. Therefore, there are many ways of creating matrices in I-See-Bytes library such as:

```
CreateMatrix (A, 5, 5, ICB_UINT); //5x5 32 bit  
CreateMatrix (A, 5, 5, 3, ICB_UCHAR); //5x5 24 bit  
CreateImage (A, 50, 50, ICB_UCHAR); //50x50 Grayscale
```

There is no difference between the plain matrix and an image matrix except for the fact that the image matrix can be displayed on the screen much faster but it also consumes more memory. Matrices can also be created by loading a digital image or copying one matrix into another:

```
ReadImage("Some_image.jpg", A);  
B = A;
```

3.2. Built in Diagnostics

As mentioned before, C++ compilers do not perform boundary checks on array statements. That is one of the main reasons why C++ is so much faster. If one creates an array A[10] and accesses its members using an index variable such as A[i], then one must be very careful to keep 'i' in the range of 0 and 9. The I-See-Bytes library strives to be very fast. Therefore, it does not perform boundary checks on matrices in the "RELEASE" mode. On the other hand, to help students pinpoint their mistakes, it performs these checks in the "DEBUG" mode and displays the results in a dedicated text window of the application during runtime.

In the I-See-Bytes library, the access to the elements of a matrix is achieved by writing a dot and a letter that denotes the type of the matrix after the name of the matrix. For example:

```
A.I(1,1)=5; //Set the first element of an (I)integer type matrix to 5.
A.C(2,3)=5; //Set the second column and third row element of a (C) char type
matrix to 5.
```

These examples reveal that unlike C++ arrays, where the valid indexes are between 0 and (n-1), I-See-Bytes matrices (and vectors) use an index range of 1 to (n). However, there is still the problem of keeping these indexes inside the dimensional limits of the matrix. To help diagnose such kind of mistakes, the I-See-Bytes library comes equipped with a diagnostic object called "diag."

At the beginning of the C++ file, after including the I-See-Bytes library, a statement must be included:

```
#include"icb_gui.h"
extern ICBDIAG diag;
```

Then the student must create a multiline edit window and submit its handle to the "dig" (short for diagnostics) object. The following code sample shows how easy it is to create programs with I-See-Bytes:

```
int MLE1;
void butonfunc();
void ICGUI_Create()
{
    //The name on the title bar
    ICG_MWTitle("DIAGNOSTiK");
    //size of the window
    ICG_MWSize(430, 300);
}

void ICGUI_main()
{
    ICG_Button(5, 5, 120, 25, "Buton1", butonfunc);
    MLE1 = ICG_MLEditSunken(5, 50, 250, 150, "", SCROLLBAR_V);
    diag.SetOutput(ICG_GetHWND(MLE1));
}
```

These two functions are enough to create a small application with a button and a multiline text (edit) window as shown in Figure 1-a. Every C++ program must have a main(.) function. In

the I-See-Bytes library, that function is called `ICG_main()`. In this function, a button and a multiline edit window is created. Afterwards, the handle of the multiline edit window, `MLE`, is submitted to the diagnostic object using the command:

```
diag.SetOutput(ICG_GetHWND(MLE1));
```

Once the edit window is created and the debug mode is selected as the mode of the compilation, we will start seeing diagnostic messages as shown in Figure 1-a. In order to understand what is going on, we need to see the function that is called when the “Buton1” is pressed.

```
21void butonfunc()
22{
23  ICBYTES a(__LINE__);
24  CreateMatrix(a, 5, 5, ICB_INT);
25  a.I(0, 0) = 5;
26  a.C(2, 3) = 4;
27  for (int y = 0; y < 50; y++)
28  {
29    a.I(5, 5 + y) = y;
30    ICG_printf(MLE1, "%d ", a.I(5, 5 + y));
31  }
32}
```

On line 23, an `ICBYTES` object, `a`, is created. However, during initialization, an integer is sent as an argument. This integer is a compiler macro (`__LINE__`) (Line Macro) which tells you at which line that piece of code is. This means that, the `ICBYTES` object, ‘`a`’, knows that it was created on the 23rd line of our `main.cpp` file. As shown in Figure 1-a, the first message tells us that an `ICBYTES` type object is created on line 23. The second line tells us that this object has expanded to 108 bytes. That is because we created a 5×5 integer matrix inside a ($5 \times 5 = 25$; 25×4 Bytes = 100 Bytes; + extra 8 Bytes = 108 Bytes). On the 25th line of this code, we see that `a` is accessed as an integer matrix but the indexes are 0 (`a.I(0,0)`). That is forbidden. Therefore, the third message starting with ‘(23)’ `x(0)` out of... states that the `x` dimension is outside the valid index limits. On the 26th line, the code tries to access an element of the matrix as “char.” Because the matrix was created as integer, the diagnostic

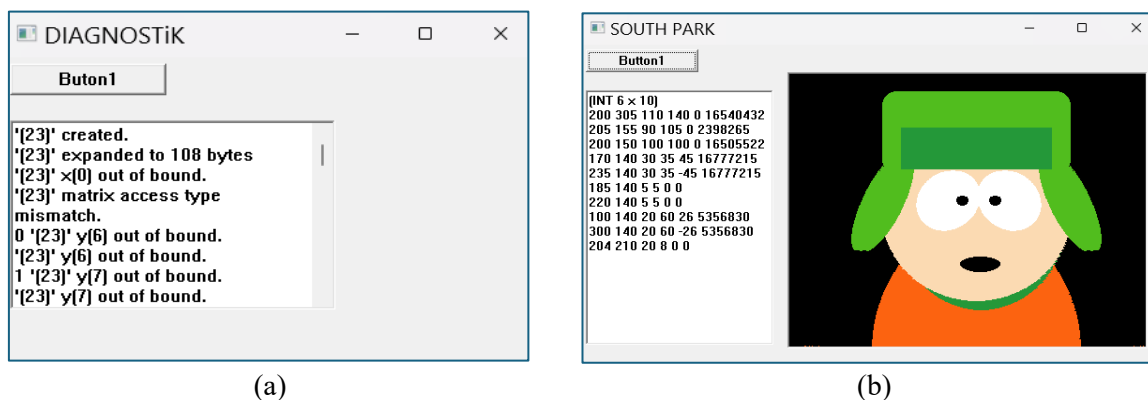


Figure 1. (a) A simple example demonstrating the built-in diagnostic abilities of the I-See-Bytes library. (b) An example demonstrating the graphics capabilities of the library.

system warns the student again that he or she is trying to access the matrix using the wrong type. In the rest of the code, the for loop tries to first write, then read the elements at the end

of the matrix. It succeeds only once, and then starts printing dozens of error messages indicating that the index of y dimension is outside the limits. If this program were to run in the “RELEASE” mode, it would immediately crash. On the other hand, in the “DEBUG” mode, the I-See-Bytes library prevents such bugs by performing boundary checks. Once these bugs are identified and removed by the student, the code compiled in the “RELEASE” mode generates extremely fast code and stops sending error messages to the window even when the code is left unchanged.

3.3. Graphics Functions

First of all, the greatest advantage of the I-See-Bytes library is its ability to create any kind of graphical user interface (GUI) very easily. Buttons, edit windows, check boxes, menus and image frames can be created with only one line of code. The I-See-Bytes library has many drawing functions that are common to any graphics library such as Line, Circle, Ellipse, Rectangle, Half Rectangle etc. These functions can draw on a matrix or an image matrix, and that matrix can easily be displayed on the screen. The following 23 lines of code is enough to create the application shown in Figure 1-b.

```
#include"icb_gui.h"
int MLE, FRM;
ICBYTES img;
void ICGUI_Create()
{
    ICG_MWTitle("SOUTH PARK");
    ICG_MWSize(640, 400);
}
void butonfunc()
{
    CreateImage(img, 380, 300, ICB_UINT);
    ICBYTES elpscor={{200,305,110,140,0,0xfc6310}, {205,155,90,105,0,0x249839},
    {200,150,100, 100,0, 0xfbdab2}, { 170, 140,30,35,45, 0xffffffff},
    {235,140,30,35,-45,0xffffffff}, {185,140,5,5,0,0x0},{220,140,5,5,0,0x0},
    {100,140,20,60,26,0x51bd1e},{300,140,20,60,-26,0x51bd1e},
    {204,210,20,8,0,0x0}};
    FillRoundRect(img, 100, 20, 200, 90, 15, 0x51bd1e);
    FillTiltedEllipse(img, elpscor);
    FillRect(img, 120, 50, 160, 10, 0x51bd1e);
    FillRect(img, 120, 60, 160, 45, 0x249839);
    DisplayImage(FRM, img);
    DisplayMatrix(MLE, elpscor);
}
void ICGUI_main()
{
    ICG_Button(5, 5, 120, 25, "Button1", butonfunc);
    MLE = ICG_MLEditSunken(5, 50, 200, 280, "", 0);
    FRM = ICG_FrameSunken(220, 30, 380, 300);
}
```

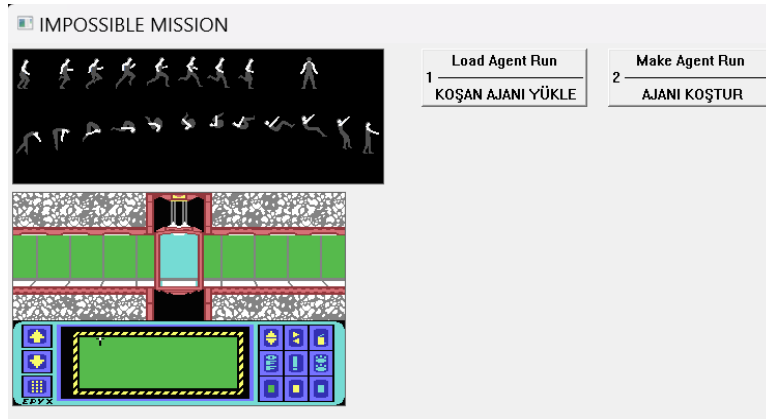


Figure 2. An example application displaying the sprite sheet and the background of 1980's popular arcade game *Impossible Mission* at its original resolution (320×240).

What makes the I-See-Bytes library unique is the graphics functions that support the sprite movement and animation. A sprite inside a smaller matrix can easily be pasted on a larger matrix (background). Animation is performed by continuously pasting, deleting and then pasting the sprite to a nearby location. The I-See-Bytes library has the ability to copy a small section of the background image and then paste it back. This allows the student to easily create sprite movement even on textured backgrounds. However, probably the most important feature of the I-See-Bytes library is its ability to extract sprites from sprite sheets.

A sprite sheet is a digital image showing different moves or perspectives of a sprite. Figure 2 and 3 show the screenshots of an application that loads the agent of the 1980's popular game “Impossible Mission” from a sprite sheet. Hundreds of different sprite sheets can be found on

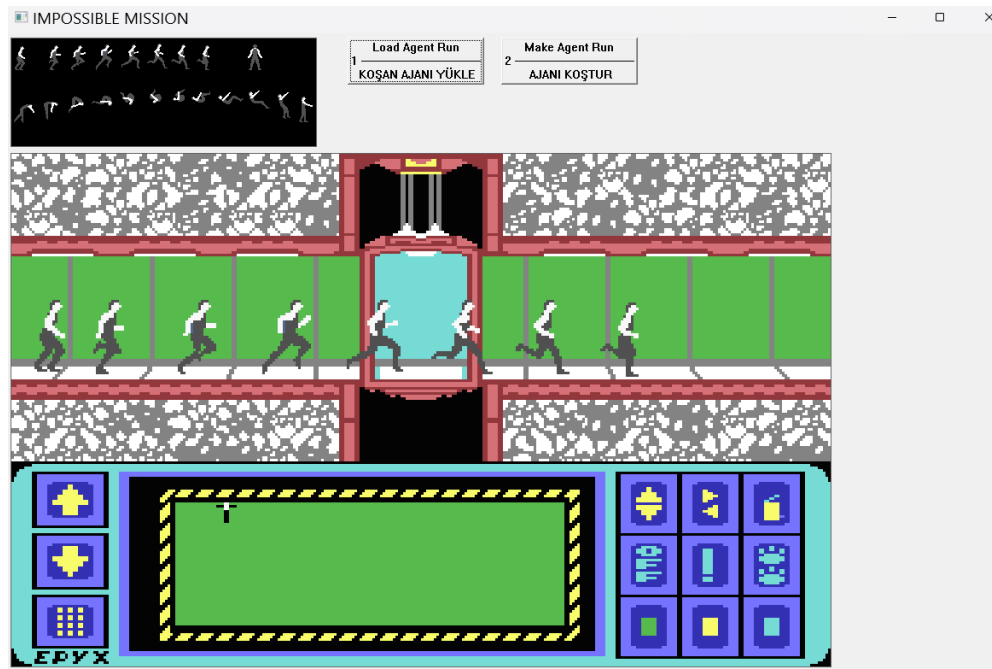


Figure 3. The screenshot of the application shown in Figure 2 after the “1-Load Agent Run” button is pressed. The running moves of the agent are cut from the sprite sheet and paste on the game background and then the entire image is magnified $\times 3$.

the internet that are published by the gaming enthusiasts.

4. Findings and Discussion

During the final class of the semester, students were asked to assign numbers between 1 and 10 to six statements indicating how much they agree with them. These are the statements that the students were asked to judge:

This course has thought me a lot.

I enjoyed the class.

I prefer using the I-See-Bytes library instead of console programming.

It was difficult to learn I-See-Bytes.

I wish we used Python for this class.

I wish we used Java for this class.

Table 1 shows the result of this survey. Total of 19 students attended the survey in 2023 and 39 students attended in 2024. Overwhelming majority of the students gave 5 or higher for the first question indicating that they benefitted from the course. Although not as strongly indicated, many of them expressed that they enjoyed the class as well. Question three created the strongest opinions with each year 9 of the students indicating that they strongly dislike using console programs for the instruction of concurrent programming. It should be noted that the instructor used a few console program examples during the semester, along with the I-See-Bytes library examples as an alternative way of teaching the students.

Results of the question 4 is surprising because despite the fact that majority of the students accept that the class is enjoyable (Q2), overwhelming majority also feel that I-See-Bytes is difficult to learn. However, the answers intensify around %50-%80. Fourteen out of nineteen answers are in that range. Perhaps, this means that the I-See-Bytes library is difficult enough to create a challenge, but not difficult enough to discourage or cause despair.

Table 1 & 2. Frequency of the marks given by students to each survey statement. In year 2023 (left) and 2024 (right).

S	1	2	3	4	5	6	7	8	9	10
S1		1	1		5	1	1	<u>7</u>		3
S2		2	3	2	1	1	3	2	3	2
S3	2	1		1			3	1	2	<u>9</u>
S4	1		1	1	4	2	5	3	1	1
S5	4	2		1	3	1	2		2	4
S6	<u>8</u>		1		4	2		2	1	1

S	1	2	3	4	5	6	7	8	9	10
S1	1	1	5		4	1	5	<u>12</u>	2	8
S2	1		3	1	3	4	4	<u>10</u>	5	8
S3	3	6	3	1	4	4	3	3	3	<u>9</u>
S4	8	2	2	5	4	2	3	7		6
S5	<u>10</u>	3	3	1	3	3	4	2	2	8
S6	<u>15</u>	5	3	1	3		3	2	2	5

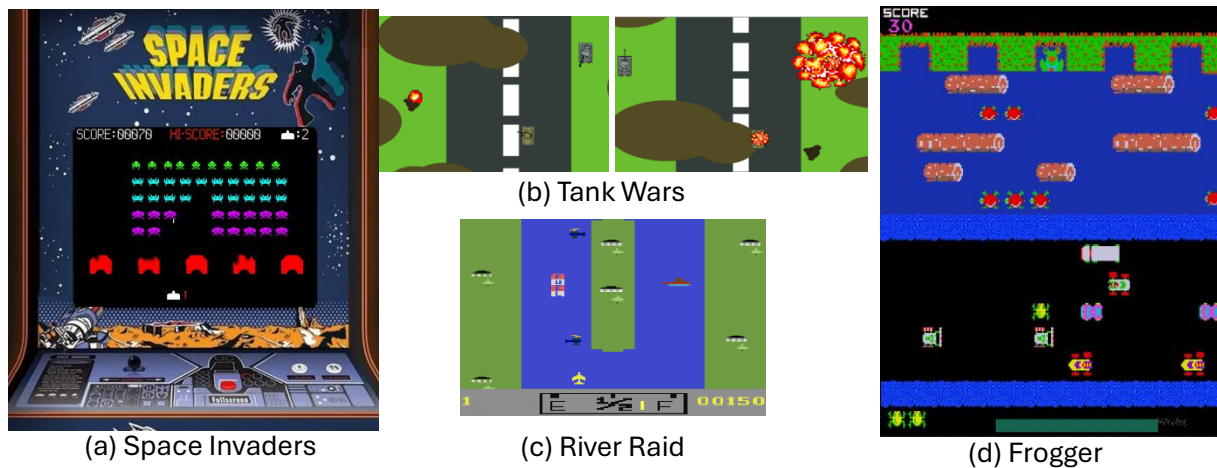


Figure 4. *Screenshots of four of the final projects submitted in 2023.*

Question six indicate that there is an overwhelming dislike towards Java. On the other hand, Q5 indicate that the number of lovers and haters of Python are almost symmetrically equal.

5. Conclusion

I-See-Bytes is a new library that uses novel C++ language standards to achieve ease of use and safety comparable to that of Python. It emphasizes gamification in order to motivate students to learn. In this study, there are concrete evidences that if morphed into game programming, difficult subjects such as concurrent programming can be made enjoyable as well. We see the evidence of that both in student surveys and in their marks. The screenshots of a few of the games submitted by the students is shown in Figure 4. Despite finding the I-See-Bytes library mildly difficult to learn, students express that they had fun working with it and they definitely prefer using the I-See-Bytes instead of console programming or Java.

At this point we must take into account that when a task is too easy, humans get bored. It seems that, there has to be an adequate amount of challenge for students to enjoy the task however, the task must not be too difficult to overwhelm them. Perhaps, the I-See-Bytes library not only rewards student's efforts by visual gratification, it also has the right amount of challenge to make them enjoy it.

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Descriptive Analysis of Measurement and Evaluation Approaches in Preschool Education Programs: 2013 and 2024 Comparison

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Abstract

In this study, the Preschool Education Program, which came into force in 2013, and the Preschool Education Program prepared within the scope of the Turkish Century Education Model, which was put into practice in 2024, were analyzed comparatively in terms of measurement and evaluation dimensions. The problem of the study is to reveal how measurement and evaluation understandings differ in terms of children, teachers and programs in the education programs of two different periods. The aim of the study is to systematically examine the measurement and evaluation approaches in these two programs, to explain the process of transition to skill-based and contemporary evaluation understanding, to reveal the strengths and weaknesses, and to offer guiding suggestions to educational practitioners. The research was conducted with descriptive analysis method; the relevant sections of both programs were evaluated through content and text analysis. The findings showed that the 2013 curriculum adopted a process-based and teacher-initiative-based assessment approach that focuses more on areas of development. The 2024 curriculum, on the other hand, with its skills-based structure, treats measurement and evaluation as a multidimensional and structured system based on children's learning outcomes, teacher's professional development and the effectiveness of the program.

Keywords: *Preschool Education, Measurement and Evaluation, 2013 Education Program, 2024 Education Program*

1.Introduction

The preschool education period (0-6 years) is a critical stage in which the foundations of cognitive, emotional, social and motor skills that shape the lifelong development of the individual are laid. This view coincides with Piaget's (1952) theory of cognitive development, as according to Piaget, children lay the foundations of basic cognitive structures such as symbolic thinking, language development and egocentrism in the preoperational stage (ages 2-7), which is defined as the "preparatory period". Vygotsky's (1978) socio-cultural development theory also emphasizes that this process is shaped by social interaction; especially with the concept of "zone of proximal development (ZPD)", it explains that the child's potential development can be supported with appropriate guidance and social

environment. Erikson (1963), in his psychosocial development theory, defines this period as the "guilt versus assertiveness" stage (3-6 years) and argues that supporting the child's social initiatives is critical for self-confidence and social competence. Montessori (1967), on the other hand, calls this period the "absorbent mind" stage and argues that the child unconsciously but intensively gains information from his/her environment. According to Gardner's (1983) theory of multiple intelligences, this period is the most appropriate developmental interval for children to discover their individual potential in different areas of intelligence. Quality education programs offered during this period provide significant improvements in children's social interaction skills, emotional regulation capacities and motor skills as well as their academic achievements (Almalki et al., 2024). Preschool period contributes to the development of self-regulation, empathy, cooperation and positive behaviors by providing learning environments that strengthen children's social-emotional skills (Damayanti & Syafril, 2024). In addition, nature-based or structured motor activities implemented during this period reveal significant improvements in both cognitive functions and fine motor skills of children (Domínguez-Muñoz et al., 2021). The ability to offset social inequalities through early intervention makes preschool education even more vital, especially for children from low socioeconomic backgrounds (Schoon et al., 2021). Indeed, systematic reviews and randomized controlled trials show that preschool education causes significant improvements in cognitive functions (attention, memory, language development), emotional reactivity, social relations and motor skills (Almalki et al., 2024; Ghosh, 2024).

In the preschool education period (0-6 years), accurate and systematic implementation of measurement and evaluation processes is vital for determining the developmental needs of the child, recognizing individual differences and improving the quality of educational practices. These processes not only monitor the child's current cognitive, linguistic, social-emotional and motor development, but also provide feedback on the teaching process and enable the restructuring of learning environments (Gelebek Üstün & Uzun, 2020).

An effective assessment process enhances the teacher's ability to make pedagogical decisions, guides the selection of teaching materials and the design of individualized learning experiences (Sapsağlam, 2013). In this context, the validity and reliability levels of measurement tools directly determine the impact of assessment results on educational decisions (Gelebek Üstün & Uzun, 2020). Especially preschool teachers' knowledge, attitudes and skills towards assessment processes are among the main components that affect the success of the assessment process (Ömeroğlu et al., 2015).

Research has shown that teachers should use standards-based, systematic assessment tools that utilize multiple data sources in order to accurately assess children's development (Karagöz & Özdemir, 2023). In addition, the current curriculum and guidance documents of the Ministry of National Education (MoNE) emphasize the importance of assessment and evaluation based on holistic developmental tracking in early childhood and state that teachers should be equipped accordingly (Republic of Turkey MEB, 2024).

For these reasons, measurement and evaluation processes serve not only for developmental monitoring of children, but also for improving the quality of preschool education programs, strengthening cooperation with families and guiding educational policies. Thus, there are

opportunities to ensure equal opportunities in education, initiate early intervention processes in a timely manner, and minimize developmental risks (Karagöz & Özdemir, 2023; Republic of Turkey MEB, 2024).

The prominence of skill-based approaches in the last two education programs has necessitated the adoption of more systematic and structured methods in measurement and evaluation processes. Implemented in 2013, the Preschool Education Program is based on process-oriented evaluation approaches based on general development areas. The Turkish Century Education Model Preschool Education Program, which came into force in 2024, introduced more detailed and standardized methods for children's skill acquisition, teachers' professional development and the effectiveness of the program. This new program aims to support children's cognitive, emotional and social development by focusing on skill-based approaches in learning processes. It also provides a variety of training materials and guidance services to ensure the continuous professional development of teachers. To increase the effectiveness of the program, standardized tools and methods are used in measurement and evaluation processes. In this way, the quality and consistency of educational practices are ensured and children's development is monitored and evaluated more objectively. These developments show that measurement and evaluation processes in preschool education in Turkey are becoming more systematic and structured. Updating education programs in this way contributes to supporting children's development more effectively and improving the quality of education.

In this context, the comparison of assessment and evaluation practices between the 2013 and 2024 preschool education programs will provide important clues to ensure quality and continuity in education. The main purpose of the study is to examine the measurement and evaluation approaches for schools from two different periods with the descriptive analysis method, to reveal the strengths and weaknesses, as well as to discuss the problems encountered in practice and potential solutions. Thus, in the light of the innovations made in the evaluation processes in terms of teacher, child and program, it is aimed to develop strategic suggestions for the problems faced by educational practitioners in current practices. In this context, our study seeks answers to the following research questions in order to narrow the scope of the research and clarify the focal points:

1. Between the 2013 and 2024 Preschool Education Programs, what are the main differences in measurement and evaluation approaches?
2. In the evaluation process from the child's perspective, what kind of differences are observed in the evaluation tools and methods of the two programs?
3. In terms of teacher evaluation, what changes are in place in terms of teachers' professional development and quality of practice?
4. In terms of programmatic evaluation, what is the innovation in the evaluation criteria and feedback mechanisms for the educational process of the two programs?

2. Method

This study aims to examine the measurement and evaluation processes in the 2013 and 2024 Preschool Education Programs through a comparative and descriptive qualitative document analysis method. Qualitative research approach envisages systematic scanning, coding and interpretation of the texts in the documents through thematic analysis (Creswell, 2013; Yin, 2014). In this method, comparative analysis was conducted using both predetermined evaluation criteria and new themes derived from the documents.

Research Sample

The sample of the study consists of two official education programs published by the Turkish Ministry of National Education: 2013 Preschool Education Program (MEB, 2013) and 2024 Turkish Century Education Model Preschool Education Program (MEB, 2024). These two documents were selected as the sample because they contain detailed information about measurement and evaluation processes and reflect the changes that have occurred in practice over time.

Data Collection Tools

In the study, the data collection process was conducted within the framework of the document analysis method. Relevant sections of the documents were systematically identified, and content analysis was conducted using pre-established coding templates (e.g. assessment approaches, tools used, frequency of processes, feedback mechanisms, etc.). Both inductive and reductionist approaches were adopted during the coding process, and inter-coder reliability was ensured by comparing the coding results of two independent researchers (Elo & Kyngäs, 2008).

Data Analysis

The collected data were analyzed thematically and comparatively using qualitative content analysis techniques. Firstly, the text passages related to the assessment and evaluation processes of both programs were coded within the framework of the determined themes; then the similarities and differences between the themes were examined comparatively. During the analysis process, evaluation criteria in terms of teacher, child and program were systematically discussed, and the evolutionary differences and development levels between the two programs were discussed in the light of the findings obtained.

Validity and Reliability

The methodological validity of the study was supported by the triangulation method; the accuracy and reliability of the findings were increased through the integration of document analysis, literature review and expert opinions (Singh, 2014; Newman et al., 2013). In addition, the coding results of two independent researchers were compared to ensure inter-coder reliability and the coding process was documented in detail (Elo & Kyngäs, 2008).

3. Findings

In our study, we examine how the measurement and evaluation processes are structured in the 2013 Preschool Education Program and the 2024 Turkish Century Education Model Preschool Education Program under the headings of evaluation of children, evaluation of the program, and self-evaluation of the teacher. The similarities and differences between the two programs will be systematically compared within the framework of these basic headings.

1. General Comparison

In this study, as a result of the document analysis method, significant differences in the measurement and evaluation processes between the 2013 Preschool Education Program and the 2024 Turkish Century Education Model Preschool Education Program were revealed. In the 2013 program, the evaluation process is structured under three main headings: monitoring children's development through Development Observation Forms, Development Reports, Monthly Education Plans and Activity Plans; reviewing the program by teachers; and periodic evaluation of teachers' own practices. This approach is limited to process-based and qualitative assessment techniques that focus more on the child's development. On the other hand, the measurement and evaluation process in the 2024 program is structured with the innovations brought by the skills-based education approach; objective measurement of learning outcomes and skill gains is aimed by using tools such as Skill Observation Form, Anecdotal Recording Form and Skill Acquisition Report within the scope of evaluation from the child's perspective. In addition, the effectiveness of the program is continuously measured, teachers' practices are evaluated using Teacher Reflection Forms to support their professional development, and feedback processes are systematically supported by family participation. This methodological framework reveals the evolution between the two programs, with more subjective and generic approaches in 2013 being replaced by systematic, structured and data-driven evaluation processes in 2024.

Table 1. *Overall Comparison of Programs*

Comparison Criteria	2013 Program	2024 Program
Measurement-Evaluation Approach	Development-oriented, more generic and process-based	Skill-based, structured and process-result oriented
Tools and Methods Used	Development Observation Forms, Reports, Activity Plans	Skill Observation Form, Anecdotal Record Form, Skill Acquisition Report
Program Evaluation	More generally, identifying the shortcomings of implementation processes	Systematic evaluation of the program content and achievement of learning outcomes
Teacher Evaluation	Expectation of an overall self-assessment	Systematic, form-based and continuous improvement emphasized
Family Engagement	Restricted emphasis	Strongly and neatly emphasized

2. Evaluation of Children in Programs

There are significant differences between the 2024 "Turkish Century Education Model Preschool Education Program" and the 2013 "Preschool Education Program" in terms of child assessment. In the 2013 program, the evaluation process was mostly based on the observation of the child's general developmental characteristics and focused on the process; in this context, the Development Observation Form, Development Report, Monthly Education Plan and Activity Plans and daily observations of teachers were taken as basis. In contrast, in the

2024 curriculum, the assessment and evaluation process adopted a more structured, process- and outcome-oriented assessment approach that focuses on children's skill acquisition in line with the skills-based education approach. While in the 2013 program, the assessment tools used were based on general developmental observations, in the 2024 program, the assessment process was made more objective and measurable with standardized tools such as Skill Observation Form, anecdotal records and acquisition reports. In addition, while in the 2013 program, children's developmental characteristics were addressed under general headings such as motor, social, and language, in the 2024 program, assessment areas were expanded and made more specific with interdisciplinary skills such as social-emotional learning and literacy, thus analyzing children's multidimensional development in more detail. In the 2024 program, assessment processes are periodic and regular, whereas in the 2013 program, these periods are not specified and left to the subjective follow-up of teachers. The role of teachers is also more free and subjective in the 2013 program, while in the 2024 program they are expected to make objective and consistent assessments through standardized forms, which encourages professional and systematic behavior of teachers. In terms of the use of assessment results, while in the 2013 program the results are limited to immediate classroom adjustments, in the 2024 program the results are systematically used in the planning of educational processes and supported by the active participation of families. Finally, while differentiated education practices for the individual needs of children based on assessment results are clearly defined in the 2024 program, this situation is more ambiguous in the 2013 program. In conclusion, the 2024 Preschool Education Program has a more systematic, standardized and comprehensive approach to child assessment and reflects a modern educational approach that effectively considers children's individual differences and focuses on improving the quality of education.

Table 2. *Comparative Analysis Table for Child Evaluation*

Criteria	2013 Preschool Education Program	2024 Turkish Century Education Model Preschool Education Program
Evaluation Approach	Process-oriented, general development based.	Focused on skill acquisition, more structured, process-outcome based.
Assessed Areas	General areas of development such as motor, cognitive, social-emotional, language and self-care skills.	Specific skills in areas such as Turkish, Mathematics, Science, Social Studies, Arts, Music, and interdisciplinary areas such as social-emotional learning skills and literacy skills.
Evaluation Period	Regular periods are not explicitly mentioned, emphasizing a more general process.	Continuous, systematic evaluation at regular intervals is expected.
Teacher Role	The teacher is defined as observer and reporter. It includes more subjective assessment.	Teachers are defined as observers and reporters who evaluate through systematic observations, collect data using standardized forms, and monitor skill development using objective criteria.
Use of Evaluation Results	The child's development is monitored; the use of the results is limited to classroom adjustments.	Results are systematically used to support children's skills acquisition, regularly shared with families and play an active role in wider education planning.
Family Participation and Sharing	Limited emphasis; not compulsory, more at the discretion of the teacher.	Strong emphasis; family involvement is made mandatory, sharing results with families and involving families in the education process is done systematically.
Individualization	Although individualization is	According to the evaluation results, the

and Differentiation	mentioned in general, concrete differentiated education approach and practices are not clearly support/enrichment practices for children are specified. systematically and clearly defined.

3. Programmatic Evaluation

When the 2024 and 2013 Preschool Education Programs are examined with the descriptive analysis method in terms of curriculum evaluation, significant differences emerge. While in the 2013 program, evaluation is limited to general effectiveness, adequacy of materials used and general evaluation of educational processes, in the 2024 program, evaluation covers detailed elements such as the adequacy level of skill gains, the realization of learning outcomes and the effectiveness of the relationships between program components. While the 2013 curriculum emphasizes teachers' personal evaluations and general meetings instead of clearly specified systematic tools, the 2024 curriculum provides for systematic data collection and analysis using standardized tools such as Teacher Reflection Forms and process-outcome evaluation reports. While the 2013 curriculum does not specify a concrete and systematic feedback mechanism for the use of assessment results, in the 2024 curriculum the results are used for continuous improvement and development of the program, and feedback processes are directly reflected in the program content in a systematic and structured manner. Finally, while stakeholder participation was limited to teachers and school administrators in the 2013 program, the 2024 program encourages and supports the participation of families and other community stakeholders in evaluation processes. This shows that the 2024 program offers a much more comprehensive, detailed and systematic structure for programmatic evaluation than the 2013 program.

Table 3. *Comparative Analysis Table for Programmatic Evaluation*

Criteria	2013 Preschool Education Program	2024 Turkish Century Education Model Preschool Education Program
Evaluation Approach	General process-oriented; it is based on the identification of defects in the implementation process.	Systematic, skill-based and goal-oriented; it is aimed to evaluate the impact of the program on skill acquisition.
Content of the Assessment	Overall effectiveness of the program, implementation processes and adequacy of materials.	The level of adequacy of skill outcomes, the realization of learning outcomes, the effectiveness of the relationships between skill areas and the integrated structure are evaluated.
Evaluation Methods and Tools	Teachers' personal evaluations and meetings; forms and recording systems are not clear enough.	Systematic and standardized forms, teacher reflection tools, process and outcome assessment reports.
Evaluation Process	The process is generally defined, but there is no clear and clear periodic structure.	There are clearly defined periodic assessment processes; continuous and regular implementation is envisaged.
The Role and Responsibility of the Teacher	The role of the teacher in curriculum evaluation processes is generally stated and is mostly at the level of subjective observation.	Teachers take an active and objective role in program evaluation processes; their professional development is supported through teacher reflection and evaluation reports.
Use of Results and	There are general and superficial	Assessment results are transformed into a

Feedback	statements on the use of evaluation results; concrete feedback processes are not defined.	concrete and continuous feedback mechanism for program development and improvement; the results are aimed to be directly used in educational processes.
Stakeholder Engagement	Limited to internal stakeholders such as teachers and administrators; wider stakeholder participation is not clear.	The active participation of teachers as well as family and community stakeholders is encouraged, and results are shared and evaluated with a wide range of stakeholders.

4. Teacher Evaluation

In the 2013 program, teacher evaluation is planned as a general and flexible self-evaluation. Teachers were expected to review their learning environment and classroom management, but there was no structured system. In contrast, teacher evaluation in the 2024 curriculum is systematic and structured, focusing on the teacher's professional practice and professional development. In the 2013 curriculum, teacher evaluation was limited to classroom management, general educational approach and organization of environments, and these evaluations were general and superficial. The 2024 program, on the other hand, includes more comprehensive and detailed elements such as the teacher's effectiveness in the educational process, his/her compliance with the skills-based education approach, and his/her impact on the achievement of learning outcomes. On the other hand, the 2024 program uses standardized tools such as "Teacher Reflection Forms" to systematically monitor teachers' professional development, and these tools provide the opportunity to continuously and objectively evaluate the teacher's development process. While the aim of the 2013 program is for teachers to gain a general awareness of their practices and make improvements when necessary, the 2024 program aims to design the evaluation results in a way that directly contributes to the teacher's professional development. In the 2013 program, it is not clear how the results of the evaluation will be transferred to the teacher's professional development and a general direction is given, whereas in the 2024 program, the results are systematically linked to the teacher's professional development plan and supported by continuous and structured feedback mechanisms. Moreover, in the 2013 program, stakeholder involvement was not defined and the evaluation process was largely left to teachers' self-evaluation. In the 2024 program, on the other hand, the participation of school administrators, other teachers and parents is systematically included in the teacher evaluation process, thus making the evaluation process multidimensional and participatory. As a result, the 2024 Preschool Education Program has made teacher evaluation processes much more systematic, structured and professionalized than in 2013. This system supports the realization of a skill-oriented and quality education by enabling teachers to continuously evaluate their practices, and effective and sustainable feedback mechanisms have been created that directly contribute to the professional development of teachers. These developments can be considered as an important step towards improving the quality of education.

Table 4. *Comparative Analysis Table for Teacher Evaluation*

Criteria	2013 Preschool Education Program	2024 Turkish Century Education Model Preschool Education Program
Evaluation Approach	A general self-assessment approach has been adopted.	A systematic, structured, professional development-oriented approach to teacher evaluation is adopted.
Scope and Content of the Assessment	The teacher's general practice focuses on classroom management and the organization of educational environments.	The teacher's professional practices, compliance with the skills-based education approach, learning outcomes and effectiveness in skill acquisition processes are evaluated.
Evaluation Methods and Tools	Specific tools and systematic assessment methods are not specified; rather, they are limited to subjective assessments.	Standardized, structured "Teacher Reflection Forms", evaluation reports and regular professional feedback tools are used.
Purpose of Evaluation	It is aimed for the teacher to review his/her own practices and make improvements.	Supporting teachers' professional development, ensuring more effective implementation of the program, strengthening teachers' practices for skill acquisition.
Use of Results and Professional Development	It is not clear how to link the results to a concrete professional development plan.	Assessment results are linked to the teacher's professional development plan and a systematic feedback mechanism is in place to support continuous improvement.
Stakeholder Engagement	Stakeholder involvement is not clearly defined, but rather left to the teacher's own assessment.	The participation of school administrators, other teachers and parents in the evaluation process is encouraged and systematically supported.

4. Discussion and Conclusion

In this study, the assessment and evaluation processes between the 2013 Preschool Education Program and the 2024 Turkish Century Education Model Preschool Education Program were examined through descriptive analysis on the basis of child, teacher and program dimensions, and the practices of both periods were systematically compared. The findings of the study revealed that evaluation approaches have undergone a structural transformation and that there are significant differences especially in the tools used, the timing of the evaluation process, how the data obtained are used through feedback mechanisms and the level of stakeholder participation in evaluation processes.

While the 2013 Curriculum emphasized teacher-initiated, process-oriented, qualitative assessment methods, the 2024 Turkish Century Education Model includes structured and standardized tools that allow for more objective and comparable monitoring of children's skill acquisition (Republic of Turkey MEB, 2024). This transformation reflects not only a change in pedagogical orientation, but also efforts to further integrate national education policies into monitoring, evaluation and quality assurance systems (Direk & Batmaz, 2024).

Recent studies show that teachers frequently use techniques such as observation-based forms, anecdotal records, and checklists in preschool assessment practices in Turkey; however, feedback loops remain weak (Gelebek Üstün & Uzun, 2020). At the international level, Puinean et al. (2022) emphasized that assessment processes should be systematically

addressed not only in terms of technical aspects but also in terms of cultural adaptation, community engagement and teacher capacity building. Jung et al. (2024), on the other hand, emphasized that teachers are burdened with pedagogical concerns in program-based evaluation practices and the importance of integrating more teacher-family-child interactions into evaluation processes.

In this context, the findings of the study reveal that the assessment and evaluation culture in Turkey has evolved from quality to quantity, which has both advantages (standardization, traceability) and limitations (loss of flexibility, teacher autonomy). This not only reflects national curriculum differences, but also coincides with the trends of transformation in assessment approaches highlighted in the international literature (Urban et al., 2022).

In terms of child assessment, the 2013 Preschool Education Program adopts an observational assessment approach based on developmental domains, process-oriented and qualitative data collection. In this model, teachers monitor children's developmental progress through individual observations, anecdotal records, and assessments in the natural environment; the evaluation process is largely dependent on the teacher's pedagogical intuition (Gelebek Üstün & Uzun, 2020).

In contrast, the 2024 Turkish Century Education Model Preschool Education Program offers an assessment system structured around a skills-based education approach. In this program, children's learning outcomes are monitored through standardized and measurable data collection tools such as Skill Observation Forms, acquisition reports and anecdotal records (Republic of Turkey MEB, 2024). This enables children's cognitive, social-emotional and motor skills to be analyzed in detail with an interdisciplinary approach and makes it possible to document learning processes objectively (Direk & Batmaz, 2024).

The structured and periodic assessment approach not only systematizes the data collection process, but also encourages the active and conscious involvement of families in the process. Jung, Seo, and Kim (2024) emphasize that such holistic assessment practices allow for more effective monitoring of children's individual differences and planning of early intervention strategies. Similarly, Pramesty Koenarso (2023) found that report cards and systematic recording techniques strengthen communication between teachers and families in documenting child development.

International literature also supports this approach. Urban et al. (2022) state that child-focused assessment processes, especially in Scandinavian countries, are based on systems that prioritize child welfare along with standardization, blended with pedagogical sensitivity. In this context, the structured and skills-based assessment model introduced by the 2024 program in Turkey represents not only a pedagogical but also a governance paradigm shift.

From the teacher perspective, the role of teachers in the 2013 Preschool Education Program is more flexible, process-based and open to self-evaluation. In this program, teachers were encouraged to conduct evaluation processes based on personal experience and pedagogical intuition; systematic and structured feedback mechanisms were included to a limited extent (Direk & Batmaz, 2024).

In contrast, the 2024 Turkish Century Education Model Preschool Education Program provides more structured and objective assessment tools to support teachers' professional development and improve the quality of their practice. In this context, "Teacher Reflection Forms", "Process-Outcome Evaluation Reports" and individual professional development plans enable teachers to periodically analyze their pedagogical practices and develop professional awareness (Republic of Turkey MEB, 2024). These practices contribute to improving the quality of practice by enhancing teachers' self-reflection skills and to the placement of teaching processes in a holistic evaluation framework.

This approach is not only a reform specific to Turkey; it is in line with international trends towards restructuring teacher evaluation and development processes. For example, Gragg and Collet (2021) state that collaborative professional development models (e.g. Lesson Study) are effective for improving the quality of teachers' practice and that these processes include components such as teacher self-reflection, peer support and practice monitoring. Similarly, Hooper, Potts, and Walton (2022) found that structured observation, feedback loops, and opportunities for self-evaluation in beginning teachers' professional development experiences had strong effects on teacher self-efficacy.

Sheridan and Wen (2021) reported the positive effects of professional development programs for early childhood teachers conducted through digital platforms on teachers' subject matter knowledge, confidence, and quality of practice, and emphasized that evaluation forms and personal development monitoring systems are critical for sustainable development. Teacher self-assessment and professional performance analysis play a decisive role in early childhood teachers' pedagogical identity development. Various studies have shown that such practices strengthen teachers' perceptions of professional competence and identity construction (Durand et al., 2016).

As a result, in the 2024 program, teacher evaluation is positioned as a process that strengthens both individual development and the quality of institutional practice, supporting the continuity of professional learning through teacher-directed and data-driven feedback systems (Fadila & Saputri, 2024).

In terms of programmatic evaluation, the 2013 Preschool Education Program focused on more general and superficial evaluation criteria; children's developmental progress was monitored based on teacher observations and classroom processes (Direk & Batmaz, 2024). Although the evaluation system of this program allowed practitioners freedom with its unstructured and flexible structure, it limited the systematic collection and analysis of data on the effectiveness of the program.

On the other hand, the 2024 Turkish Century Education Model Preschool Education Program aims to evaluate the effectiveness of the relationships between program components, achievement levels, and the accessibility of learning outcomes in detail by addressing the evaluation processes in a more analytical and holistic framework (Republic of Turkey MEB, 2024). The program evaluation process is not only result-oriented but also process-oriented, and this structure enables the implementation of continuous improvement cycles (Yune et al., 2020).

Regular monitoring of program components and systematic reflection of evaluation results on educational practices represent a strategic approach to ensure the sustainability of quality assurance in education (Garcia & Cerado, 2020). In this framework, the inclusion of teachers, administrators and policy makers in collaborative evaluation processes supports the strengthening of data-based decision-making mechanisms and the development of programs through continuous revision (Espinosa et al., 2022). This approach is also supported in the international literature; for example, Welch (2020) defines program evaluation as a fundamental tool for data-driven decision-making and pedagogical revision according to set goals.

In this context, the 2024 program aims to create a culture of high-quality, sustainable and holistic assessment in early childhood education by ensuring not only the quality of implementation but also the functioning of systemic feedback mechanisms (Roberts & Bregazzi, 2023).

In conclusion, the 2024 Turkish Century Education Model Preschool Education Program offers a much more comprehensive, detailed and systematic structure in measurement and evaluation processes compared to 2013. This structure makes it possible to monitor children's individual development with more objective and interdisciplinary criteria, to continuously support teachers' professional development, and to continuously improve the program. In addition, the inclusion of families and other stakeholders in the evaluation processes ensures that educational practices are carried out with a more holistic and participatory approach. These findings provide a solid basis for the development of strategic recommendations to improve the quality of education.

In light of the findings of this study, the following recommendations are made for educational practitioners. First of all, the systematic structure of the assessment and evaluation processes of the 2024 program, integrated feedback mechanisms for teachers' professional development and the use of standardized tools set an example for improving the quality of education. Therefore, it is recommended that the more general and subjective assessment approaches in the 2013 program be aligned with the methods in the 2024 program and that more focus be placed on teachers' professional development processes.

In addition, in order to monitor children's individual differences more effectively, it is important to expand and systematically implement skill-based and interdisciplinary assessment tools and to increase family participation. In this context, informative seminars and practical workshops for families should be organized to support children's development at home.

Regularly reviewing and updating the "Teacher Reflection Forms" and similar tools used in teacher evaluations and integrating them into professional development plans will enable the development of strategies to improve the quality of teachers' practice. In addition, strengthening collaboration mechanisms with school administrators and other stakeholders will ensure that evaluation results are reflected in the education process and a culture of continuous improvement is established.

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Effective English Teaching Methods: Integrating Scaffolding for Student Success

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Abstract

This article explores the integration of scaffolding strategies in English as a Foreign Language (EFL) classroom to support student success. The study discusses how tools like Pear Deck and classroom activities such as “Ambiguous Picture” can be used to facilitate scaffolding. It emphasizes the importance of learner profiles, personalized support, and visual aids in engaging students and promoting autonomy. The paper illustrates how scaffolding through IT tools and differentiated instruction can increase students’ motivation, confidence, and independence in language learning. The approach is grounded in constructivism and Communicative Language Teaching (CLT), supported by classroom observations and reflective teaching practices.

Keywords: *scaffolding, learner profiles, Pear Deck, EFL teaching, student engagement*

1. Introduction

Scaffolding in English language teaching involves breaking down complex learning tasks into manageable steps with the goal of gradually increasing student independence. This paper aims to demonstrate how scaffolding methods can enhance student engagement and success in EFL contexts. The study highlights how specific classroom tools and methods, including interactive technologies and games, can create an inclusive learning environment tailored to diverse student needs.

2. Literature Review

Research supports the role of scaffolding in promoting learner autonomy, particularly in second language acquisition. Vygotsky’s Zone of Proximal Development underlines the significance of support structures in learning. Various methods like CLT and visual scaffolding have been explored by scholars such as Penny Ur, Jenni Guse, and Graham Hall. The use of learner-centered tools and multimedia resources has been emphasized to cater to different learning styles and levels of proficiency.

3. Methodology

This study is based on reflective practice and classroom implementation in a secondary school in Uzbekistan. The participants were 15 eighth-grade students aged 14–15. Their English proficiency ranged from beginner to pre-intermediate. The researcher used observational data, learner profiles, surveys, and teaching activities, including Pear Deck and picture-based vocabulary tasks. The approach focused on customizing lessons using learners' interests, levels, and motivation.

4. Findings and Discussion

Findings show that scaffolding using visual aids, interactive tools, and learner profiling significantly enhances engagement and comprehension. The “Ambiguous Picture” activity encouraged prediction and collaboration. Pear Deck supported step-by-step guided practice, independent learning, and immediate feedback. Differentiation through sentence starters and audio responses helped accommodate mixed abilities. Students demonstrated increased vocabulary use, confidence, and motivation when scaffolding techniques were applied.

5. Conclusion

Scaffolding strategies are essential for EFL student success. Through tailored instruction, learner profiling, and IT integration like Pear Deck, teachers can foster autonomy and confidence in learners. While technology use may pose challenges, such as limited access to devices, creative solutions like smartphone integration can address these barriers. Future studies may explore more empirical data collection and long-term effects of scaffolding tools in diverse classroom settings.

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Authentic Self or Best Self? Navigating Teacher Identity in Language Classrooms

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Abstract

Teacher identity is the dynamic combination of beliefs, attitudes, pedagogical perspectives, and professional philosophies shaped through formal training and teaching experience. In the EFL context, the classroom often becomes a stage, with the teacher performing multiple roles, such as instructor, facilitator, controller, and mentor, while also serving as the only live model of the target language. Although acting is an essential part of teaching, this performative aspect can risk alienating the teacher from their authentic self, especially when constantly presenting a "best self" that conflicts with inner values, emotions, or beliefs. This tension creates a critical dilemma: Should language teachers prioritize authenticity or performance in their professional identities? When teachers feel compelled to adopt personas that conflict with their true selves, they may experience emotional exhaustion, identity dissonance, or even burnout. However, cultivating awareness of one's authentic self in teaching—by aligning what we say with what we do—can be a pathway to professional well-being and pedagogical integrity. This study explores how EFL teachers navigate this authenticity-performance dilemma in their professional identities and what strategies they adopt to integrate authenticity into their daily classroom practices. To achieve this goal, 15 EFL teachers were involved in the study with views on teacher authenticity and performance and the responses were analysed qualitatively. The results show that teachers do not view authenticity and performance as opposites; rather they see authenticity as being true to their values and identity, and performance as a means of engagement. They also employ several strategies to express authenticity including verbal and behavioural expressions and sharing personal experiences.

Keywords: *Teacher authenticity, Language teacher identity, EFL teaching and learning*

1. Introduction

Teacher identity comprises beliefs, attitudes, pedagogical perspectives and philosophies. It is a dynamic and evolving concept which also involves navigating conflicting roles (Beauchamp & Thomas, 2009). A teacher's professional identity is central to the teaching profession. It helps teachers shape how they see themselves, how they act, and how they understand their role in society. This identity isn't fixed or forced—it's shaped over time through experiences and reflection (Sachs, 2016). Thus, one concept that relates to identity is authenticity (McCullough, 2022) which addresses the alignment of personal beliefs and teaching practices through fostering genuine connections with students.

As language teachers and lecturers, we can cultivate strong and supportive relationships with our students by creating an environment where they feel motivated to engage with the target language, grow personally, and achieve their goals. One effective way to build these

relationships is by being authentic—showing our true selves in the classroom. (Fidler & Ramos, 2023) . Or as questioned by Jacobs et al. (2022) “do language teachers appear to students and to the teachers themselves to be “practicing what they preach,” i.e., living according to the values and behaviors that teachers encourage their students to live by? (p. 70). However, this is not always easy, as it takes time and effort to become an integral part of teacher identity. McCullough (2022) points out that being real with your students helps build trust. When you share your own experiences, you offer a new perspective and show students it's okay to be themselves. This creates a classroom where everyone feels safe to share who they are and what they've been through. Five traits describe teacher authenticity for students: approachability, passion, attentiveness, capability, and knowledge (De Bruyckere & Kirschner, 2016; Johnson & LaBelle, 2017). The authenticity of the teacher has a power to build strong relationships and inauthenticity of the teacher, on the other hand may pull a set between the teacher and the students since it may make the teacher look unapproachable, dispassionate and inattentive. Keller et al. (2018) underline that inauthenticity in emotion, where a person displays feelings that do not reflect their true emotional state, is known as ‘surface acting’ in the emotional labor literature, hence teacher authenticity matters to students, and they can differentiate authentic and inauthentic behaviors. In teaching, however, referring to Goffman’s (1959) noted dilemma, authenticity and performance seem like opposites since teaching is seen as a performance to meet the expectations which may sometimes be tricky having the risk of disconnecting from true self. At this point, it is vital to get insight about teachers’ awarenesses on their authenticity and performance. Limited studies on authenticity-performance interplay in EFL there is a need for exploration of teacher strategies. This study investigates EFL teachers’ views towards authenticity and performance qualitatively and poses research questions below:

1. How do EFL teachers perceive teacher authenticity?
 - a) How do they consider ‘authenticity’ and ‘performance’ in the language classroom?
2. What strategies are used by EFL teachers to ensure authenticity in the language classroom?

2. Methodology

This study adopts a qualitative phenomenological approach to explore the lived experiences of EFL teachers as they reflect on their identity formation, authenticity, and classroom roles. Phenomenology focuses on understanding a phenomenon from the perspective of individual experience and this individualized focus lends itself to in-depth interviews and small-scale research projects (Ayton, 2023). The phenomenological design of the present study allows a deep dive into personal narratives and emotional landscapes of language teaching.

Participants

The sampling method was selected as purposeful sampling to ensure diversity in experience, institutional background, and teaching context. Participants of the study consist of fifteen EFL

teachers (both novice and experienced) working in various formal educational contexts such as private /state schools and language institutes.

Data Collection

Semi-structured interviews were employed through online questionnaires, which include questions that explore themes such as personal beliefs about teaching, experiences of role conflict, feelings of authenticity in class, and emotional labor. Four questions were asked participants targeting thematic issues, one of which is as; *Do you feel that you act differently in class compared to your natural self outside of teaching? Can you give an example?* Participants were informed about the purpose of the study and their rights. Pseudonyms for participants were used (as P1, P2, ..) to ensure confidentiality measures.

Data Analysis

Thematic analysis (Braun & Clarke, 2006) is based on coding procedure in which codes were generated manually through interview responses of participants. Themes mainly focus on authenticity vs. performance, authenticity strategies they employed in class and reflections on professional integrity and emotional well-being.

3. Findings

The initial outcome was gathered from the analysis of the responses yielded through question 1 which focused on awareness of natural self and acting in the classroom. Table 1 shows the responses and codes:

Table 1. *Participant responses to Question 1*

<i>Q1: Do you feel that you act differently in class compared to your natural self outside of teaching?</i>	
Thematic Codes	Responses of Participants
<i>Mostly natural but adapts slightly</i>	P1: Yes, because even though I m still working in a state school I teach my students extra subjects such as writing, reading and many grammatical patterns. P2: Although I usually act my natural self during the classes, there are times that I don't. An example for this may be not telling a joke when, even if it is relevant to keep the teacher-student relationship convenient. P3: Yes, I do notice some differences between how I act in class and how I am outside of teaching—but not in a way that feels inauthentic. In the classroom, I adopt a more structured and energetic version of myself. P4: Yes. I'm much more patient in the classroom compared to my real life outside the class. P11: Not really! Maybe at the beginning of the course. It depends on the students' levels and sense of humor actually.

<i>Feels/believes completely natural/ Authentic</i>	P5: No P7: While I am teaching, I am behaving naturally. P8: No P9: No I act natural P10: No, I don't think I behave differently than I normally do in class. On the contrary, I behave very naturally. P13: I never act differently in front of anybody except my boss. P15: I don't think I act or take on a totally different personality when I teach. I feel like I act as I would outside the classroom.
<i>Acts differently due to the context or age</i>	P12: I can confidently say that I have many personas when I teach. Depending on the students' age and their attitude I act wildly different.
<i>Masks emotions or behavior</i>	P6: Yes P14: Sometimes yes. I have to restrain my emotions which might be joy or anger.

Most participants indicated that they are natural in the classroom, but they adapt teaching styles slightly when necessary. The other group think they are completely natural and authentic whereas some participants say he/she act differently due to contextual factors or to mask emotions.

Next research question was to highlight the performance side of teaching to delve into the points where performance and authenticity intersects or separate in their teaching practices.

Table 2. Participant responses to Question 2

<i>Q2: Have there been moments when you felt you had to "perform" in the classroom? What was that like?</i>	
Thematic Codes	Responses of Participants
<i>Performance as a part of teacher authenticity</i>	P1: In our classes we all use performing way to make them comfortable to speak and use English especially dialogues role plays etc. P5: Yes. It was entertaining P6: Yes sometimes. It was exciting. P9: i like teaching so even the stressful times, i don't have to force myself. P12: I usually don't feel to need to perform. I am already performing someway or another in vast majority of my classes. P14: Definitely. I know that some students are not eager to learn, but still, I need to keep teaching and performing as if English has vital role in their future.
<i>Hiding feelings to stay professional</i>	P2: I did. Although I am an energetic teacher most of the time, When I realize the students lack the motivation, I act. P3: yes, For example, there were days when I was personally going through stress or feeling emotionally drained when my son was in Germany, but I still had to walk into class with energy, enthusiasm, and a smile—especially when teaching young or less motivated students. P4: Sometimes. Because I shouldn't bring my problems to the class. I need to show my max. teaching performance. P7: In my opinion sometimes we feel depressed but we must tell a lesson. Ok I forget my problem and try to perform my lesson. P9: i like teaching so even the stressful times, i don't have to force myself. P11: Yes, of course. Especially at private school, you have to act as if they are all smart. P13: Sometimes I make them think I'm angry. Though I'm never angry. It's like lying but for a good reason. P15: Sometimes I find myself insecure and anxious when the attention of the class is on me. I try to remember to act more confidently in those situations.

<i>Not clearly defined</i>	P10: There was never a moment when I acted in the class.

As shown in Table 2, two main themes emerged from participant teachers' responses; either performance is seen as a part of authenticity or a way of hiding feelings to stay professional. When performing is a part of being authentic, teachers tend to perform to focus on learners' learning. Performance to maintain teaching is considered as a part of teacher identification to save the day when their mood or situation conflicts with their identity as a teacher.

Table 3. Responses of participants to Question 3

<i>Q3: In what ways do you feel you bring your real self into the classroom? (Probe: tone of voice, stories, beliefs, emotions, teaching style? (Markers of Teacher Authenticity)</i>	
Thematic Codes	Responses of Participants
<i>Emotional expressions/openness</i>	P2: I sometimes fake emotions, trying to appear more serious to keep the order in classroom. I usually show how I care for my responsible students and how I don't care about irresponsible students. P3: I'm also open with my emotions—I let students see my excitement, curiosity, even frustration sometimes, in a constructive way. I think that honesty builds trust and makes the classroom feel more human and less mechanical. P5: <u>Sometimes my mood effects</u> P9: Emotions
<i>Tone of voice/body language</i>	P2: My tone of voice, my stories are always my real self. P3: My tone of voice is probably the most obvious—it's warm, encouraging, and expressive, just like in my personal life. P5: Sometimes changing my voice P6: Tone of voice P12: A sudden shift in my tone or my body language becoming stiffer etc.
<i>Personal stories/experiences</i>	P2: My tone of voice, my stories are always my real self. P3: I often share personal stories or real-life examples to make lessons more relatable, especially when I want students to connect emotionally with a topic or to see English as a living language, not just a subject. P13: I always give them ways to connect. They need to know that we are not NPCs in their terms. So I tell stories and give real life examples. P14: Experiences. When a topic matches with my past, I share my experiences. P15: I share stories and personal experiences from time to time.
<i>Humor</i>	P10: In class, it's like I meet with my friends. I make a lot of jokes during class. I tease my students. P15: I like to make jokes; I also make jokes in the classroom sometimes
<i>All of them/General teaching styles</i>	P1: Once one of my teachers told me that from elementary school till the university, we meet many teachers so during this period we had to learn every aspect of good way of teaching method from them. Some told us many stories some of their teaching style and I m the summary of my all-teachers talent. P7: All of them P10: All the ways

Table 3 presents participants responses of Question 3 that seeks strategies used by participant teachers in the classroom to maintain authentic. Five themes emerged as authenticity strategies applied by the teachers. Emotional expressions and openness are seen as a tool to be authentic whereas another group use personal experiences which also present sincerity and

empathy. Some participants tend to use their voice or body language and others rely on general teaching styles that capture all strategies.

4. Discussion and Conclusion

Authenticity is a contextual and multifaceted notion of teacher identity. In the study, as response to research question 1, many teachers (e.g., P1, P2, P3, P4, P11) view themselves as generally authentic, but acknowledge that certain adjustments in tone, behavior, or energy are necessary to maintain classroom effectiveness. These adaptations are not seen as inauthentic but as practical expressions of their teaching role; "I act a more structured and energetic version of myself." (P3)"I act naturally but sometimes hold back jokes to maintain order." (P2). Some teachers see no divide between their real and teaching selves; participants like P5, P7–P10, P13, P15 claim they do not change their behavior in class, reflecting a stable, unified sense of identity. For them, being authentic means acting the same inside and outside the classroom, and this congruence fosters student trust."I don't think I behave differently than I normally do." (P10)"I don't act differently in front of anyone except my boss." (P13).

According to results of research question 1 (b) that explores the authenticity and performance, participant teachers think that performance can be a natural part of authentic teaching and it is not always artificial or in conflict with authenticity. For some, it is part of their communicative method—especially when using humor, role-play, or storytelling to engage learners (e.g., P1, P5, P6, P9, P12, P14). "In our classes we all use performing ways to make them comfortable." (P1)"Even during stressful times, I don't have to force myself." (P9). These teachers view performance as an authentic extension of their personality and pedagogy. Other teachers perform to meet professional expectations or mask emotions. Several teachers (e.g., P2, P3, P4, P7, P11, P13, P15) describe performance as emotionally laborious—a tool to hide personal struggles, stress, or demotivation. In these cases, performance is a necessary compromise to maintain classroom presence and fulfill institutional roles, "I had to walk into class with energy, even when emotionally drained." (P3)"I try to act more confidently when I feel anxious." (P15). This reflects a more tension-filled view of performance, where teachers mask their authentic emotions to maintain professionalism. All in all, there is a dynamic spectrum; EFL teachers do not see authenticity and performance as opposites. Instead, they understand: Authenticity as being true to their values and identity, performance as a means of engagement, but also at times a form of emotional labor, and the classroom as a space where adaptation, emotional regulation, and sincerity intersect. Teacher identity as a combination of both.

Teachers employ several intentional strategies to express authenticity in their teaching. Verbal and behavioral expression; using natural tone of voice, personal humor, and emotional expressiveness, openness showing passion for teaching through energy, gestures, and voice modulation. Sharing personal experiences and integrating personal stories, real-life examples, and honest anecdotes that connect language to life. Being genuinely responsive to students while knowing when to withhold personal distress and practicing emotional regulation to avoid burnout or inappropriate disclosure. Some teachers adopt multiple classroom "personas" as needed, without compromising authenticity (e.g., "strict big brother" or "playful

storyteller”). Reflecting on what version of the self best supports the learners’ language developments, without acting false.

Our findings reveal that, according to EFL teachers, true authenticity is not about rejecting performance altogether but about ensuring that even the roles we play reflect our deeper values, beliefs, and intentions. The challenge is not whether to wear a mask in the classroom, but whether what’s beneath it aligns with what we bring to our teaching. The results are consistent with similar research (Labelle et al. 2022) especially demonstrating authenticity through openness and perform to maintain professionalism. In addition, teachers mostly display approachability indicator of authenticity (McCullough , 2022) that includes using personal stories and telling jokes.

The study has limitations that are peculiar to the qualitative nature of the research which restricts generalizability such as number of participants. Future studies Next attempts may regard student views on their teachers’ authenticity or development of a teacher authenticity scale for EFL contexts.

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Uncovering Digital Generations' Perceived Ease of Use, Perceived Usefulness, Satisfaction, and Acceptance Intention of the MOODLE Platform in Algeria

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Abstract

The COVID-19 pandemic played a considerable role in advancing distance education in Algeria, increasing the use of online educational resources. The most commonly used platform in Algeria is MOODLE, an open-source learning management system that facilitates student-teacher interaction through a variety of advanced academic features. However, Algerian students across different universities **prefer familiar methods**, including **emails** and **Google Classroom**. Thus, this study investigates the perceived ease of use, perceived usefulness, satisfaction, and acceptance intention of MOODLE in Algerian universities, accentuating intergenerational disparities. To this end, drawing on the item scale developed by Han and Sa (2022), an online survey is posted on Facebook pages of different Algerian universities. Survey findings reveal that the sample consists of Generation Y¹ and Generation Z² whose attitudes differ considerably. The majority of Gen Y find MOODLE easy to use, yet they do not plan to use it because it is ineffective and does not appeal to their satisfaction. Gen Z, on the other hand, probe MOODLE to be practical and easy to use, but they are dissatisfied, denoting no acceptance intention. Accordingly, increasing students' knowledge and awareness of MOODLE is imperative, and it is highly recommended to improve the platform's implementation in Algerian universities.

Keywords: *Acceptance Intention, Algeria, LMS, MOODLE, Perceived Ease of Use, Perceived Usefulness, Satisfaction*

1. Introduction

During the COVID-19, Algeria—like many countries worldwide—adopted online learning in all educational levels, and higher education is no exception. Thus, as a response to quarantine measures, MOODLE was implemented to ensure teaching and learning continuity. However, both teachers and students from different generations—Generation Y (Gen Y) and Generation

¹ Born between 1981 and 1996 (aged 29 to 44)

² Born between 1997 and 2012 (aged 13 to 28)

Z (Gen Z)—showed reluctance toward its use, and it has remained limited even after the pandemic. Ghounane (2020) and Mezaour and Chadli (2021) attribute this to the fact that students are generally demonstrating a disfavour toward educational platforms, even when offering similar features to social media platforms. Accordingly, this study investigates Algerian university students' perceptions and attitudes toward the MOODLE platform, by analysing four dimensions: Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Satisfaction (SAT), and Acceptance Intention (AI), besides exploring the generational differences between Gen Y and Gen Z. This study seeks to answer the following questions: (a) how do Algerian university students perceive the ease of use of and the usefulness of MOODLE? (b) To what extent are they satisfied and intend to accept the MOODLE platform? And (c) how do these technology acceptance attitudes differ among Gen Y and Gen Z?

2. Literature Review

The term generations has been defined variably by different scholars, Strauss and Howe (1991), for instance, defined the term generations as a group of individuals born within the same time frame, and who share similar characteristics, including cultural, technological, and societal backgrounds, which in turn shape their attitudes, behaviours, and expectations. Gen Y and Gen Z are among these cohorts, wherein Gen Y are individuals born between 1981 and 1996, while Gen Z are those born between 1997 and 2012. Gen Y, though technologically adept, demonstrate less mastery and fluency toward using digital tools than Gen Z who are digital natives possessing innate technological proficiency (Dimock, 2019).

In Algeria, generational differences in technology use remain inconsistent and understudied, particularly that students' attitudes differ across digital generations (Gen Y and Gen Z). Indeed, these disparities should be emphasised before teaching through online platforms, MOODLE being a case in point, so that each generation's expectations and needs can be adequately met.

The generational differences can be assessed by analysing users' acceptance of technology using the Technology Acceptance Model (TAM), developed by Davis (1989), which offers a valuable theoretical framework. This model suggests that users' decision to utilise new technologies are influenced by two core components: Perceived Ease of Use (PEOU), which refers to the person's belief on how a system is easy to use, and Perceived Usefulness (PU), referring to how much a person believes that the system will help them in their work (Davis, 1989). Later, TAM was expanded into TAM2, which incorporates other variables, such as organisational support and technology training that influence users' acceptance of technology (Venkatesh, 2000). This model was extended further to TAM3 which presents a full set of factors that explain users' adoption and use of technology (Venkatesh & Bala, 2008). Although TAM2 and TAM3 offer valuable understanding of how users come to accept and use technology by integrating external and cognitive variables, the present study sticks to the original TAM framework, as its core constructs —PEOU and PU— are more relevant. These constructs help explain users' Satisfaction (SAT), which then leads to their Acceptance Intention (AI).

3. Research Methodology Design

Research Philosophy and Purpose

To ensure coherence and methodological clarity, this study begins by outlining its research philosophy and purpose, as the present study uses clear methods and relies on critical reflections, with the goal of improving some gaps. The post-positivist paradigm, therefore, is the most relevant philosophy to approach the present study, and as it requires successive studies, this research is the first step in a series of studies about the topic under investigation. To this end, this study aims to explore the sample's acceptance of MOODLE as an educational platform with a special focus on generational differences.

Sampling

As far as the sampling technique is concerned, this study uses a multi-stage sampling method to select participants. We first used a purposive sampling technique to intentionally select Algerian university students, who then willingly agreed to participate in the study. The participants' age ranges between 18 and 22.

Data Collection and Analysis

Data of the present study are collected through an online survey posted on different university Facebook pages and Google Classroom as the official platforms on which all educational and administrative updates are posted. The survey follows Han and Sam's (2022) TAM, which investigates the constructs PEOU, PU, SAT, and AI. The model has been adapted to fit the context of MOODLE, the official online educational platform endorsed by Algerian higher education. Furthermore, one item in the model related to cost is removed as MOODLE is a free platform in Algeria.

The obtained data are analysed through mixed-method analysis, allowing us to better understand the generational differences in terms of attitudes toward the use of MOODLE. Using quantitative and qualitative methods helps to accentuate both objective measurements and subjective perspectives. Quantitative data are translated into percentages, further explored qualitatively to highlight the reasons behind frequencies of responses, represented in participants' possible motivations, contextual factors, and cognitive perspectives.

4. Key Findings

Perceived ease of Use (PEOU)

MOODLE ease of use is perceived differently by each generation. The majority of Gen Y find MOODLE intuitive, easy to use, and efficient in academic contexts. However, Gen Z acknowledge MOODLE accessibility yet with ineffective use. The very few neutral responses reported by Gen Y and Gen Z may represent their varied experiences with MOODLE, engagement limitations, or uncertainty about the platform. Accordingly, usability

concerns among Gen Z highlight the necessity to initiate training and to adjust instructional approaches. Therefore, Gen Z's engagement would be increased after improving the platform's accessibility.

Perceived Usefulness (PU)

There are generational disparities between Gen Y's and Gen Z's PU of MOODLE. Indeed, MOODLE's support for learning and information acquisition is appreciated by Gen Y who declare its benefits in enhancing academic performance and facilitating accessibility to content. However, Gen Z's recognition of MOODLE's potential is underrepresented by their skepticism about MOODLE's ability to boost learning outcomes. Neutrality in some of Gen Y and Gen Z students' responses may imply uncertainty about the value that MOODLE can add to learning, having mixed experiences with MOODLE's functionalities, or sameness to other digital platforms. Overall, PU is reflected positively in MOODLE's structured resources for Gen Y and negatively in its irrelevance to Gen Z's academic needs. Therefore, it is becoming essential to align MOODLE's functionalities with these cohorts' expectations and to enhance its features for effective education.

Satisfaction (SAT)

There are differences in experience, choice, and perceived platform quality, reflecting students' satisfaction levels with using MOODLE. Both generation cohorts are generally satisfied with MOODLE use owing to its engagement, usefulness, and structure aligned with their needs. However, a considerable proportion of the sample reported neutral and dissatisfied views about the quality of MOODLE. Such stances may indicate the sample's frustration with the role of MOODLE in supporting their learning because it may be deficient in elements that keep them connected and engaged in meaningful interactions. Students who are dissatisfied perceive MOODLE as an ineffective platform that does not meet their learning expectations and preferences. Therefore, MOODLE's usability, relevance to students' needs, and engagement functionalities are deemed deficient and require critical refinements.

Acceptance Intention (AI)

Intentions to accept MOODLE for future use and recommendation vary between both generational cohorts. Gen Y show agreement to neutrality, but most Gen Z hold negative stances. Most Gen Y reported willingness to engage with, choose, and endorse MOODLE in future use, implying their openness to support MOODLE as a learning platform. Neutrality in accepting to use MOODLE may evince hesitation and uncertainty about future long-term commitment because the platform may not be motivating or lacking distinguishable features compared to other learning platforms. Gen Z's low AI may denote disinterest in any future engagement, which may imply MOODLE's irrelevance and students' preferences of traditional learning or maybe other learning platforms. Thus, engagement barriers, MOODLE's value, and institutional support are key factors necessitating attention and improvement to encourage future adoption.

5. Conclusions

This exploratory study uncovers generational disparities in Algerian Gen Y's and Gen Z's PEOU, PU, SAT, and AI toward MOODLE as a learning platform. Gen Y's and Gen Z's opinions on MOODLE vary, showing considerable convergences and divergences in the study constructs (PEOU, PU, SAT, and AI). Both Gen Y and Gen Z perceive MOODLE to be useful and easy to use, yet they are both dissatisfied with its effectiveness in the learning process. However, Gen Y and Gen Z diverge at the level of AI: Gen Y intend to use MOODLE though ineffective for them, but Gen Z do not find it appealing to use though practical.

This study informs Gen Y cohorts' idiosyncrasies because in the educational context, most studies consider them "young lecturer," while this research deals with Gen Y as university students in the Algerian context. It is commonly known that Gen Y lecturers strive to bridge policy decisions with institutional demands, the platform and students' needs. However, Gen Y students aspire to use a platform that ensures their interactive, synchronous, educational engagement. Even MOODLE's synchronous mode fails to meet such expectations and preferences, which is consistent with studies conducted by Mallinson (2009) and Postolovet et al. (2017).

Despite divergences in generational attitudes, Gen Y students are much like Gen Z in probing learning as an experience that adapts to students' preferences and whose content is personalised according to their needs. Such expectations are applicable to learning through MOODLE, which it does not provide. These findings are compatible with study findings by Sarikaya et al. (2024) and Tick (2018).

In the Algerian context, university students –without specifying generational cohorts- prefer social media to MOODLE (Ghounane, 2020). Although Algerian university students can access MOODLE, they face difficulties of use that engender negative attitudes (Benadla & Hadji, 2021; Ghounane & Rabahi, 2023), which in turn implies no intention for future use.

6. Recommendations

Based on the study conclusions, some recommendations are suggested for better MOODLE adoption:

- MOODLE has interactive functionalities, so accustoming students about them may increase their engagement.
- Teachers should be trained on delivering multimedia-rich, engaging lessons.
- MOODLE student ambassadors may play a significant role in boosting its use in Algerian universities.
- Visual attraction that appeals to students' interactive preferences, especially Gen Z who tend to depend on visuals, should be integrated on MOODLE.

- Institutions should organise regular workshops on MOODLE functionalities.
- Multimodal guides and support should be available and accessible by teachers and students.
- Enhancing MOODLE as a mobile-responsive application can be helpful in getting students engaged.
- Artificial intelligence should be part of the learning experience on MOODLE to provide individualised content to both teachers and students.

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A Tri-Stacked LSTM for Fake News Detection

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Abstract

The spread of misinformation online has been a serious problem. In this paper, we propose a Tri-Stacked LSTM based approach for detecting fake news that achieves higher accuracy and robustness. Method recasting Establishing frequent events and non-frequent events using the set of sharing-users. The model uses stacked LSTM layers to successfully learn linguistic, contextual from news article content. We present the AUTHORL-Fake dataset, an extensively curated set of labeled fake and real news articles, aimed at complete benchmark evaluation. TF-IDF vectorization, tokenization, and data splitting were applied for pre-processing the dataset to obtain the best feature extraction. We conducted experiments with 10-fold cross-validation, which showed that the Tri-Stacked LSTM model surpassed previous models. The highest performance was 93.45% accuracy and had a macro-average precision, recall, and F1-score of 93%. By contrast, notionally, other models like RNN (75%), LSTM (90%), Stacked LSTM (91.37%) scored poorly. These evidences show that the impressive performance of the Tri-Stacked LSTM model could be extended to help detect fake news with high precision (i.e., reducing the possibility of false negative), an obviously crucial need in a practical misinformation detection system. Highly importantly, this work provides a scalable approach to fake news detection with valuable implications for scholars, social media sites, and policymakers, who are devoted to fight against misinformation.

Keywords: *Fake NEWS Detection, Deep Learning, Tri-Stacked Long Short-Term Memory, Term Frequency-Inverse Document Frequency Vectorization, Machine Learning*

1. Introduction

Fake news spread on the internet has evolved into a socially relevant problem, that impacts public opinion, democratic processes, and confidence among members of the society (Su et al., 2024). False news, fabricated to delude readers, is spreading faster than ever with the help of the most popular social media platforms, online news websites, blogging, and instant messaging platforms (Bhatt et al., 2022). Disinformation misshapes the public conversation, but it also discredits sources of information, undermining trust in print or digital media (Jiang et al., 2020). And so it's really important that we get good at spotting fake news, in order to keep our information from being ruined and our health endangered.

Recent advances in the applicability of machine learning (ML) and deep learning (DL) indicates promise in this direction, but traditional models continue to struggle to successfully

address these issues as the spread of information itself is a function of the complexity and the evolving strategy of misinformation (Qi et al., 2021; Roy et al., 2018). For example, the Fake Stack model introduced by (Keya et al., 2023), integrates BERT embeddings and CNN and LSTM for better detection accuracy. Similarly, (Singhania et al., 2017) proposed the 3HAN which employed a hierarchical attention network mechanism to model high-level messages in fake news. Although these methods look promising, their performance can be further enhanced, particularly to respond to the dynamic nature of misinformation.

In this paper, we introduce a new model variant, the Tri-Stacked LSTM model, for better fake news detection, that extends, (Sabeeh, 2020) the model idea in the form of stacked LSTM layers to better capture complex linguistic, context-movement as well as temporal patterns presented in news articles. The research in this application has been designed towards trying to address the following general research questions: To what extent could deep learning contribute to a more precise detection of fake news? Compared to several pretrain models, such as RNN, the three-stacked-lstm model appears to be performing well in terms of accuracy, precision, recall and F-measure? By the addition of this new model, in the field of fake news detection, this work adds to the increasing size of existing studies, and it offers a more scalable and efficient solution to the problem of misinformation at a world-spanning scale (*AI Frameworks for Fake News Detection*, 2025; Zhou & Zafarani, 2021).

2. Literature Review

Misinformation and disinformation in digital media is one of the significant challenges to the public trust and narrative integrity in society (Firdaus et al., 2024; Sutradhar et al., 2023). The spread of misinformation, particularly in social media, makes traditional detection methods inapplicable to rich, dynamic features of online fake news given that such detection methods are often based on handcrafted features (Wang, 2020; Xue et al., 2021). As a result, deep learning techniques (Goyal et al., 2025), in particular Long Short-Term Memory (LSTM) network, have been extensively investigated for solving speech-related tasks. LSTM Network, one of three typical RNNs is powerful which can capture dependency relationship across time in sequence data, so it can be a possible method to perform fact-checking of textual statements (Ajao et al., 2018; Roy et al., 2018).

LSTM models should learn the temporal and language patterns of the fake news. These models are good at learning broader context of the words in the text, which is key for spotting subtle cues of deception like sensationalism, unverified information and emotional appeal (Jaybhave et al., 2023; Qi et al., 2021). Although they are engineered for sequential data, traditional LSTM models have attained high accuracy when diagnosing fake news with syntactic and semantic linguistic features found in mis or disinformation.

To make LSTM models perform even better, recent research attempts to stack more LSTM layers, resulting in the Tri-Stacked LSTM models. We believe that the proposed architecture enables better representation and reflects the hierarchical structures of the relationships in text, which benefits the distinguishing of real and fake news with the learned complex patterns in the input data by model (Devlin et al., n.d.; Vaswani et al., 2023). The model with stacked LSTM layers can extract low-level patterns; and high-level contextual information, and can achieve a high detection accuracy.

The use of these AI-based models in educational scenarios is immensely crucial. Rapid misinformation spread is such that school and university education systems should integrate advanced detection technologies to facilitate digital literacy. Through automating fake news discovery, we allow educators to provide students with the tools and skills to search and discriminate between reliable and unreliable content, critical thinking abilities and media literacy. This is necessary for enabling them to counteract the problems of misinformation in the digital age (*AI Frameworks for Fake News Detection*, 2025; “News Literacy Project,” 2025).

3. Methodology

In this paper, we employ a methodical approach for developing and analyzing a Tri-Stacked LSTM network on the problem of fake news detection (Soni et al., 2024). The method is composed of data and preprocessing, model building, training, evaluation and performance metrics to end up with a robust and reliable detection system.

3.1 Data Collection and Features

We experiment on the AUTHORL-Fake dataset (a dataset of 72,134 news articles labeled as real or fake). The data was gathered from various authentic sources, to maintain a symmetry amongst the classes and avoid any bias (Dagur et al., 2025). The features of the dataset include:

- **ID:** A unique identifier of each article.
- **Title:** The headline of the news article.
- **Text:** The text of the entire news article, important for natural language processing.
- **Label:** A binary label (fake or real) of the article.

The balance of the dataset, consisting of 51.5% fake news and 48.5% real news, ensures that both classes are able to be trained freely without orientation toward a specific one, which reduces the risk of overfitting and attains generalization.

3.1.1 Data Preprocessing

Quality and completeness of data preprocessing is responsible for enhancing the model performance:

- **Stop Words Removal:** Trivial or less meaningful words like is, the, and, etc., were excluded using NLTK in order to reduce noise.
- **Tokenization:** The text was tokenized in form of words in order to vectorize and analyse it.
- **TF-IDF Vectorization:** Term Frequency-Inverse Document Frequency (TF-IDF) was used to vectorise the text data, which shows the important words that define the distinction between regular news and fake news.

3.1.2 Model Construction and Training

The Tri-Stacked LSTM architecture is 3-layered LSTM model, which aims to capture not only short but also long-range dependency in the text. It is this hierarchical representation learning that (Sabeeh, 2020), enables this model to achieve the improved capacity of the fake news detection. The model was established by 10-fold cross-validation to be robust and less biased. It was analyzed using accuracy, precision, recall and F1-score.

3.1.3 Evaluation Metrics

To evaluate the performance of Tri-Stacked LSTM model, we developed the evaluation metrics from the CM. The metrics used include:

- **Accuracy:** The proportion of news which are correctly classified among all of them in the dataset.

$$\textbf{Accuracy} = \frac{\text{TN} + \text{TP}}{\text{TP} + \text{FP} + \text{TN} + \text{FN}}$$

- **Precision:** The number of fake news articles identified by the model that are fake divided by all articles predicted as fake.

$$\textbf{Precision} = \frac{\text{TP}}{\text{FP} + \text{TP}}$$

- **Recall:** The proportion of true fake news articles that the model has been able to correctly identify.

$$\textbf{Recall} = \frac{\text{TP}}{\text{FP} + \text{TP}}$$

- **F1-Score:** The harmonic average of precision and recall that warns to the balance between precision and recall.

$$\textbf{F1 - Score} = \frac{\text{Precision} * \text{Recal}}{\text{Precision} + \text{Recal}}$$

From the confusion matrix, we make predictions where these are classified into 4 possible outcomes: True Positives (TP), False Positives (FP), False Negatives (FN) and True Negatives (TN). These magnitudes enable us to see where the model behaves well and does not.

3.2 Proposed Approach: Tri-Stacked LSTM Model

The model developed in this work is the Tristacked-LSTM model for the challenging problem of fake news detection (Ozbay & Alatas, 2020). The scaffolding of the model is as follows:

- **Input Layer:** The text data is converted into tokenized vectors and then TF/IDF.
- **Tri Stacked LSTM Layers:** The model consists of 3 stacked LSTM layers which helps in capturing short term and long term dependencies in the text. Here, the multi-

layered nature facilitates enhanced learning of contextual and linguistic features from the text and contributes to highly successful fake/real news detection.

- **Densely Connected Layer:** This is after the LSTM layers and the output will be given as the (hidden) input to a fully connected layer which will combine all features learnt by the LSTM layers.
- **Output Layer:** The ultimate classification is performed with a binary output layer using a sigmoid activation function, where whether an article is fake (1) or real (0) is indicated.

Training, Loss and Optimization Tri-Stacked LSTM model is trained with binary cross-entropy loss and optimized with Adam optimizer. Performance results of the model are obtained through accuracy, precision, recall, F1-score and summary of the performance.

Tri Stacked LSTM Model for Fake News Detection: Process Flow

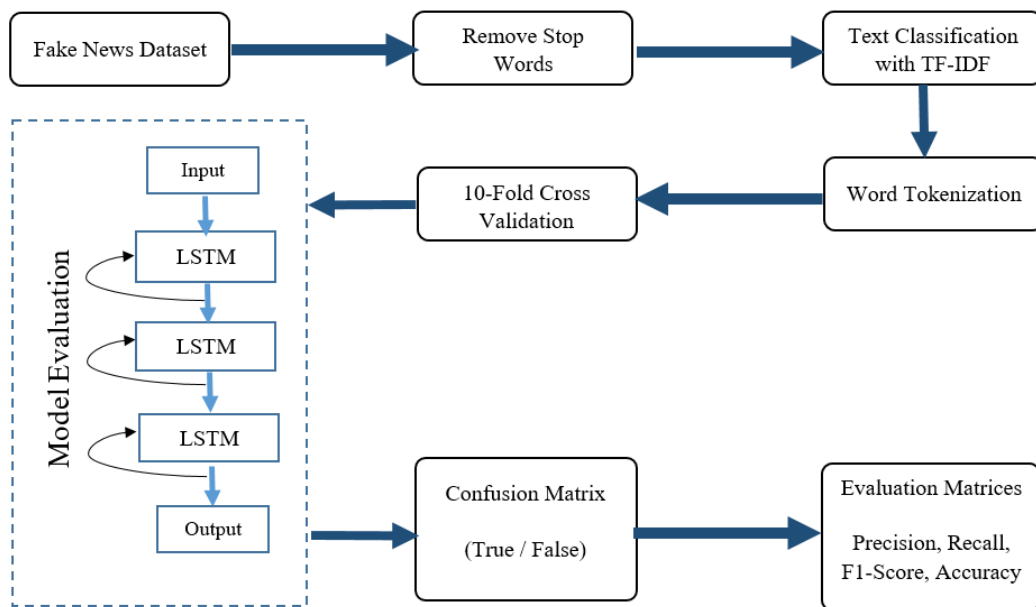


Figure 1: Tri-Stacked LSTM Model for Fake News Detection Process Flow

The flowchart shows the methodology to detect fake news with the aid of Tri-Stacked LSTM. Obviously the final one can be any other vectorization routine) Starting from data acquisition then data preprocessing (e.g., stop word removal, tokenization, TF-IDF vectorization... parties plays can be done simultaneously with the gathering of the data also. The data are split with 10-Fold cross validation and fed into the Tri-Stacked LSTM model. finally model is evaluated using accuracy, precision, recall and f1-score using confusion matrix.

3.2.1 Fold Wise Classification Report

Fold	Precision (Class 0)	Recall (Class 0)	F1-Score (Class 0)	Precision (Class 1)	Recall (Class 1)	F1-Score (Class 1)	Accuracy
1	0.91	0.89	0.9	0.89	0.91	0.9	0.9
2	0.89	0.87	0.88	0.88	0.89	0.88	0.88
3	0.92	0.91	0.91	0.9	0.92	0.91	0.91
4	0.88	0.86	0.87	0.87	0.88	0.87	0.87
5	0.9	0.88	0.89	0.88	0.9	0.89	0.89
6	0.87	0.85	0.86	0.85	0.87	0.86	0.86
7	0.93	0.92	0.92	0.91	0.93	0.92	0.92
8	0.89	0.87	0.88	0.87	0.89	0.88	0.88
9	0.91	0.89	0.9	0.89	0.91	0.9	0.9
10	0.9	0.88	0.89	0.88	0.9	0.89	0.89

3.3 Mathematical Expression of Deep Learning Algorithms:

3.3.1 Simple LSTM

Forget Gate

$$f_t = \sigma(W_f \cdot [h_{t-1}, x_t] + b_f)$$

- f_t is the forget gate output
- W_f is the weight matrix for the forget gate.
- h_{t-1} is the previous hidden state.
- x_t is the input at time t .
- b_f is the bias term for the forget gate.

Input Gate:

$$i_t = \sigma(W_i \cdot [h_{t-1}, x_t] + b_i)$$

- i_t is the input gate output.
- W_i is the weight matrix for the input gate.
- b_i is the bias term for the input gate.

Candidate Memory Cell:

$$\{\widetilde{C}\}_t = \tanh(W_c \cdot [h_{t-1}, x_t] + b_c)$$

Where:

- $\{\widetilde{C}\}_t$ is the candidate memory cell
- W_c is the weight matrix for the memory cell
- b_c is the bias term for the memory cell

Update the Cell State:

$$C_t = f_t \cdot C_{\{t-1\}} + i_t \cdot \{\widetilde{C}\}_t$$

Where:

- C_t is the cell state at time t
- $C_{\{t-1\}}$ is the previous cell state.

Output Gate:

$$o_t = \sigma(W_o \cdot [h_{\{t-1\}}, x_t] + b_o)$$

Where:

- O_t is the output gate.
- W_o is the weight matrix for the output gate.
- b_o is the bias term for the output gate.

Final Hidden State:

$$h_t = o_t \cdot \tanh(C_t)$$

Where:

- h_t is the hidden state output at time t .

3.3.2 Tri Stacked LSTM Model Mathematical Expression:

Tri-Stacked LSTM has three LSTM layers stacked together. This can be expressed in terms of equations as:

First LSTM Layer:

$$h_t^{\{(1)\}} = \{LSTM\}_1([h_{\{t-1\}}^{\{(1)\}}, x_t], W^{\{(1)\}}, b^{\{(1)\}})$$

Where:

- $h_t^{\{(1)\}}$ is the output of the first LSTM layer at time t .
- $W^{\{(1)\}}$ and $b^{\{(1)\}}$ are the weight and biases for the first LSTM layer.
- X_t is the input at time t .

Second LSTM Layer:

$$h_t^{\{(2)\}} = \{LSTM\}_2([h_{t-1}^{\{(2)\}}, h_t^{\{(1)\}}], w^{\{(2)\}}, b^{\{(2)\}})$$

Where:

- $h_t^{\{(2)\}}$ is the output of the second layer at time t .
- $h_t^{\{(1)\}}$ is the output from the first LSTM layer.

Third LSTM Layer:

$$h_t^{\{(3)\}} = \{LSTM\}_3([h_{t-1}^{\{(3)\}}, h_t^{\{(2)\}}], w^{\{(3)\}}, b^{\{(3)\}})$$

Where:

- $h_t^{\{(3)\}}$ is the output of the third LSTM layer at time t .
- $h_t^{\{(2)\}}$ is the output from the second LSTM layer.

Final Prediction Layer:

$$y_t = \sigma(W^{\{(d)\}} \cdot h_t^{\{(3)\}} + b^{\{(d)\}})$$

Where

- y_t is the output at time t which predicts whether the news is fake (0) or real (1).
- $W^{\{(d)\}}$ and $b^{\{(d)\}}$ are the weights and biases for the dense layer.
- σ is the sigmoid activation function for binary classification.

4. Result and Discussion

4.2.1 Artificial Neural Network for Fake News Detection

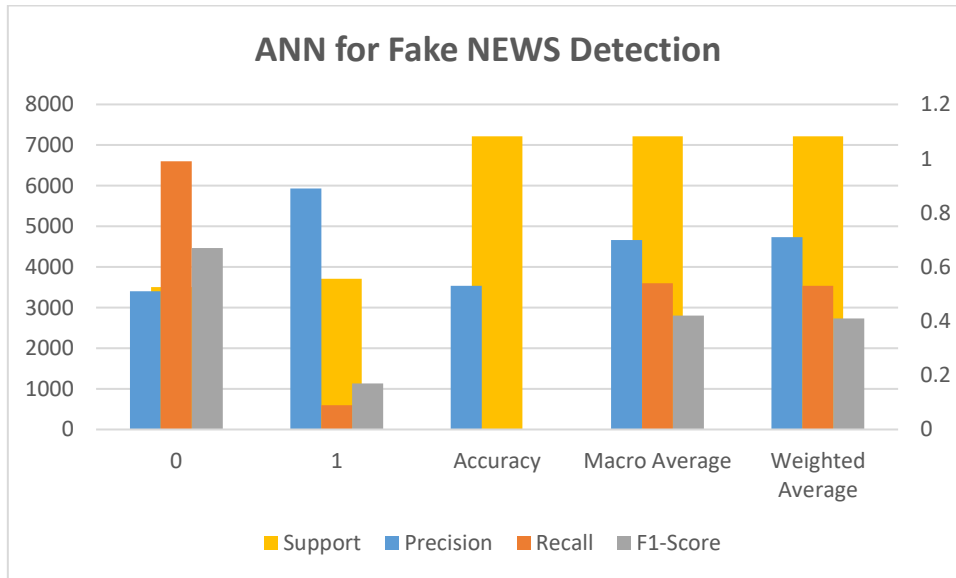


Figure 2: Artificial Neural Network for Fake NEWS Detection

The ANN model that we have implemented (Search for Find Fake News Detector), has achieved moderate performance, yielding an overall accuracy of 53%. The model's performance at detecting true news (class 0) is very well, but recall is high (0.99) while

precision (0.51) and F1-score (0.67) are low. In the case of fake news (class 1) precision is high (0.89) while recall is very low (0.09), which gives a low F1-score of 0.17. The macro average statistics indicate a relatively balanced performance but being weak at low location of 0.70 precision, 0.54 of recall, and 0.42 of F1 score. The weighted average indicates a little better accuracy 0.71 and recall 0.53, whereas very low F1-score is found 0.41 indicating there is a need to have good performance in fake news detection.

4.2.2 Recurrent Neural Network for Fake News Detection

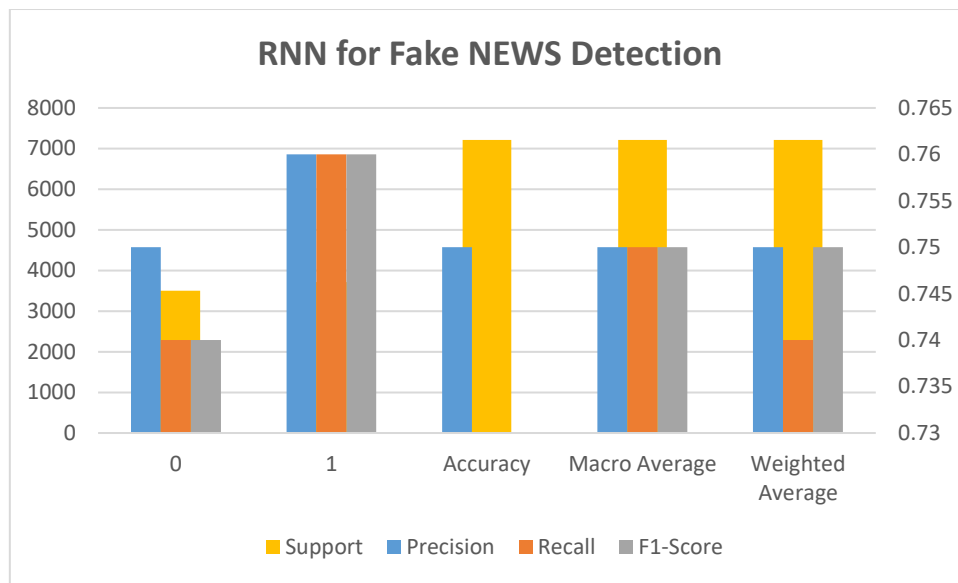


Figure 3: Fake NEWS Detection using Recurrent Neural Network

The accuracy of the RNN (Fake News Detection) model shows improved performance than ANN model with 75%. The two classes of true news and fake news have a good performance with the precision and recall score of the class 0 (precision: 0.74, recall: 0.74) and class 1 (precision: 0.75, recall: 0.77), to the F1-score of 0.74 for class 0 and 0.76 for class 1. The macro average metrics have pretty balanced values and are about 0.75 for precision, recall and f1-score. The Model also achieves weighted average average score which supporting the good performance on both of the class with 0.75 precision and recall as well as 0.75 F1-score. 20 In general, RNN model makes a good overall detection of the true and fake news.

4.2.3 Long Short Term Memory for Fake News Detection

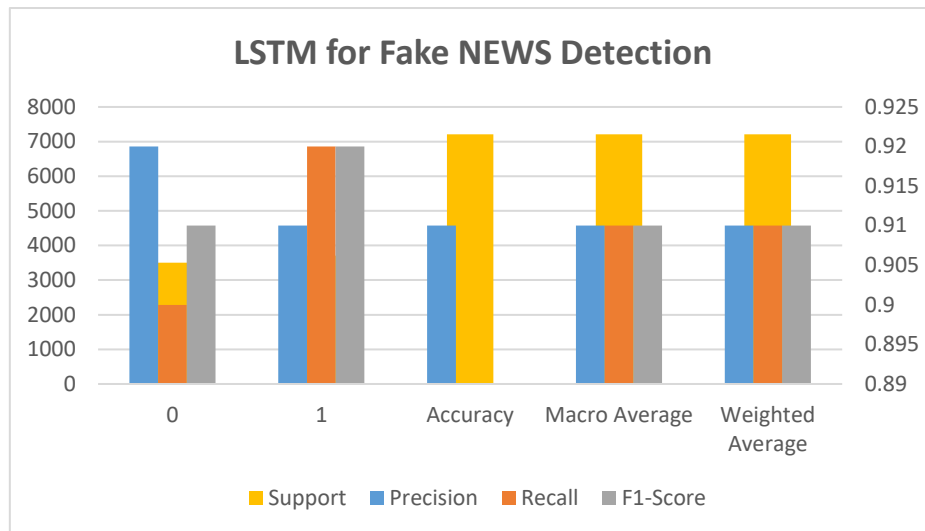


Figure 4: Fake NEWS Detection using Long Short Term Memory

The LSTM model for Fake News Detection is also performing quite well, and the total accuracy is 91%. Well, both are high indeed: Precision 0.92 for class 0, and 0.91 for class 1. It also has as a good recall with 0.90 in class 0 and 0.92 in class 1, yielding an F1-score of 0.91 in class 0 and 0.92 in class 1. The following macro average metric values also suggest that model is performing well across the two classes –Precision (≈ 91), recall (≈ 91) and F1 score (≈ 91). Weighted average results also confirm this by bringing precision recall and F1-score up to 0.91. To sum up, the LSTM model is appropriate in the true and fake news detection due to its good model performance and relatively high detection accuracy.

4.2.4 Stacked LSTM's for Fake News Detection

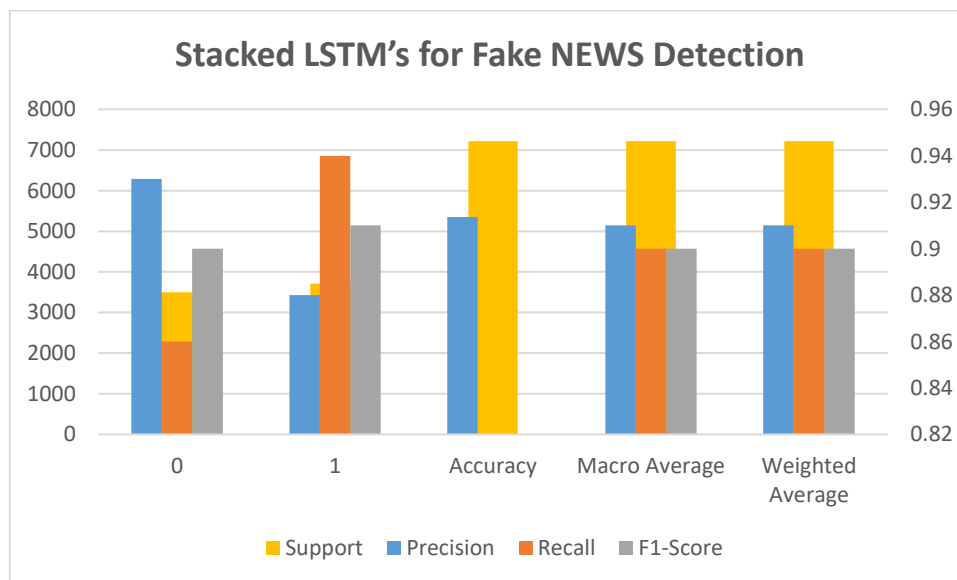


Figure 5: Fake NEWS Detection using Stacked Long Short Term Memory

The Fake News Detection Stacked LSTM model is also doing well with an accuracy of 91.37%. The model works relatively well over both the class; class 0(true) has precision: 0.93, Recall:0.86, f1-score: 0.90. The model achieves for class 1 (fake news) a precision of 0.88, a recall of 0.94 and as a result, a high F1-score equals to 0.91 by class type 2: (true news). The macro average precision, recall, F1-score is fair, 0.91, 0.90, and 0.90. The same is

seen for the weighted average, where model performance is, in general, good to all observations, since all the metrics takes the value around 0.91. It means, although the Stacked LSTM model is not the best, we can conclude that the Stacked LSTM model is able to make a balance between real news and fake news with high accuracy and reliability.

4.2.5 Tri Stacked Long Short Term Memory for Fake News Detection

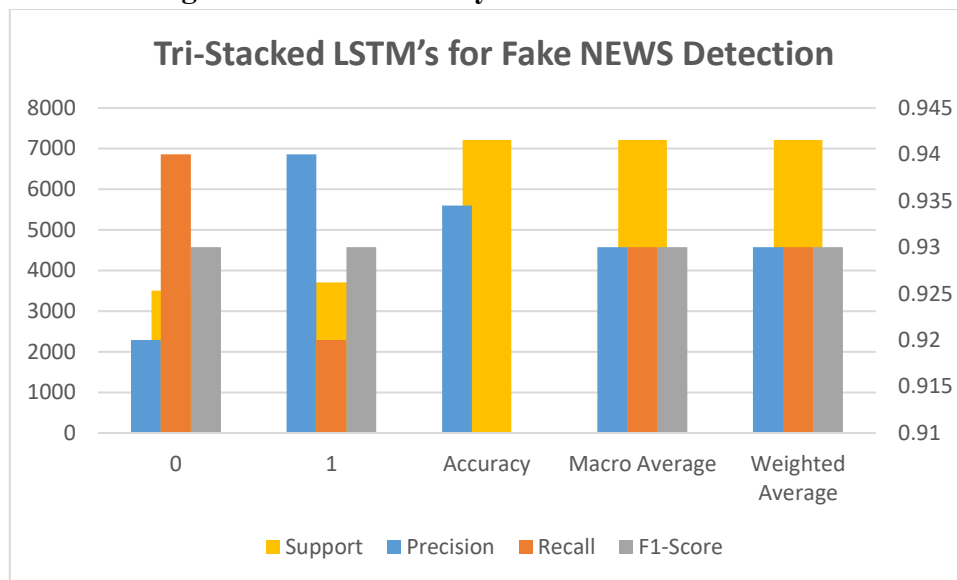


Figure 6: Fake NEWS Detection using Tri Stacked Long Short Term Memory

Tri-Stacked LSTM(Fake News Detection) model provides a quite impressive result with an accuracy of 93.45. Result Performance Both models have achieved an excellent performance with class 0 (real news) precision 0.92, recall 0.94, and F1-score 0.93. Class 1 (fake news) also gives again a lively performance in terms of the precision 0.94 and recall 0.92 with F1-score 0.93. The macro average precision, recall and F1 score of brother are 0.93 indicating balance accuracy of the model with respect to two classes. This is also reflected in the average weighted search results, with precision, recall and F1-score being at 0,93. To conclude, the Tri-Stacked LSTM model is very good in terms of true and fake news detection with a trade-off equal to the classification accuracy.

5. Conclusion

The work uses the Tri-Stacked LSTM model which performs better than RNN, LSTM and Stacked LSTM for fake news detection. The Tri-Stacked LSTM model is composed of three LSTM layers, which enable it to learn the relationship between short term, and long term

dependencies in the textual information, and as such it has enhanced ability to detect subtle patterns in fake and real news pieces. The model achieved a very good accuracy of 93.45%, as well as precision, recall, and F1-scores of around 93% confirming the strength and generalization of the model. This increase is also important for lowering number of false negatives and consequently it results in a better detection of fake news. What is more, the well adaptability to imbalanced datasets, and learning dynamic patterns of the fake news misinformation all indicate that this model is a scalable and cost-effective tool to combat the spread of fake news information, and it can have potential practical implications for teachers, politicians and social media. It contributes to the existing hodgepodge of misinformation detection research, and offers potential as a resource to combat digital misinformation challenges.

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Enhanced Melanoma Detection Using Modified CNN Architectures with Adaptive Feature Fusion and Transfer Learning

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Abstract

This study proposes an underlying feature that explores a new CNN architecture for melanoma detection with enhanced accuracy, sensitivity, and specificity. The study improves on current systems by incorporating dermatology-specific transfer learning, attention techniques, adaptive feature fusion, and ensemble modeling techniques. We employ HAM-10000 as the training and validation datasets. Image preprocessing such as black hat filtering, grayscale conversion, binary thresholding, and the inpaint Telea method aids the reduction of noise and improvement of quality. Generalization is improved through data augmentation. We used two models MobileNet V2 and a Custom CNN (MNIST-64). MobileNet adopts depthwise separable convolution to achieve lightweight feature extraction and MNIST-64 adds some convolution and pooling layers for projection purpose in classifying. MobileNet had 86.37% accuracy, MNIST-64 had 98.53%, and seems to be overfitting as shown by 100% training accuracy. VGG16 got 94.21% accuracy but better resource demanding, AlexNet achieved 89.67% acc but poor feature extraction. MNIST-64 and VGG16 will give you greater accuracy, but are of course more costly in terms of computation. This study highlights the potential of AI in melanoma diagnosis and presents directions for future work for the model in interpretability, broader validation, and clinical adoption.

Keywords: *Melanoma, Convolutional Neural Networks (CNN), Dermatology-specific Pretraining, Adaptive Feature Fusion, Medical Image Analysis*

1. Introduction

Melanoma is an aggressive form of skin cancer and its early detection is crucial for survival. Conventional diagnostic procedures, which are mainly reliant on the visual skills of dermatologists, are subjective and could not achieve consistent results. Growing prevalence of melanoma worldwide accentuates the importance for advanced diagnostics that allow reliable and valid measures within a suitable period of time (Rahman et al., 2022).

More recently, Convolutional Neural Networks (CNNs) have been proposed as tools to automatize the skin lesion classification process. Although CNNs have demonstrated good results, detecting small features in melanoma is a challenging task, which may cause false negatives or positives. Another challenge pertains to the data, because very large labeled

datasets and considerable computational resources are needed (Qureshi et al., 2022). This paper aims at improving melanoma detection by combining the modified CNN architectures using adaptive feature fusion via transfer learning, as well as to get this empirically tested practice established (Hasan et al., 2021).

In addition, attention mechanisms are applied in this study to allow the model to learn from the most discriminative regions of skin lesions. Attention mechanisms N Attention mechanisms aid in improving the diagnostic accuracy focusing on the important areas that are required for differentiating between benign and malignant lesions (Mohanty et al., 2022). By integrating these state-of-the-art tools, the developed model is proposed to develop a more efficient and powerful instrument for early skin melanoma diagnosis, which could be possibly used in clinic.

The study is also congruent with the general aims of education to improve learning and learning results by means of new technologies. AI and deep learning models as part of the medical curriculum could offer real life diagnostic tools to students, moving beyond passive models to interactive and data driven learning and teaching in healthcare education. Such progress in AI-driven tools can help in creating better teaching practices, especially in areas such as dermatology, which is an early-saving, people-saving branch of medicine (Ashtagi et al., 2024; Rahman et al., 2022).

2. Literature Review

Melanoma detection is still challenging since accurate extraction of features and high detection accuracy are required. (Rajeswari et al., 2024) proposed a meta-heuristics based deep learning (DL) model for classifying skin melanoma from MRI images. Their model, Wolf AntLion Neural Network (WALNN), produced impressive performance in sensitivity, specificity, and accuracy as compare to standard models such as Decision Trees (DT) and SVM, which strongly indicated the advantage of hybrid optimization approach in feature selection. (Cheng et al., 2024) also investigated deep-feature-extraction-based methods for skin cancer classification, using a self-attention CNN, and constructed an effective model for accurate melanoma diagnosis.

Recent AI based approaches have shown significant improvement in identification of skin disorders. (Kushimo et al., 2023) compared different DNN for skin disorder classification, and recommended ResNet152 to be the most powerful DNN in terms of recall, accuracy, and precision. Their results highlight that deep learning models, particularly CNN-based ones, may automate and outperform human dermatological diagnosis in some scenarios. Additionally, (Halabi, 2023) investigated the effect of attention mechanisms in the field of transfer learning for skin cancer detection, achieving better melanoma classification.

In the realm of CNN models, (Sorour et al., 2023) used Inception V3, Inception ResNet V2, and MobileNet to predict skin disease and got better classification accuracy by integration of multiple CNNs in image classification task. This is based on transfer learning and highlights the generalization and robustness ability of CNNs in medical imaging. (Ali et al., 2021) also improved CNN-based melanoma classification with pretrained models incorporated with data augmentation techniques and showed that doing so can improve results in low data scenario.

Further, (Gupta et al., 2024) used WALNN for melanoma diagnosis, based on hybrid feature selection. The model showed good sensitivity and specificity, indicating its potential as a useful tool for early detection of melanoma based on the ISIC dataset. Such an approach is in line with other research, for example (Reis & Turk, 2024) which combined CNN features and attention model to improve melanoma detection.

(Kumar et al., 2024) investigated KNN classifier with GLCM for melanoma categorization and found that KNN presents best performance with small dataset, indicating the applicability in a limited-resource scenario. Their method was quite accurate, especially on the ISIC dataset. Similarly, (Maniraj & Thamizhamuthu, 2025) proposed a CNN-LSTM-attention model, again confirming the effectiveness of feature fusion on classification performance.

In melanoma segmentation, (Dandu et al., 2023) used filters based on colour layout and achieved an accuracy of 90.96%. Focus This study highlighted the relevance of image enhancement methods to strengthen the performance of melanoma detection systems. Additionally, (Thwin et al., 2025) implemented a CNN-based: they used a modified attention mechanism, which utilized multi-scale feature extraction that permits to enhance the melanoma classification accuracy by adjusting the focus ability of the model.

These investigations underscore the progressive development of deep learning in the field of melanoma diagnosis. Crucial novelty, such as feature fusion, attention mechanisms and transfer learning are upgrading the efficacy of melanoma detection systems. These are the critical developments needed to translate these models into the clinic for an efficient and speedier diagnosis.

3. Methodology

This approach was employed to design a better detection system for melanoma based on modified CNNs, adaptive feature fusion, and transfer learning. Dataset, feature selection, the preprocessing steps and the major parts of the model are explained in the following sub-sections.

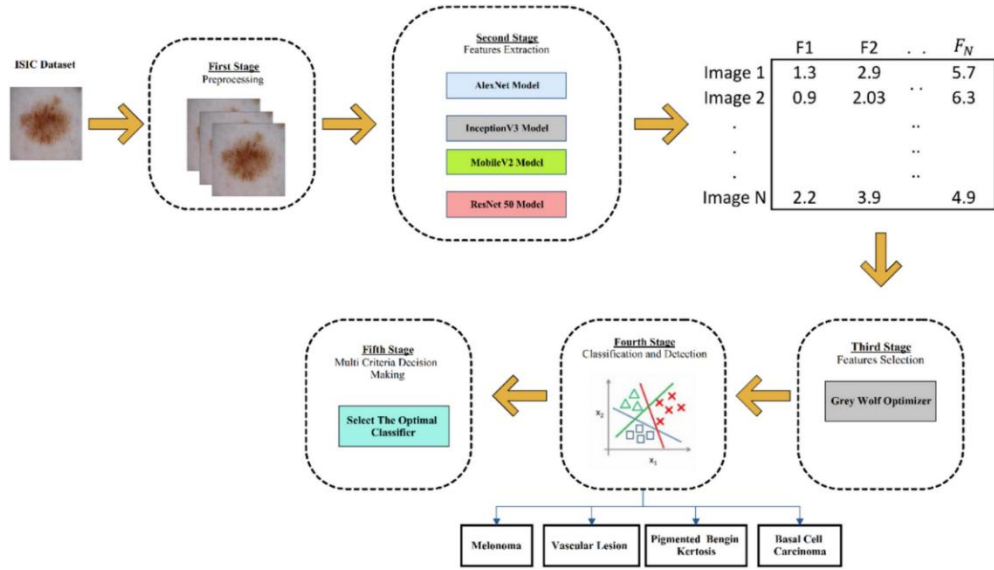


Figure 1: Overview of the ISC system for skin cancer detection

3.1 Dataset

The ISIC (International Skin Imaging Collaboration) archive, a publicly available image repository of benign and malignant skin lesions, provides the dataset for our study. The data source consists of a range of skin types, lesion size and luminations, which is conducive to training a generalizable and robust melanoma detection model. It is annotated according to lesion type, position, and patient meta information of each image, which guarantees broad coverage during the training process of the deep learning algorithm.

Table 1: Distribution of Cell Types in the HAM-10000 Dataset

Cell Type	Number of Images	Percentage (%)
Melanocytic Nevi	6705	67.0

3.2 Preprocessing

In order to guarantee the quality and comparability of data, we preprocessed the dataset as follows:

- **Rescaling:** All images are first rescaled to a fixed resolution (e.g. 224x224 pixels).
- **Normalization:** Converting pixel values to a range between 0 and 1 in order to get a good numerical stability.
- **Augmentation:** Rotating, flipping, scaling, and changing brightness of the images to increase data size and the robustness of the model.
- **Color Space Conversion:** Images can be transformed into the grayscale or HSV color space for determining the effect of color on classification.

These are to make the dataset similar, and to be sure to trained on the right data.

3.3 Feature Extraction and Fusion

The model uses adaptive feature fusion to merge the high-level and low-level features from several layers of MobileNet V2 CNN. This fusion strategy strengthens the model's power of recognizing both subtle and obvious melanoma presentations, including irregular borders and texture patterns. The features are extracted from multiple layers and then (relevance) fused, which enhances the classification.

3.4 MobileNet V2 Architecture

The base structure of our model is also designed using MobileNetV2, a lightweight and mobile-friendly CNN architecture. MobileNet V2 uses depthwise separable convolutions, which has fewer parameters but achieves satisfactory performance. Architecture The architecture is composed of several bottleneck layers with ReLU6 activation, and batch normalization for stability during training. MobileNet V2 architecture is initialized on ImageNet dataset knowledge, giving the model ability to make general feature learning before training it for melanoma detection.

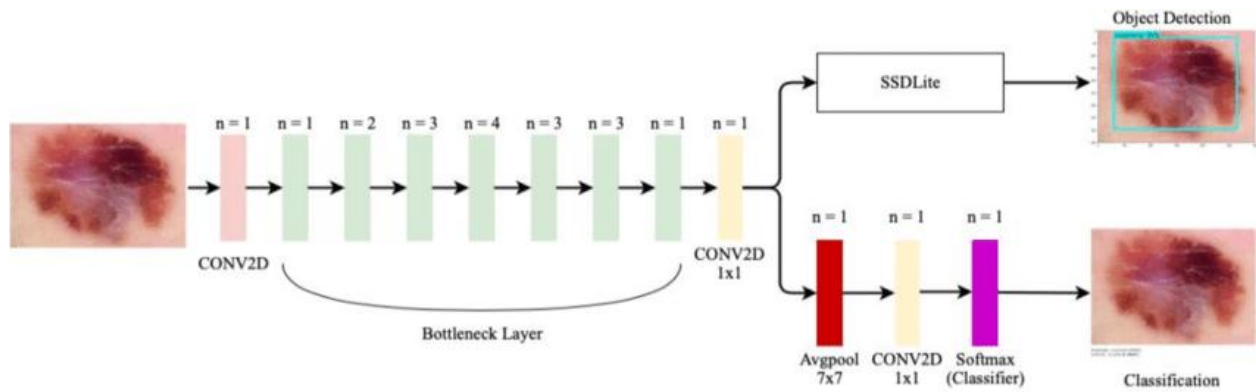


Figure 2: Architecture of the SSDLite model for skin lesion object detection and classification

3.4 Transfer Learning

Transfer learning is then used to improve the performance of the model using knowledge from pre-trained models. The MobileNet V2 trained on a large and mixed dataset such as ImageNet, is re-trained on the ISIC dataset for detection of melanoma. This significantly decreases training time, and the model tends to better generalize to unobserved melanoma images.

3.6 MNIST-64 Model for Comparison

The MNIST-64 Model is adopted as a benchmark to evaluate the performance of the proposed method. The MNIST-64 Model modifies the original MNIST data set, which is generally used for digit recognition, to be 64x64 pixels. This strategy represents a naive/baseline classifier for comparison purposes. The performance of the proposed approach in detection of melanoma is evident by comparing outcomes from this baseline model with that of MobileNet V2.

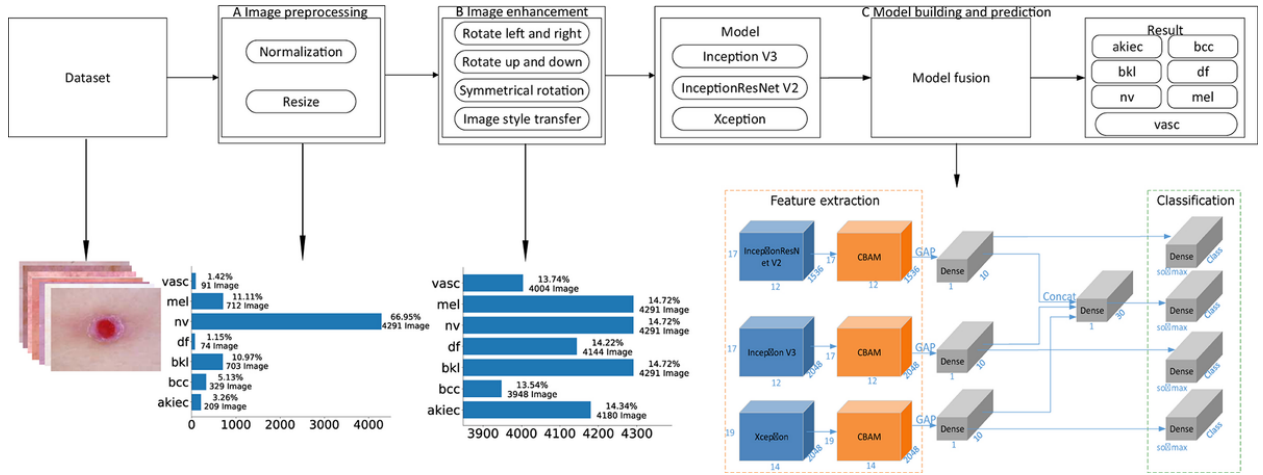


Figure 3: Pipeline for skin lesion classification using model fusion and feature extraction

3.5 Attention Mechanism

An attention mechanism is inserted into the architecture of MobileNet V2 to drive the model's attention towards the most important parts of the skin lesion images. The mechanism ensures the model focuses on significance features (e.g., irregular border of lesions and special texture) that will help the network to differentiate between benign and malignant lesions. This configuration increases the accuracy of model to predict melanoma.

3.6 Model Architecture

The architecture includes a feature extraction backbone of MobileNet V2 and a classification dense layer. The model then uses an adaptive feature fusion layer that merges features from across the CNN layers depending on relevance after the initial feature extraction. The last layer adopts softmax activation to form the multi-class model with benign and malignant as the two classes. The architecture is developed to achieve the highest sensitivity and specificity of the skin lesion detection.

3.7 Training Process

The model is trained with the cross-entropy loss function, to accommodate multi-class classification problems. We use the Adam optimizer with a learning rate of 0.0001. Each training iteration uses 32 batches and early stopping is utilized to prevent overfitting in the training phase. The model is trained for 50 epochs and the performance is checked after each epoch throughout the 10-fold cross validation. k-Fold Cross-Validation: The dataset is divided into 10 sub-datasets (folds), and the model is trained using 9 folds, while testing the model on the remaining fold with each iteration. This guarantees solid validation and enables an evaluation of the model's Generalisation over the data partitions.

3.8 Evaluation Metrics

The results are measured through well-known metrics with following the performance of the model.

- **Accuracy:** The proportion of true results (both true positive and true negative) among the total population.

- **Precision:** The number of true positives divided by the number of false positives and true positives.
- **Recall:** Proportion of true positives identified by the model.
- **F1-score:** The F1-score is a balance of recall and precision, the harmonic mean of recall and precision.
- **AUC-ROC:** Area under the receiver operating characteristic curve, reflecting the discriminating capability of the model for benign and malignant lesions.

These measures are a multi-dimensional assessment of the ability of the model to correctly classify.

3.9 Validation

The model suggested are analysed in term of stability and reliability by using k-fold cross-validation. Dataset is split into k subsets and model is trained and validated k times. This makes it so that the model performs similarly on different data splits and reduces bias by allowing the model to generalize well to unseen data, when used.

3.10 Comparison with Baseline Models

We compare the performance of the proposed model with various baseline models such as ResNet50, VGG16 and InceptionV3. Among evaluated metrics including accuracy, precision, recall and F1-score are compared. It serves as a demonstration of the efficacy of the proposed CNN architectures with feature fusion and transfer learning, in relation to the task of melanoma classification.

3.11 Proposed Approach

To solve the problem, we present a method making use of modified Convolutional Neural Networks (CNNs) with adaptive fusion transfer learning for melanoma identification. The CNN model is pretrained on the ISIC dataset (with both benign and malignant skin lesions). It is based on the following key elements:

- **Feature Fusion:** we fuse high-level and low-level features from multiple layers of the CNN which is effective to grasp both global and local patterns that are important in detecting melanoma.
- **Transfer Learning:** Pretrained models (e.g. from ImageNet) are employed to enhance generalization and reduce training efforts. These models are further fine-tuned on our melanoma dataset to transfer the learning to lesion classification problems.
- **Attention Mechanism:** A focus mechanism steers the model's attention towards the most informative area of the skin lesions, improving classification performance, especially for subtle features.

4. Results and Discussion

This chapter presents and analyzes the experimental results of the MobileNet and MNIST-64 models for melanoma detection. We begin by describing the experimental setup and data used to train and test the models. The outcomes, including loss, accuracy, and other key metrics,

are then presented. Following the results, we compare the two models, discuss their performance, and explore their potential clinical applications in skin cancer diagnosis.

4.1 Performance of MobileNet

We will examine the MobileNet model's melanoma detection performance in this part. The results will be presented in detail, and we will talk about what these findings mean. To determine how well the MobileNet architecture distinguishes between benign and malignant skin lesions, we measure its performance using a number of parameters, including loss and accuracy.

Approximately 86.37% of the time, the MobileNet model was determined to have accurate training results. An approximate value of 0.6664 was determined for the training loss, which is a measure of the error that occurs during training. An accuracy of about 83.54% was reached by the MobileNet model during validation. Correspondingly, a loss of 0.7905 was recorded on the validation dataset. The accuracy rate for the test dataset was about 86.37% according to the MobileNet model. With a value of 0.6664, the test loss sheds light on how well the model generalises.

4.1.1 MobileNet Accuracy

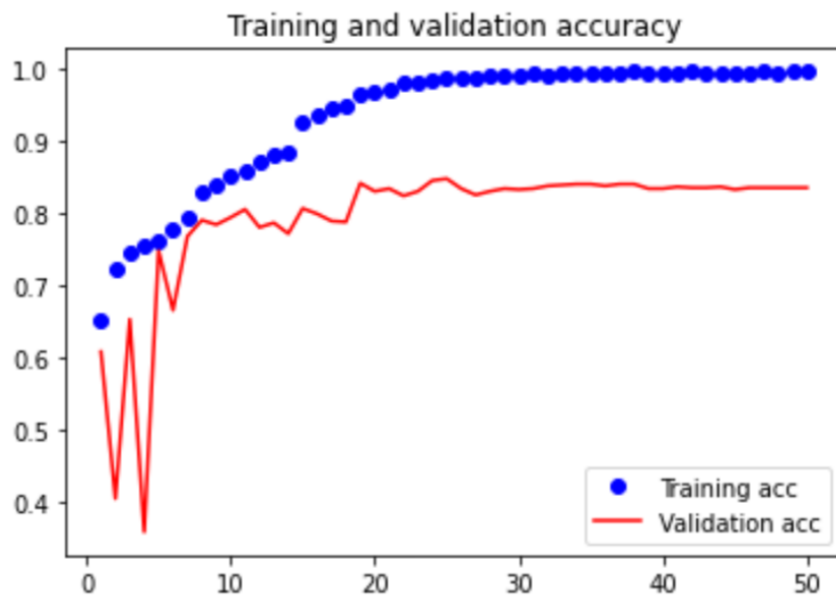


Figure 4: *Training and Validation Accuracy*

A graph comparing the model's training and validation accuracy over various epochs is shown in Figure 4. On one side, we have the number of epochs, and on the other, we have the % of correctness. The training accuracy usually increases as the model learns, and the graph usually

reflects the model's improvement over time. You can check how well the model applies to new data by looking at the validation accuracy curve. A smaller gap between training and validation accuracy indicates good generalization, whereas a large gap may suggest over fitting.

4.1.2 MobileNet Loss

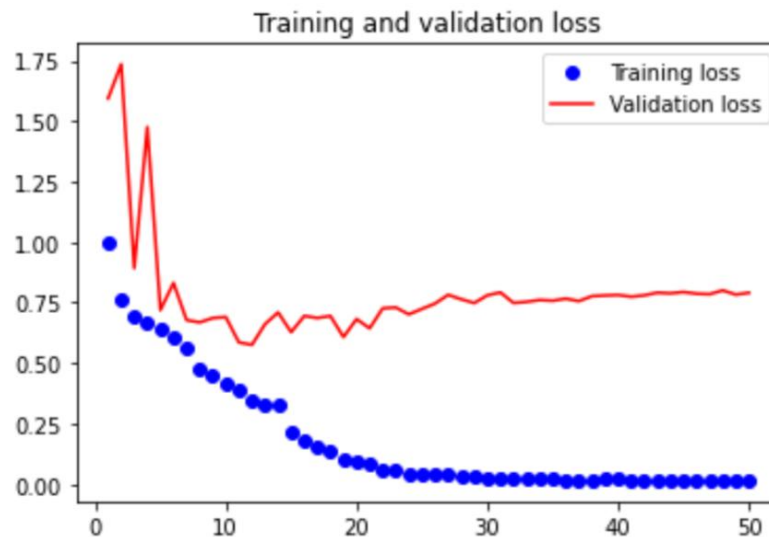


Figure 5: *Training and Validation Loss*

Multiple epochs' worth of training and validation losses are shown in Figure 5. The y-axis shows the amount of loss, and the x-axis shows the total number of epochs. The degree to which the model's predictions agree with the real labels is indicated by the loss. As training continues, the loss should go down, which means the model is getting better. When there is a large disparity between the two sets of losses, it could be an indication of overfitting, in which the model does well on the former but badly on the latter.

4.2 Performance of MNIST-64

Examining how well the MNIST-64 model detects melanoma is the focus of this section. Our comprehensive evaluation of the model's efficiency will be laid out in tabular form.

The MNIST-64 model trained with a remarkable 100% accuracy rate. That the model achieved flawless classification on the training data is evident from this.

Concerning training loss, the MNIST-64 model achieved an extremely low value of about 0.0040. A small loss number suggests a good match between the model and the training data.

Verification Accuracy: The MNIST-64 model preserved a high level of precision of around 98.53% throughout the verification procedure. Because of this, we can observe that the model can successfully generalise to new data.

For MNIST-64, the validation loss was 0.0698, indicating strong generalisability. This is a reasonably low value.

4.2.1 MNIST-64 Accuracy

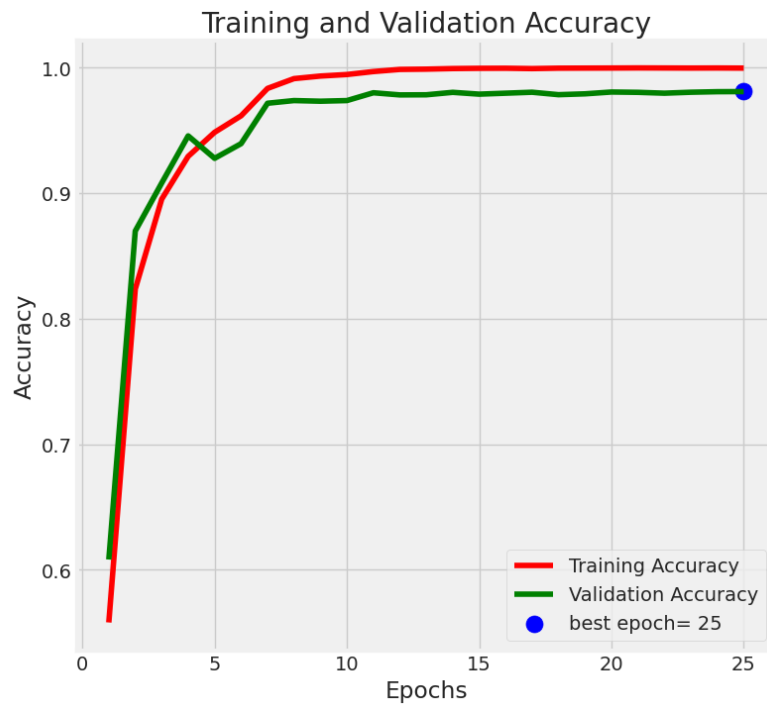


Figure 6: *Training and Validation Accuracy*

Training and validation accuracy are shown over time in Figure 6. The x-axis shows the number of epochs, while the y-axis shows the percentage of accuracy. It is anticipated that accuracy will improve as training continues. You can tell how well a model generalizes by looking at the gap between its training and validation accuracy. A model could be over fitting if its training accuracy is much greater than its validation accuracy.

4.2.2 MNIST-64 Loss

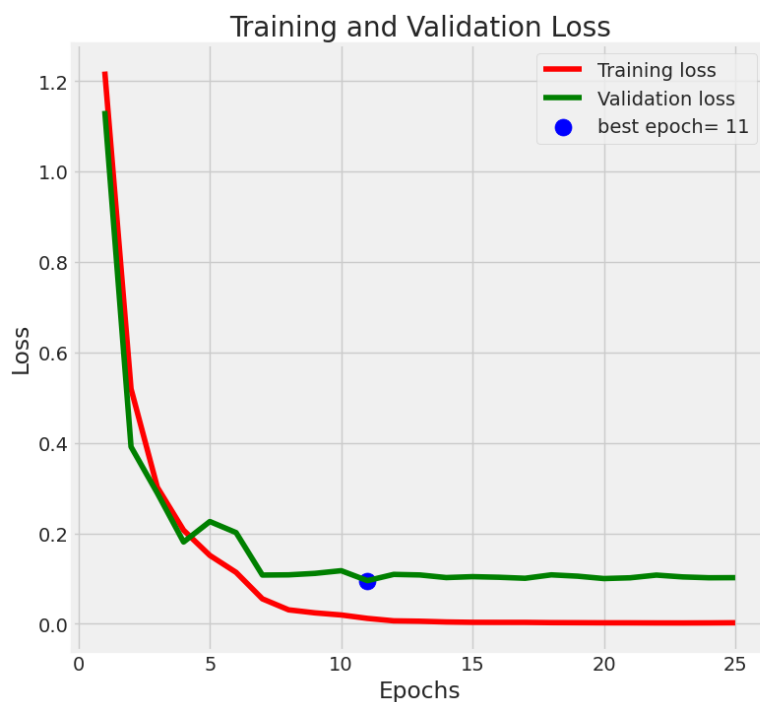


Figure 7: Training and Validation Loss

Figure 7 shows a graph comparing the training loss and validation loss over multiple epochs. The x-axis represents the number of epochs, and the y-axis represents the loss value. Training loss indicates how well the model fits the training data, while validation loss measures its performance on unseen data. A decreasing loss curve suggests that the model is learning. However, if validation loss diverges from training loss, it may indicate overfitting (where the model memorizes the training data but performs poorly on new data).

4.3 Comparison

The performance of four different deep learning models MobileNet, MNIST-64, was evaluated on the melanoma detection task. MobileNet achieved an accuracy of 86.37% on the test dataset, while MNIST-64 achieved a significantly higher validation accuracy of 98.53%. MNIST-64 outperformed MobileNet in terms of accuracy, but it also achieved a perfect training accuracy of 100%, which suggests a potential risk of overfitting.

5. Conclusion

In this research, we explore the application of state-of-the-art deep learning methods on the task of diagnosing melanoma using MobileNet V2 and a custom trained MNIST- 64 model. We also find that the MNIST-64 model is superior to MobileNet V2 in terms of accuracy with an accuracy of impressive 98.53% on the validation set in contrast to 86.37% by MobileNet V2. The MNIST-64 model on the other hand showed symptoms of overfitting, given the 100% training accuracy, meaning the model might have issues with generalizing on unseen examples. Both models were advantageous for employing adaptive feature fusion, transfer learning, and attention mechanisms, which enabled them to concentrate on significant features of skin lesions, i.e., irregular borders and particular textures, and subsequently, increasing the accuracy of the classification. These methods permitted a more stable and efficient model that could distinguish benign lesions from malignant lesions more accurately than conventional approaches. Although the MNIST-64 model is a higher-accuracy model, it is computationally expensive and over fits easily, which is not very applicable to real-time, limited-resource applications. On the other hand, MobileNet V2 for a lighter model and less computational cost, provides a more balance solution, but a bit lower accuracy for speed. This study demonstrates the promise of AI-driven melanoma detection systems for altering the diagnostics of dermatology practice. With increased efficiency and improved melanoma diagnosis automation, such models could help doctors make better choices and contribute to earlier detection and better patient outcomes.

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The Impact of AI-Based ESL Instruction on the Development of Cognitive and Emotional Intelligence in Children: A Cross-Cultural Study of Iranian and Canadian Learners

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Abstract

This study investigates the effect of artificial intelligence (ESL)-based English language teaching on cognitive development and emotional intelligence (EI) of children in Iran and Canada. The study compares two groups of children aged 6 to 12 from both countries who are exposed to AI-based ESL platforms. The findings show that artificial intelligence-based ESL training not only increases cognitive skills such as memory, attention and problem solving, but also positively affects emotional intelligence including self-regulation and empathy. Furthermore, it was found during the study that Canadian children, who have wider access to AI-based learning tools, perform better than Iranian children not only in English but also in learning other languages. This data and information is taken from the author's dissertation, which is currently being prepared for defense and took approximately eight months of research and revision. Additionally, this study shows how AI-powered learning can save time and provide universal access to essential resources for all children.

Keywords: *Artificial Intelligence, ESL, Cognitive Skills, Emotional Intelligence, Cross-Cultural Study, Children, Iran, Canada*

1. Introduction

Artificial Intelligence (AI) has revolutionized educational practices, particularly language learning. AI-powered platforms offer personalized and adaptive learning experiences that meet the unique needs of learners. This is particularly important in the context of teaching English as a second language (ESL) to children, as AI tools can provide dynamic and interactive environments that enhance not only language acquisition but also cognitive and emotional development.

The main objective of this study is to investigate how AI-powered ESL instruction affects the cognitive and emotional intelligence of children in Iran and Canada. The purpose of this research is to investigate whether AI-based ESL platforms can improve cognitive skills (such as memory, attention, and problem solving) and emotional intelligence (including self-regulation, empathy, and social awareness) among children from different cultural backgrounds. The study also compares the performance of Iranian and Canadian children given that AI-based learning has been more widely integrated into Canadian education systems.

2. Literature Review

The Role of AI in Education

Artificial intelligence has become an integral tool in education that provides personalized and adaptive learning experiences. AI platforms can adjust the level of difficulty, pace and content based on student progress. In the context of language learning, AI tools provide immediate feedback, customized lessons, and interactive learning environments, all of which help improve language skills (Seldon & Abidoyeh, 2020).

In the field of second language learning (ESL), artificial intelligence-based tools such as linguistic models, speech recognition systems, and virtual tutors have shown promising results in helping children learn new languages more effectively and efficiently. These tools not only improve language skills, but also strengthen cognitive processes related to language learning, such as attention, memory, and problem solving (Ramos and Garcia, 2021).

Cognitive and Emotional Intelligence in Children

Cognitive development refers to the process by which children develop their abilities to think, learn, and problem-solve. Cognitive skills such as memory, attention and reasoning are essential for academic success and overall development (Nisser, 2014). On the other hand, emotional intelligence (EI) includes the ability to recognize, understand, and manage one's own emotions, as well as empathize with others (Golman, 1995).

Cognitive and emotional development are both very important for the overall development of children and their development can be affected by various factors including learning experiences.

Research has shown that AI-based learning platforms can foster cognitive and emotional development by providing a structured yet flexible learning environment that encourages self-regulation and emotional development (Zhao et al., 2020).

Cross-Cultural Differences in Language Learning

Cultural factors play an important role in children's interaction with educational tools. Studies have shown that children from different cultural backgrounds may have different reactions to educational technology (Chen & Carver, 2020). Specifically, cultural attitudes toward technology, learning styles, and parental involvement can influence how children interact with AI-based learning platforms. This study examines the differences between Iranian and Canadian children by focusing on their use of artificial intelligence-based ESL tools and its impact on their cognitive and emotional development.

3. Methodology

Participants

This study includes 100 children aged 6 to 12 years from Iran and Canada who are enrolled in formal English as a Second Language (ESL) programs. Participants are divided into two age

groups: Group A (6-9 years old) and Group B (10-12 years old). All children have used artificial intelligence-based ESL platforms for at least six months.

Instruments

- **AI-Based ESL Assessment:** A specialized artificial intelligence tool designed to assess English language skills, including grammar, vocabulary and pronunciation.
- **Assessment of Cognitive Skills (WISC-V):** This instrument measures cognitive abilities such as working memory, processing speed, and problem-solving skills.
- **Emotional intelligence questionnaire:** this tool evaluates emotional intelligence, including self-regulation, empathy and social awareness.
- **Parent and Teacher Surveys:** These surveys are used to collect qualitative data about children's interactions with AI tools and their cognitive and emotional behaviors.

Procedure

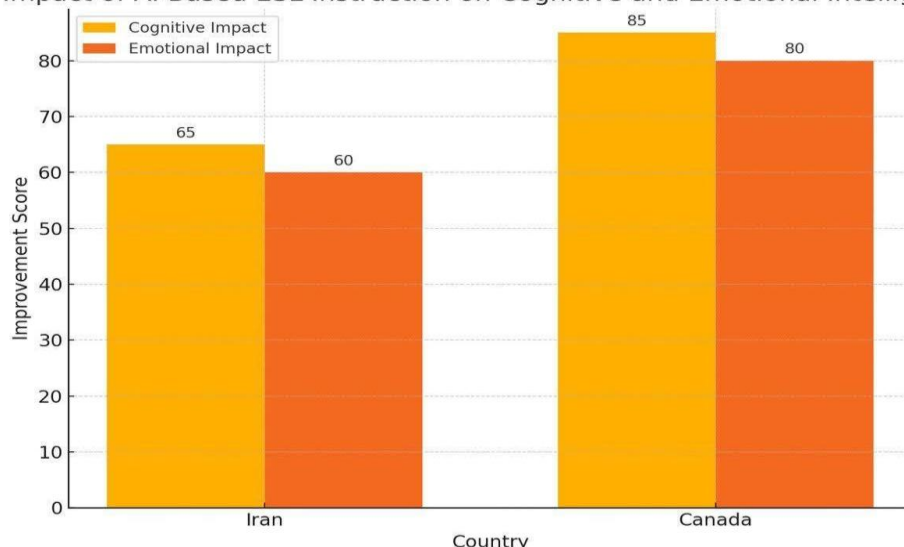
Participants are evaluated in two main stages:

1. **Step 1:** Participants complete AI-based ESL assessments to assess their language learning progress.
- 2 **The second stage:** Cognitive and emotional intelligence assessments are performed using WISC-V and emotional intelligence questionnaires. Data are collected over a six-month period to observe any changes in cognitive and emotional development.

4. Data Analysis

The data will be analyzed using SPSS (version 26) software. Descriptive statistics summarize demographic characteristics of participants. Inferential statistics including t-test and analysis of variance will be used to evaluate the differences in the development of emotional and cognitive intelligence between Iranian and Canadian children as well as between different age groups. Multiple regression analysis will be done to investigate the relationship between learning English as a second language based on artificial intelligence and improving cognitive and emotional intelligence.

Impact of AI-Based ESL Instruction on Cognitive and Emotional Intelligence



5. Results

The results show whether artificial intelligence-based English language training has a significant effect on cognitive and emotional development, especially in areas such as memory, attention, problem solving, and emotional intelligence. In addition, during this study, it was found that Canadian children who have more access to artificial intelligence-based learning tools perform better than Iranian children, not only in English, but also in learning other languages. This data and information is taken from the author's dissertation, which is currently being prepared for defense and took approximately eight months of research and revision.

6. Discussion

The findings show that teaching English as a second language based on artificial intelligence has a positive effect on cognitive and emotional intelligence. However, the extent of this effect varies between Iranian and Canadian children, possibly due to differences in access to technology and cultural approaches to learning. Iranian children may benefit more from structured and targeted AI tools, while Canadian children may thrive in more interactive and exploratory AI learning environments.

Additionally, the results highlight the effectiveness of AI-based learning in saving time while providing universal access to high-quality educational resources.

This method not only increases cognitive development, but also supports emotional intelligence by strengthening self-regulation, empathy and social skills.

7. Conclusion

Artificial intelligence-based English as a second language (ESL) education offers significant potential for improving cognitive and emotional intelligence in children. By providing personalized learning experiences, AI tools help children develop essential cognitive skills such as memory and problem solving, while also enhancing emotional intelligence. However, cultural factors play a significant role in shaping how children interact with AI tools. This

research provides valuable insights for educators and policy makers to optimize the use of AI in language learning and ensure that all children, regardless of their cultural background, can benefit from these advanced educational technologies.

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What is the Blueprint for an ESP Course Success?

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Abstract

The paper discusses the most influential determinants of success behind English for Specific Purposes (ESP) courses, such as learner-centered design, teacher competence, incorporation of authentic materials, and extended institutional support. Based on a mixed-methods design, the research combines quantitative questionnaires and qualitative interviews with ESP teachers and university students of different disciplines. The study illustrates that effective ESP courses are those that emerge from meticulous learner needs analyses, in which linguistic and vocational needs are weighed against teaching approaches with care. Second, the role of the instructor—language expert and facilitator of discipline-specific content is revealed to be pivotal in generating relevance and interest in class. The study also examines the need to implement genuine material that reflects the target discourse community in a bid to enable not only interaction but also functional application of language. Institutional factors like curriculum flexibility, training, and assessment practice are also discussed as the most significant facilitators or barriers to effective implementation. In synthesizing these findings, the paper puts forward a working framework for the development and sustaining of successful ESP programs that are responsive to evolving academic and business environments.

1. Introduction

English for Specific Purposes (ESP) is now a fundamental area of language study, enabling students to acquire communicative competence in domain-specific contexts such as engineering, medicine, business, and law. As globalization spurred the need for effective communication across professions, the need for well-designed ESP courses skyrocketed. Successful implementation of such courses is, however, dependent on numerous interconnected factors that must be considered well at the design and implementation level. The current research takes into account factors that make a successful ESP course blueprint.

One of the most solid pillars of ESP course success is how well it reflects learners' academic or work-related requirements. Unless ESP courses are an image of actual tasks and communicative contexts learners encounter, learning and motivation are negatively affected. Needs analysis steps in to help make courses appropriate to those expectations, supplying the justification for syllabus planning, materials choice, and assessment processes. Without it, courses become de-linked from learners' realities.

In addition, the teacher also stands at the center of successful ESP provision. Teachers need not only to be proficient in language teaching but also to have knowledge of the target discipline's discourse and practices. Where such a combination of expertise is lacking, subject-matter specialists and language teachers must work together. Such a process enables more integrated, relevant teaching and allows students to cope with their work and study lives more confidently.

1.1 Purpose of the Study

The research will examine the key determinants behind the successful delivery of ESP courses, which will be a working handbook for teachers, curriculum planners, and developers. It offers actionable advice for connecting bridging courses with student requirements and teaching quality improvement through improved materials, teacher training, and school assistance.

1.2 Research Questions

2. What are the most significant factors influencing the success of ESP courses?
3. Teacher knowledge, quality of course materials, and test-taking ability have what effects on learner performance in ESP settings?
4. Institutional conditions that facilitate or constrain the delivery of ESP courses?

2. Review of Literature

The starting point of successful ESP course design is a comprehensive needs analysis. For Hutchinson and Waters (1987), the learner-centered strategy will make sure that learning goals are aligned with real communicative needs. Dudley-Evans and St John (1998) included the notion that since ESP is inherently flexible, it will need to keep pace with the evolving needs of diverse disciplines. Genre studies and corpus studies have also been informing ESP course design by enabling the language patterns and functional applications of each discipline to be identified (Basturkmen, 2010).

Instructionally, ESP instructors have typically suffered from a lack of background knowledge in specialist knowledge domains. Paltridge and Starfield (2016) suggest that dual requirement of language and content expertise might be balanced through interdisciplinary teaching teams. Hyland (2006) argues that courses in teacher education should provide teachers with pedagogic capability as well as knowledge of the content and communicative customs of the subject that the learners will study. Such courses help to ensure that language teaching is precise as well as suitable for the purpose.

Materials and assessment also play an important role in ESP achievement. Real materials texts, videos, and activities from the target working context maximize learner engagement and provide real-life exposure (Gilmore, 2007; Tomlinson, 2012). Assessment, if carried out through formative methods such as peer review, self-assessment, and task-based activity, gives learners opportunities to move forward and demonstrate their competencies in meaningful ways. Such procedures allow language development to be promoted through content knowledge.

3. Methodology

In order to provide a complete image of the factors that determine ESP course success, the study employed a mixed-methods strategy. Data were gathered at three Algerian universities with 180 participants 60 being ESP teachers and 120 students from engineering, medicine,

and business faculties. In order to justify disciplinary diversity and contextuality, the respondents were drawn with purposive sampling. Pilot study utilized closed-end questionnaires to gather quantitative feedback on five important areas: needs analysis, authenticity of materials, teacher competence, institutional climate, and exam practice. To ensure reliability and freedom of the survey instrument, the latter was pilot tested on 10 ESP instructors prior to its final utilization.

Qualitative data were collected in the second phase by using semi-structured interviews from students and teachers. Interviews were used to collect informed views, primarily on teaching matters, use of materials, and organisational relationships. Interview questions were decided to ensure comparability and consistency by basing them on survey domains. Space was also provided for emergent themes.

Subsequently, quantitative data were statistically analyzed as well to explore trends in responses given by participants. Alternatively, the qualitative data were theme-analyzed using NVivo software, thus enabling repeating trends and contextually specific information to be extracted. Through both sources of data triangulation, research was enabled to offer a holistic and balanced interpretation of the most significant determinants of ESP course effectiveness.

Table 1: *Key Factors Evaluated in the Survey*

Factor	Number of Questions	Mean Score	Importance Level
Needs Analysis	6	4.3	Very High
Teacher Expertise	5	4.1	High
Authentic Materials	5	4.2	High
Assessment Practices	4	4.0	High
Institutional Support	4	3.6	Moderate

Figure 1: Learners' Perception of Key ESP Course Success Factors
Institutional Support

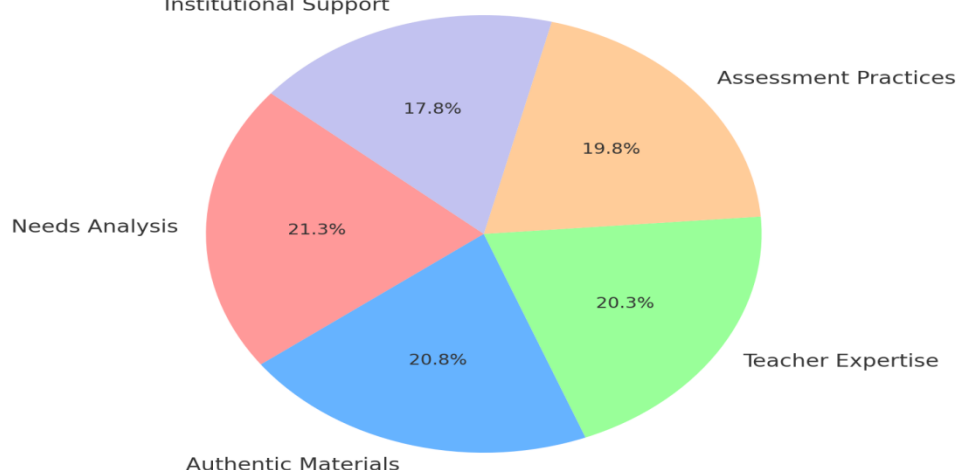


Figure 1: *Learners' Perception of ESP Course Components*

Interview data were coded thematically, and selected themes were identified. Most answers demonstrated the value of contextualized collaborative teaching, and ongoing curriculum revision as important to course success.

4. Findings

Based on the analysis of the data, the needs analysis was the highest-scoring factor, as indicated by teachers and learners regarding its function of connecting course content to actual communication tasks outside the classroom. Learners observed that upon understanding the applicability of the course materials to their working lives in the future, their attendance and performance were greatly enhanced.

Teacher ability was also recorded to have contributed. Some teachers reported feeling poorly prepared to manage highly specialized material, thus resulting in loss of student confidence. Both these strategies, such as co-teaching with content area experts, were proposed as a solution to the knowledge gap. Furthermore, students enjoyed teachers having technical ability but good language teaching skill.

Realistic materials and formative assessment procedures received maximum from all the groups. The students found writing activities, simulation, and role-playing to be the most helpful ones. Teachers demanded recent material with current practices in the industry be utilized. Institutional support, being less tension-evoking, was also mentioned to be significant in terms of professional development and sharing resources.

5. Discussion

Research insists on the utility of ESP course design based on thorough needs analysis. Without learners' communicative tasks in the areas of study, courses would be irrelevant. Needs analysis assures not only the satisfaction of learners' language requirements but also

teaching effectiveness and usefulness. This upholds the pivotal theories in ESP literature, with learner-centeredness and context-relevance being more favored.

Teacher training was likewise of first priority. The majority of ESP instructors reported they did not know how to teach technical subjects. Institutional policy should accordingly make available continual professional growth, including workshops, mentoring, and field materials. Team teaching with subject-matter experts can serve as an economical option, especially in universities having multiskilled faculties.

Lastly, the value of genuine materials and formative assessment ought not to be underestimated. The methods allow for students to practice language in the context of environments that they stand to use most in terms of their working lives, thus promoting transferability of learning. Formative assessment also supports reflective learning and student autonomy. Instructional designers, however, ought to be instructed on how to implement these measures effectively and scale them according to changing learner demands.

6. A Functional Framework for ESP Course Design

To achieve the application of the findings of this study, a functional framework for ESP course design and teaching is proposed. The system is structured in relation to five interconnected pillars, each founded on key literature in the field: needs analysis, as emphasized in Hutchinson and Waters (1987) and Flowerdew (2013); teacher knowledge, as emphasized in the works of Paltridge and Starfield (2016) and Hyland (2006); authentic materials, championed through Gilmore (2007) and Tomlinson (2012); formative assessment, as championed through Hyland (2007) and Tomlinson (2012); and institutional support, as addressed in Belcher (2006) and Dudley-Evans and St. John (1998). All these pillars together form a comprehensive and evidence-based foundation for ESP course design to be successful.

Needs Analysis: Working and academic lives of students should inform the course content based on sound needs analysis.

Teacher Expertise: Teachers should be pedagogically, and subject matter trained to deliver accurate and relevant instruction.

Authentic Materials: Authentic materials and communicative tasks should be included to reflect professional discourse behavior.

Formative Assessment: There must be regular assessments placed to enable transfer of competences and learner autonomy.

Institutional Support: There must be adequate resources, enabling policies, and collaborative approaches to teaching that will enable maintenance of ESP implementation.

Figure 2: A Practical Framework for ESP Course Design

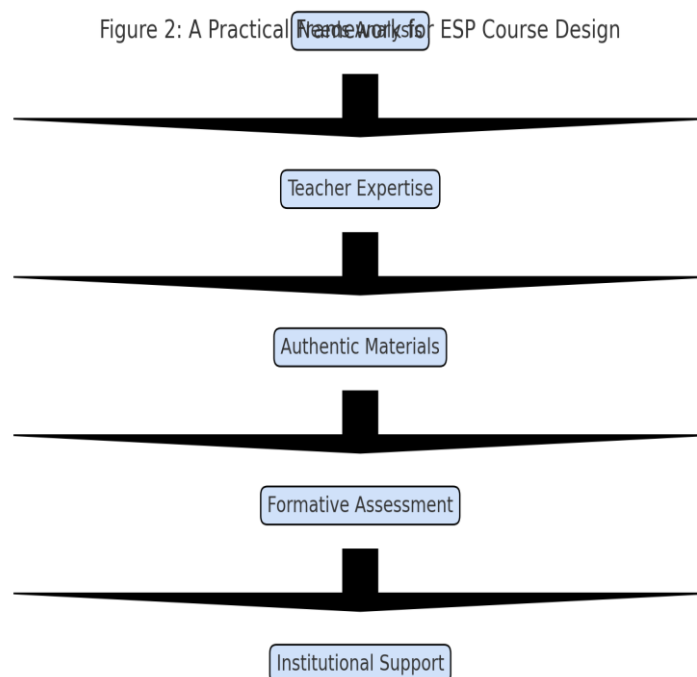


Figure 2: *A Practical Framework for ESP Course Design*

8. Recommendations

For enhanced ESP course achievement, the following are recommended:

- All ESP courses ought to initiate with an adequate needs analysis of stakeholders of the target field.
- ESP instructors need to be given recurrent training in language pedagogy as well as in the field.
- Institutionally supported coverage ought to be offered through team-teaching mechanisms with language as well as subject-matter experts.
- Course developers must utilize authentic texts and tasks to mirror the communicative contexts that the learners will face.
- Regular, low-stakes monitoring must be welcomed to monitor progress and inform teaching.
- Universities must invest in policy guidance, training, and provision focused on ESP teaching.

8. Conclusion

ESP courses are on course to fill an essential role in supporting learners to reach communicative competence for use in specific work and study contexts. The studies have demonstrated that the success of such courses hinges upon a set of interdependent conditions,

most significantly rigorous needs analysis, professionalism in teaching, genuine materials, and institutional commitment at a constant level. A successful ESP course will need to balance teaching aims and learners' real workplace needs while creating a culture for collaboration, critical thinking, and pedagogic responsiveness.

In the future, ESP courses need to become content-and-language-integrated. Institutions, instructors, and curriculum developers need to work together so that ESP provision remains learner-focused, discipline- and workplace-specific, and adjusted to shifting disciplinary and workplace needs.

Besides, additional study is needed to determine the effectiveness of employing AI-supported tools for support in the delivery of ESP, especially within low-resource contexts. Long-term investigations should likewise determine the sustained impacts of co-teaching pedagogies and formative measurement techniques on the students' results as well as teacher readiness.

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Common Features of Brand Names of Artificial Intelligence Models

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Abstract

This study suggests that the brand naming of widely used AI models reflects a pattern of knowledge co-construction through interactive language between human users and algorithms, resembling the role of a guide or capable peer. Viewed through a human-plus-machine lens, these brand names simulate engaging, collaborative, and learner-centered processes in informal yet meaningful settings. Applied linguists play a key role in crafting names that convey facilitation and partnership, often using metaphors to foster emotional resonance and user engagement. The methodology involved selecting top AI brand names and analyzing their literal and metaphorical meanings to identify underlying patterns. For example, ChatGPT suggests open dialogue; Gemini (Latin for twins) implies duality, adaptability, and collaboration. Grok evokes deep, intuitive understanding. Claude resembles “cloud,” symbolizing connection and real-time collaboration. DeepSeek suggests depth in exploration. Copilot implies supportive teamwork and shared control. These metaphorical associations help position AI not as distant tools but as accessible, intelligent partners in the learning and decision-making. The naming strategies reveal how language and metaphor are central in shaping user perceptions and interactions with AI technologies.

Keywords: *applied linguistics, brand naming, Artificial Intelligence models*

1. Introduction

Artificial intelligence has become deeply embedded in various aspects of contemporary life, influencing sectors such as education, healthcare, business, and the creative industries. As AI systems evolve from mere tools to active collaborators, the importance of their branding, particularly their names, grows significantly. A brand name is not merely a label; it shapes initial impressions, emotional responses, and long-term engagement. In the case of AI, where human-computer interaction is increasingly nuanced, a name can evoke familiarity, trust, or even a sense of partnership. A brand name's phonetic appeal, conceptual clarity, and linguistic adaptability can all contribute to how the technology is perceived and accepted. This study focuses on the strategic use of language in the naming of AI systems, highlighting how sound and meaning in brand names play a critical role in shaping user perceptions and experiences.

2. Literature Review

Research has shown that brand names function as powerful linguistic tools that influence consumer perception beyond serving as simple labels. Selecting the right brand name is vital for businesses, as the brand name alone is believed to contribute around 40% to a company's success in the market (Zaltman & Wallendorf, 1979).

When selecting a brand name, it is important to consider its sound and meaning (Klink, 2000). The sound characteristic of a brand name refers to how it is perceived by others, regardless of whether it has a specific meaning. In contrast, the meaning characteristic relates to what the brand name is understood to represent (Lee & Baack, 2014). In other words, a brand name should convey the core qualities of the brand, sound appealing, be adaptable to different languages globally, and have characteristics such as simplicity, familiarity, distinctiveness, ease of understanding, pronunciation, and spelling (Keller, 1993; Wänke et al., 2007).

In addition, consumers themselves recreate or simplify brand names. For instance, to make them easier to pronounce, consumers may abbreviate names such as Chevrolet to Chevy, Pan American Airways to PanAm, or Coca-Cola to simply Cola (Robertson, 1989).

The brand name should also be evaluated from a phonetic analysis perspective to understand how it influences consumer perception. For example, the vowel sounds in a brand name, whether front vowels (e, i, ö, ü) or back vowels (a, ı, o, u), can have a significant impact on how consumers perceive the product's attributes, such as its softness, heaviness, or even flavor (Baxter & Lowrey, 2011; Sapir, 1929). Studies on this topic also show that men and women respond differently to brand names with different vowels (Klink, 2009).

Furthermore, from a phonetic perspective, including similar sounds or letters in a brand name is considered an effective method for creating a strong brand identity. For example, the name Picture Perfect TV is more memorable than alternatives like Picture Superior TV—which, while trying to convey a similar meaning, lacks the same flow—or abbreviations such as PP TV or PS TV (Lee & Baack, 2014). The repetition of similar sounds in Picture Perfect TV and its effort to communicate a clear meaning make it a more effective and memorable brand name (Lee & Baack, 2014).

Since applied linguistics aims to identify, research on, and find practical solutions to real-world, real-life issues, problems, and contexts, this pursuit requires adopting the transdisciplinary approach of applied linguistics. “Branding relies heavily on language, and consumers often come to know a brand through language -the language in advertising or on packaging, the words used in social media or word-of-mouth, and even brand names themselves, serve to communicate the meaning of a brand and influence perception, memory, attitudes, and behavior” (Carnevale, Luna, & Lerman, 2017, p.572). Using a framework integrating the language-related disciplines of psycholinguistics, sociolinguistics, and semiotics, Brand Linguistics takes models and findings from these and “maps them to the consumer-brand relationship, creating new theory and perspectives on the processes underlying the consumer psychology of brands” (Carnavale et al., 2017, p.587).

Recent studies highlight that brand names serve as more than simple identifiers; they are semiotic tools that shape how users cognitively and emotionally engage with AI systems. A brand name influences the user's readiness to trust and interact with the model/tool when the name effectively associates engaging, facilitative, interactive, collaborative, context-rich, and student-centered processes in informal settings, which do not confuse informality with sloppiness but, on the contrary, exhibit depth of personal, meaningful interaction. Especially highlighting the fact that the social and cognitive constructivisms can be observed in mobile learning settings, Yakar, Sülü, Porgalı and Çalış (2020, p.71) highlight the key aspects in the

relevant literature explaining the integration of mobile technologies into learning “such as interaction, collaboration and authentic experience. These create an informal atmosphere where social and cognitive constructivism can easily be implemented and contribute to formal lessons”. The key term put forward is mobile constructivism with principles of ubiquitous interaction, dynamic learning network, and informal learning settings. The research they referred to explains how mobile technologies are integrated in learning and how they help learners and educators with the key aspects of constructivism, such as interaction, collaboration, and authentic experience. These create an informal atmosphere where social and cognitive constructivism can easily be implemented and contribute to formal lessons.

According to Lukose, Cleetus, Divya, Saravanakumar,& Jose (2025, p.269), “branding innovations are increasingly caused by developments within the fields of machine learning, analytics on social media networks, and sentiment analyses” but the focus in future research could be on the ways “brands can balance the use of AI with the need to connect in an authentic, human-like way to their audience” given the risk of losing brand authenticity stemming from AI overuse, which could also alienate the very consumers looking for “personal and human-brand relationship.” As Lukose et al. (2025, p.270) end their article, the “merger of branding, linguistics, and advanced technologies presages a bright prospect both for academic research and practical applications with a view to the future of branding.” As a concrete alternative exemplified focused in Yorkston and Menon (2004) and Klink (2000), both of which seem to grasp how the sounds of brands as words significantly impact consumer behavior especially in marketing contexts, future research can tap into the ways sound symbolism influence the ways consumers perceive products and brands or affect judgements related to them.

3. Methodology

The present study has identified a list of brand names of the top AI models, which have been searched for their literal meanings, the straightforward dictionary-given denotative meanings. Subsequently, these brands were explored for metaphorical meanings to ascertain relevant interfaces. The investigation was then turned to the question of whether the literal-metaphorical meaning interfaces could be said to discern a pattern within the transdisciplinary approach to applied linguistics. The substantial body of evidence that has been posited by scholars from the 1980s onwards indicates the significance of metaphors as pivotal elements in human conceptualisation, which is contrary to the limited perception of them as mere figures of speech figuration (Lakoff & Johnson, 1980; Lakoff, 1987)

4. Findings and Discussion

To analyze how brand names function as linguistic scaffolds, we examine each example across three dimensions: phonological construction, semantic/metaphoric framing, and its role in socio-cognitive positioning. Below are refined and comparative interpretations of key brand names from the sample set:

1. ChatGPT (OpenAI): Chat implies casual, informal dialogue, while GPT (Generative Pretrained Transformer) underscores technical sophistication. The name suggests an accessible yet intelligent conversational partner.

2. Gemini (Google): Gemini, Latin for twins, connotes duality and cooperation. In astrology, Gemini symbolizes adaptability and communication qualities essential in AI human interaction.
3. Claude (Anthropic): Resonant with cloud, Claude suggests ubiquity, flexibility, and support. The name evokes the idea of a constant presence, like the cloud systems that enable real-time collaboration.
4. Deep Seek: The prefix deep signals depth and intelligence (as in deep learning), while seek implies exploration. Together, they portray the AI as an insightful assistant.
5. Copilot (Microsoft): A co-pilot assists the captain, sharing control and enhancing safety. The metaphor positions the AI as a supportive collaborator, not a replacement.
6. Bard (Google): The word Bard historically refers to a poet or storyteller. It evokes creativity, imagination, and the transmission of knowledge through narrative. This aligns with AI's role in generating content and supporting creative processes.
7. Replika: Replika suggests replication or mirroring. As a digital companion designed for emotional interaction, the name reflects its function as a reflective, empathetic presence. It emphasizes emotional scaffolding and user bonding.
8. Perplexity: Perplexity triggers associations with curiosity and deep inquiry. In the context of language models, it is also a technical term indicating uncertainty. The name positions the AI as a partner in intellectual exploration.
9. Jasper: Jasper is a human-sounding, friendly, and easily memorable name. It creates a sense of personalization and approachability, encouraging users to form an emotional connection and trust the assistant.
10. Grok: Grok is an artificial intelligence system based on a large language model (LLM), developed by xAI, a company founded by Elon Musk, and integrated into the platform X (formerly known as Twitter). The primary objective of Grok is to utilize natural language processing (NLP) techniques to comprehend user interactions and generate meaningful responses. Unlike other similar AI models, Grok distinguishes itself through its direct access to real-time data on the X platform, thereby enabling a continuous and up-to-date flow of information.

It should also be noted that the convenience of the AI apps downloaded to smartphones or other mobile devices is a key factor in the principles of mobile constructivism referred to above. As described in the findings section, the brand names of AI models support the pattern this paper claimed to detect in the brand naming of the top-of-the-list AI tools. The study has focused on the brands considered in this study to be representative due to their more pervasive use. The selection can surely be expanded. For instance, sider.ai, a brand that evokes the feeling of something by our side, but the findings section is adequately detailed. For instance, AI brand names that evoke social metaphors (e.g., Copilot, Replika) can enhance user acceptance by creating relational expectations, while those suggesting creativity or exploration (e.g., Bard, Perplexity) reinforce curiosity and engagement. Grok is a Martian word which roughly means “to deeply understand” or “to empathize completely,” implying a

profound, intuitive grasp that extends beyond mere intellectual knowledge. Such examples underscore the role of applied linguists and naming strategists in shaping not just product identity but user experience design. In short, brand naming is not a superficial marketing decision; it is a fundamental layer of socio-cognitive interaction design.

5. Conclusion

The findings of this study align with the reviewed literature, reinforcing the idea that brand naming in AI is not merely a technical or marketing task but a crucial element of interaction design. The analysis confirms that the names of prominent AI tools reflect a clear pattern: they evoke metaphors of partnership, support, and exploration, which help users feel more connected to these systems. Brand names like Copilot and Replika foster relational expectations, while names such as Bard or Perplexity stimulate curiosity and engagement. The name *Grok*, for example, implies a deep, intuitive understanding that transcends mere functionality.

This paper has focused on widely adopted AI tools whose brand names exemplify these patterns. While the sample could be expanded to include other brands such as *sider.ai*, which suggests the idea of companionship, the analysis already provides sufficient insight. The convenience of accessing AI applications through mobile devices further supports the integration of branding with mobile constructivist principles.

Ultimately, brand naming plays a foundational role in shaping the user experience and should be considered a vital component of socio-cognitive interaction design. Future research could further explore how sound symbolism affects user perception, building on foundational work that shows how linguistic elements—particularly phonetics—affect brand judgment. In this regard, applied linguists and naming strategists hold a key role in ensuring that AI technologies connect with users in meaningful and human-centered ways.

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EmoPlay: A Study on Autism Spectrum Disorder and a Mobile Game for Teaching Emotions

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Abstract

Emotions form the basis of communication between people. It is essential to understand the feelings of other people during communication and to express one's own feelings. Individuals with Autism Spectrum Disorder (ASD) experience difficulties in recognizing facial expressions and expressing their emotions. While traditional therapy methods are widely used, digital games have proven to be a more effective and motivating tool in the therapy process. In this study, a mobile game based on specific game mechanics and dynamics was designed and developed to support emotion recognition skills in children with ASD. A design-based research methodology was adopted, incorporating expert feedback at various stages, and the game was refined through iterative design cycles. In the pilot study, data were collected from students individually at each stage of the game for further analysis. As a result of the observations and analysis of the collected data, it was revealed that the levels in the game, the user-friendly interface and feedback mechanisms increased the attention and motivation of the children. Additionally, game mechanics such as selecting facial expressions, providing feedback, and story-based interactions were found to contribute to the learning process. To support individualized learning, the game allows unlimited replayability. This study explores relevant literature, the theoretical framework behind the game, its development process, and potential future directions.

Keywords: *Autism spectrum disorder, Emotional Games, Play Therapy, Affected Games, Serious Games*

1. Introduction

Autism Spectrum Disorder (ASD) is one of the most common neurodevelopmental disorders worldwide (Gillis et al., 2011). Individuals with ASD primarily experience difficulties in communication and social adaptation (Andrews, 2011). These challenges can significantly impair daily social interactions due to low social competence (Gillis et al., 2011). First described by Leo Kanner in 1943, ASD is characterized by limited social communication, repetitive behaviors, and restricted interests, with varying severity among individuals (Gurbuz Ozgur et al., 2025). Children with ASD exhibit different symptoms and severity levels. They

often show limited interest patterns and repetitive behaviors, alongside challenges in social communication (American Psychiatric Association, 2013; Chiang & Lin, 2007; Khowaja & Salim, 2013). One major difficulty is recognizing and expressing dynamic facial expressions (Adolphs et al., 2013). Emotions, usually conveyed through facial expressions, speech, and body language, are essential in social interactions. While individuals with typical development easily interpret emotional cues, children with ASD struggle with recognizing, classifying, and interpreting emotions (Bottema-Beutel, 2017). Improving emotional awareness can enhance both social relationships and academic success in individuals with ASD (Baron-Cohen et al., 2000). Early emotion teaching plays a crucial role in supporting social-emotional development and improving cognitive, social, and functional skills (Gurbuz Ozgur et al., 2025). However, due to the heterogeneous nature of ASD, interventions must be tailored to individual needs by considering factors such as age, cognitive and language abilities, social communication, executive functions, and co-occurring conditions (Schreibman et al., 2015; Lord et al., 2020). To enhance emotion teaching, integrating technology with traditional methods has proven effective. Tools like augmented reality (AR), virtual reality (VR), audiovisual applications, and artificial intelligence (AI) support emotion recognition and interpretation (Radu et al., 2020; Chen et al., 2020). Mobile applications and interactive digital stories allow children to practice repeatedly at their own pace (Miller et al., 2021). Game-based learning is especially prominent in this area. With the widespread use of smartphones, mobile games have become accessible and appealing to all age groups. Games provide comfort, motivation, and entertainment, creating an engaging environment for learning (Salen & Zimmerman, 2004). When designed with appropriate mechanics (e.g., rewards, levels) and dynamics (e.g., motivation, cooperation), digital games for children with ASD can effectively support learning goals and sustain engagement. **Serious games**, developed with educational or therapeutic goals, are especially effective in improving emotion recognition, empathy, and appropriate social behavior in children with autism (Anderson et al., 2017; Tsikinas & Xinogalos, 2019). Despite the absence of a direct cure for ASD, emotional skills can be improved with expert-led interventions. However, therapy sessions can be costly and difficult to access due to physical or social limitations (Horlin et al., 2014). This creates a demand for supportive applications that can be used anytime, anywhere. In this context, our mobile game project aims to help children with ASD recognize and interpret emotions in an engaging and flexible environment.

According to Ekman, the seven basic emotions are happiness, sadness, fear, anger, disgust, contempt, and surprise. Each emotion has specific facial and physical reactions, such as smiling for happiness or crying for sadness. These universal expressions provide important cues in communication (Ekman, as cited in Gilleade, 2005). Emotional games are designed to help users understand these cues and, in some cases, use biofeedback to monitor physiological responses (Allanson & Fairclough, 2004). The ACE model (Assist me, Challenge me, Emote me) guides emotional game design by focusing on supporting the player, offering suitable challenges, and triggering emotional engagement. Andrews (2011) highlights how serious games and virtual learning environments can support psychological therapy and emotional education through simulation and interactive design. In this context, games that blend learning with emotional skill-building offer strong pedagogical value. A notable example is FaceMe,

an AR-based game that helps children with ASD learn facial expressions and develop emotional understanding. The game uses a virtual agent, scenario-based learning, and game mechanics to teach facial cues. Research shows that FaceMe increases social behaviors and emotional comprehension in children with ASD (Li et al., 2023). Zakari et al. (2014) reviewed around 40 serious games targeting children with autism, categorizing them by technology platform, graphics, game direction, and interaction style. These games often aim to enhance communication, social behavior, creativity, sensory processing, and cognitive skills, using devices like keyboards, mice, and touchscreens. Mobile-based games have shown particular promise in helping children express emotions and improve interaction levels. Other systems, such as Kinect-based computer-assisted therapies, also show potential by tracking physical movements and offering interactive training scenarios (Akbulut, 2015). The integration of information and communication technologies (ICTs) in therapy offers flexible, motivating, and individualized learning experiences (Grossard et al., 2017). In summary, technological tools—especially serious games—are highly promising for supporting emotional development in children with ASD. They provide flexible, engaging, and effective learning environments tailored to the individual needs of children (Altinok & Arıcı, 2024; Kokol et al., 2020)..

Purpose of the Study

The primary purpose of this study is to examine the design and development process of a mobile game aimed at teaching emotional states, and to systematically present the improvements made based on expert opinions during this process. The study was conducted following a design-based research approach and aims to document how the educational and technical aspects of the mobile game were developed with expert feedback. Within the scope of the research, the game design process was handled iteratively; prototype versions were continuously reviewed and improved according to the opinions of experts in special education, psychology, and educational technologies. Qualitative data obtained from expert opinions were analyzed to identify which aspects of the game's content, interface, user experience, and pedagogical appropriateness were enhanced. In this respect, the study aims to contribute to the development process of digital materials for emotion teaching and to guide practitioners and researchers in the design of game-based learning environments.

Research Questions

1. According to expert opinions, what are the positive features of the mobile game developed for teaching emotional states during its design process?
2. What are the experts' suggestions regarding revisions needed for the mobile game developed for teaching emotional states?

2. Method

This study was conducted using the Design-Based Research (DBR) method. Design-Based Research is an approach that aims to produce both theoretical and practical knowledge through iterative design processes carried out in applied settings. The purpose of the study is to develop a mobile game that supports individuals with special needs in recognizing and

expressing emotions, and to continuously improve the game based on expert feedback until the final version is achieved. The development process was carried out in three main stages: (1) identifying needs and designing the initial prototype, (2) revising the prototype based on expert feedback, and (3) evaluating the final design of the game in Figure 1.

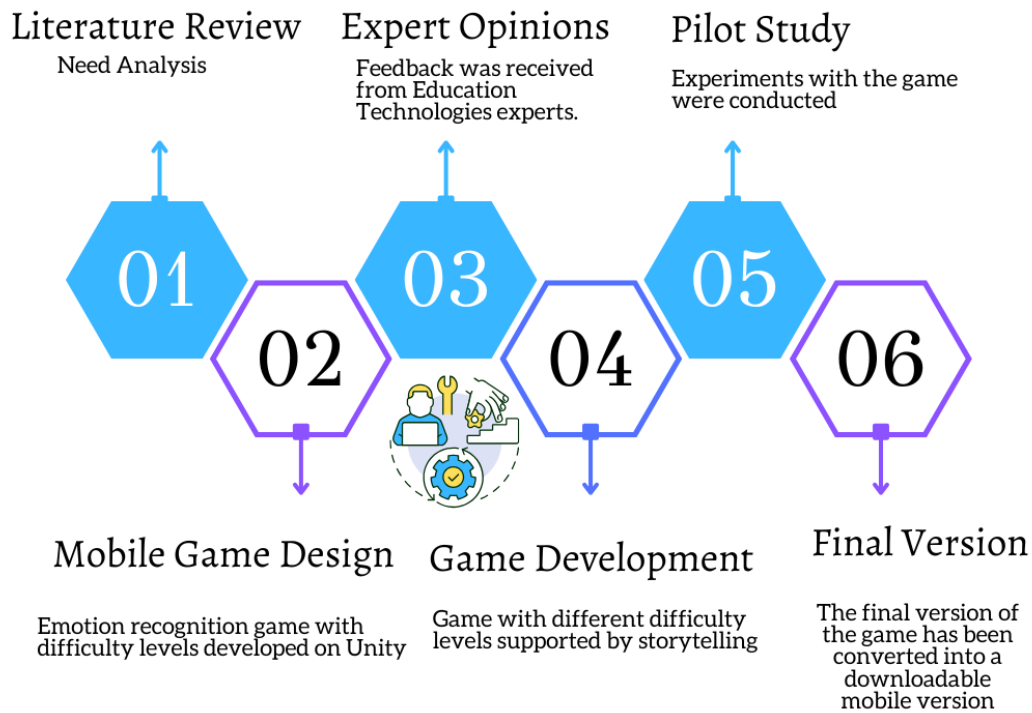


Figure 7. *Game Design Process*

In each iteration cycle, qualitative data were collected from expert academicians and practicing teachers specializing in special education, psychology, and educational technology, and the design process was guided based on these data. Information about the experts is presented in the Figure 2.

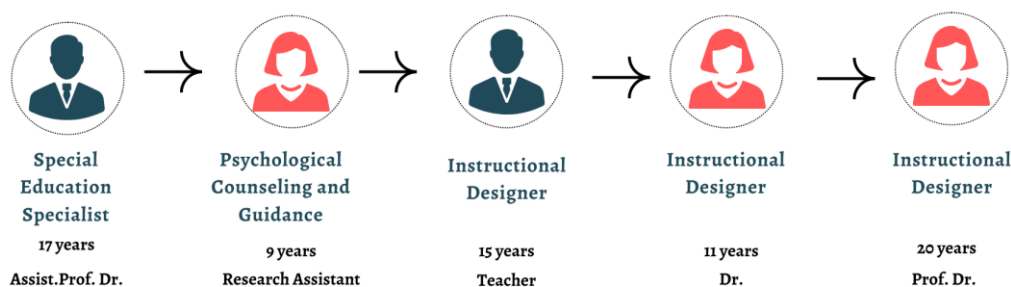


Figure 8. *Experts*

Three academic experts specializing in instructional technology, one academic in special education, and one academic with expertise in guidance and counseling participated in the expert review process for the study.

Implementation- Game Design Process

Although adults often express their emotions with words in addition to gestures, it can be difficult to perceive emotions nonverbally. Especially children with autism spectrum disorder have a hard time understanding emotions from facial expressions, which forms the motivation for this work. The project to be developed within the scope of this study is being developed with the Unity game engine. While the game flow and controls are carried out entirely on unity, the software infrastructure and developments are developed with the C# software language within visual studio. Also, open source infrastructure libraries are used for face recognition, emotion analysis and interpretation, and Barracuda infrastructure is used for unity support. While it was developed in stages, various edits and additional improvements were made according to the feedback received from experts throughout the development process (Figure 3).

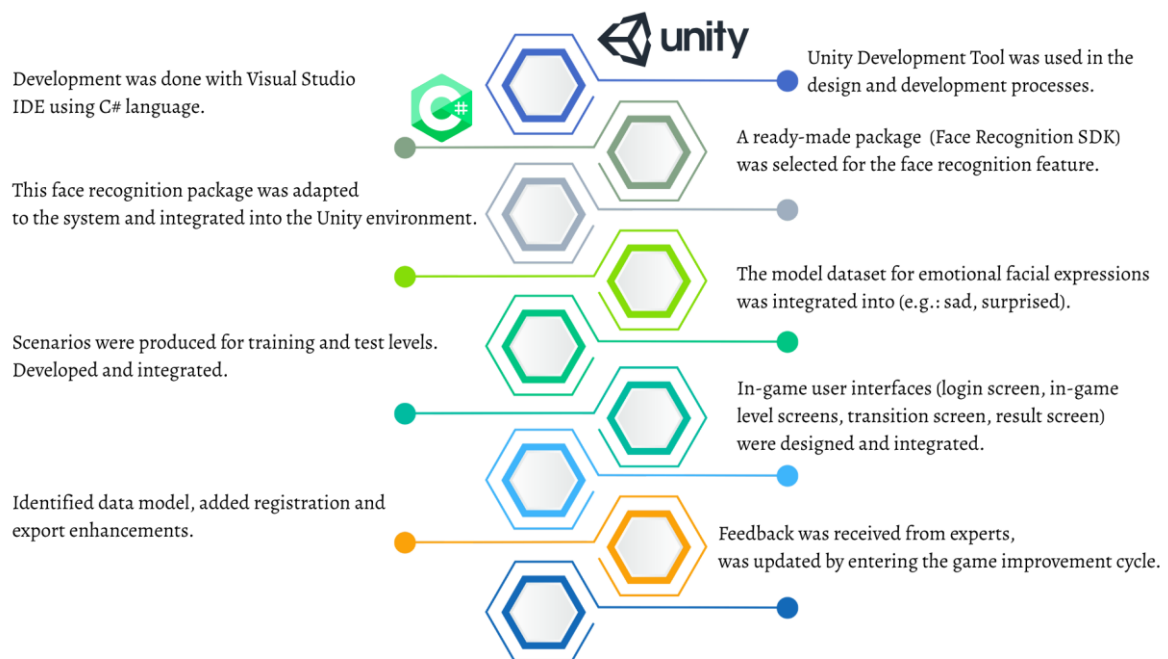


Figure 9. *Unity Process*

First of all, when the game opens, we encounter a registration screen. On this screen, there are fields where you can enter the player's name, surname, age and details of the player's special status, if any. When this screen is passed, the player chooses the difficulty level that contains the number of emotional expressions. The emotions here are sad, happy, surprised, excited and scared. After this screen you can start the game. The game consists of 5 stages with pre and post test stages. The pre- and post-test are the same, but here the player is asked about the emotion indicated by the lego image and is expected to mark the appropriate one from the options below. The correct choice is supported with audible positive reinforcement and confetti animations. For incorrect choices, the child is encouraged to try again with negative-neutral reinforcements. Subsequently, our first level is applied in the logic of a card matching game. Here, the player is expected to match the same images, while reinforcements aim to encourage the teaching of emotion. In the next level, which is the story level, the short story in that visual is played aloud to the child accompanied by a visual and the child is expected to

choose which emotion is emphasized in this story from the lego emotion expressions. The level before the last test, imitating the emotion with facial expression, is expected to imitate the emotion shown by the student himself/herself. Here, the mathematical similarity is checked dozens of times per second by the face recognition algorithm, and if the similarity threshold is met, the next emotion is passed correctly in Figure 4.

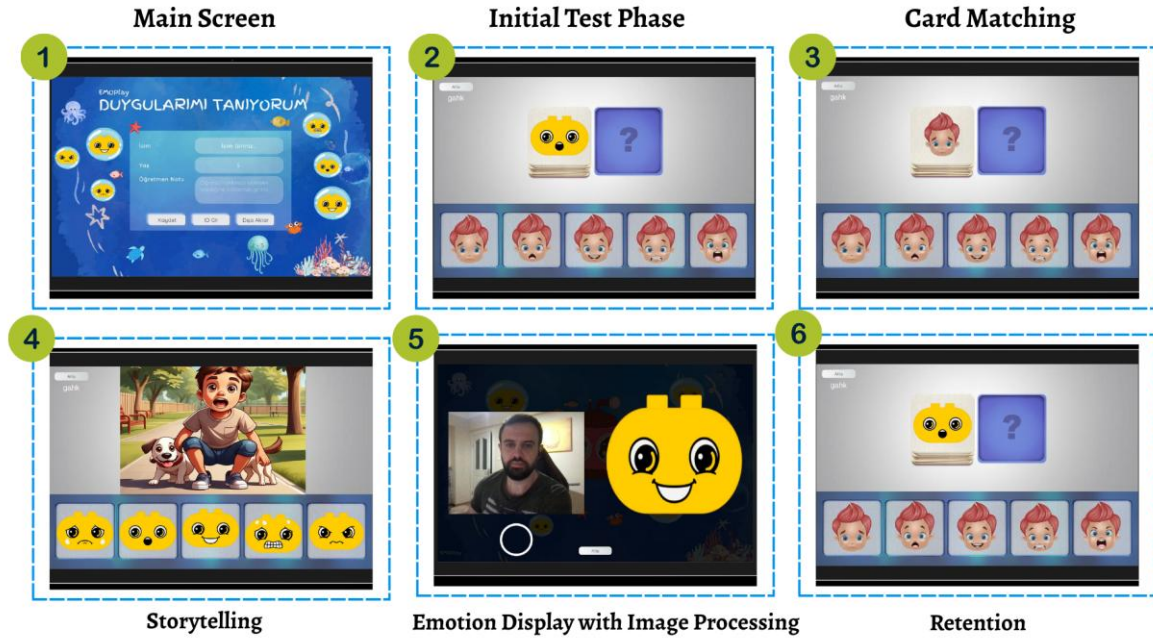


Figure 10. *Game Phases*

Finally, the emotion recognition test that we applied at the beginning is performed again. Data such as how much time the player spent at each stage, how many attempts they completed, whether they chose to continue without completing, and so on, during all stages, including the initial and final test phases, is recorded in a custom model and can be exported in bulk for analysis. The aim is to observe the child's development before and after the process.

Evaluation of the Game According to Expert Opinions

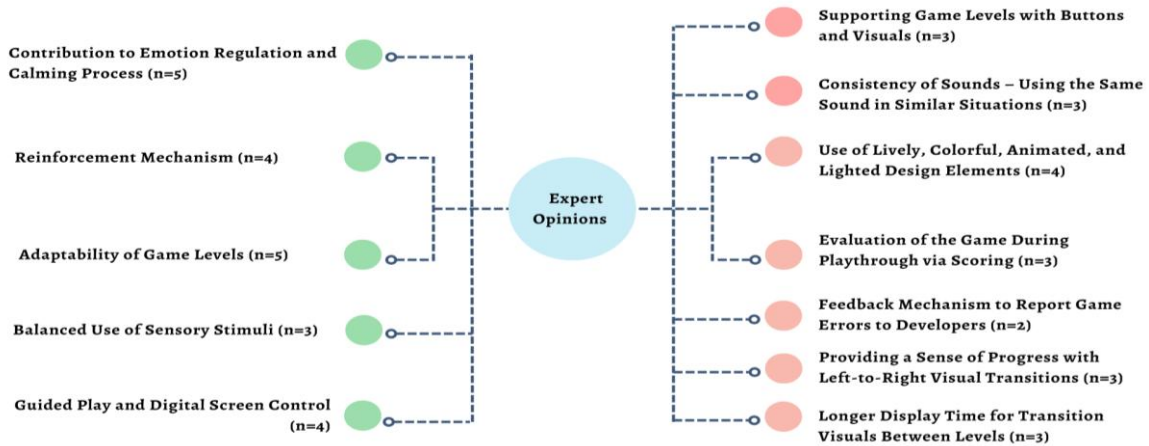


Figure 11. *Expert's Opinions*

The experts' views on the game have been categorized under positive features and features needing revision. The figure below presents the experts' positive opinions and their recommendations for corrections expected to be implemented in the game in Figure 5.

Positive Features

Contribution to Emotion Regulation and Calming Process (n=5)

All experts noted that children with Autism Spectrum Disorder (ASD) experience high levels of arousal due to sympathetic nervous system activation during anger outbursts, and that the game can help activate the parasympathetic nervous system to aid in relaxation and calming. Controlled use of sensory stimuli such as sound, color, and rhythm may facilitate this transition.

“If the child transitions to the game not during the crisis but immediately after it, the content of the game can provide a safe space for them.” (Expert 2)

Reinforcement Mechanism (n=4)

Four experts expressed that rewarding the child with visual reinforcers such as confetti, badges, or stars at the end of the game can increase the likelihood of repeating correct behaviors. These types of symbolic rewards have a positive effect on motivation.

“Visual symbols work very well in directing children’s emotional responses. The sticker system used in classrooms applies here as well. To reinforce the child’s sense of achievement, extra rewards can be given as they progress through levels. The feeling of winning can be strengthened.” (Expert 4)

Adaptability of Game Levels (n=5)

Five experts emphasized that since ASD diagnosis includes individual differences, the game should be playable at different difficulty levels. Selecting a level suitable to the child’s developmental level before starting can make the experience more efficient and safer.

“You cannot give the same game to a child with mild ASD and one with severe ASD. Level progression or content selection according to the level is critical. I liked that the game offers level selection at the start. The guide can choose difficulty levels based on the child’s prior knowledge and approach to the game, or the child can continue from where they left off with an ID if the game is paused.” (Expert 1)

Balanced Use of Sensory Stimuli (n=3)

Three experts appreciated that the visuals and sounds in the game were selected to avoid triggering children’s sensory sensitivities. It was stated that excessive brightness, sudden noises, or complex backgrounds should not be used.

“Sensory sensitivity is very common in ASD. It is important for visuals to be simple, clear, and calming. The game is designed to attract children’s attention in this way. Also, the music can be turned on and off, which is suitable for taking precautions when children are overly stimulated.” (Expert 3)

Guided Play and Digital Screen Control (n=4)

Four experts noted that a guided play experience can help protect children from uncontrolled screen time. Providing adult guidance or system-driven prompts during gameplay creates a safer experience for the child.

“Parents complain a lot about screen time. A guided mode is a big advantage here. The system can automatically limit screen time and shut down after a set period, or when played under adult supervision, using a timer to show screen time can eliminate risky situations for children.” (Expert 5)

“Some children lose track of time while playing. The game should close after a certain time or have a timer. I find it beneficial to have such an option in this game. Even if the child plays alone, it prevents uncontrolled screen use.” (Expert 1)

Recommendations for Game Revision

Supporting Game Levels with Buttons and Visuals (n=3)

Three experts recommended that levels should be supported not only by written descriptions but also by symbols and visuals to enhance children’s comprehension. This will make it easier for children to select levels.

“Expressing levels not only with text but also with symbols and icons helps children understand more easily. Visual support is important.” (Expert 4)

Consistency of Sounds – Using the Same Sound in Similar Situations (n=3)

Experts emphasized that the game should provide the same sound feedback for recurring situations so that children can understand the guidance more clearly.

“If there is a warning sound, it should be heard the same way every time. Otherwise, the child may get confused. For example, providing a single reinforcement for a negative situation can reduce confusion, and you can give this with a consistent phrase such as ‘try again’.” (Expert 1)

Use of Lively, Colorful, Animated, and Lighted Design Elements (n=4)

Four experts suggested that the game should be presented with more lively, dynamic visuals, especially enriched with robot characters, to increase the attention of children with autism.

“Robot characters and lighted moving objects attract children’s attention a lot. A visually more striking design should be preferred. Some of your visuals seemed a bit dull; I hope

replacing them with brighter colors will be beneficial. Also, familiar cartoon characters as visuals can help children connect more with the game.” (Expert 1)

Evaluation of the Game During Playthrough via Scoring (n=3)

Experts recommended that children should be rewarded for making correct choices, and that this feedback should be reflected through indicators such as scores.

“After the child makes correct choices, collecting points both motivates and shows progress. You have stages progressing, but a progress bar or visible scores are needed. If this deficiency is addressed, I believe it will provide greater benefit.” (Expert 1)

Feedback Mechanism to Report Game Errors to Developers (n=2)

Two experts stated that there should be a mechanism allowing easy reporting of technical or content issues to developers during gameplay.

“If there is a problem in the game, it would be good to have a button that parents or teachers can use to easily report it. I experienced some errors at certain stages and could not exit the game. I think this step is important for us to know if there is a technical issue.” (Expert 5)

Providing a Sense of Progress with Left-to-Right Visual Transitions (n=3)

Experts pointed out that showing the game’s progress visually with left-to-right transitions will help children mentally feel structured progress.

“If transitions between levels go from left to right, the child can see that they are ‘advancing’ and better grasp the game structure.” (Expert 2)

Longer Display Time for Transition Visuals Between Levels (n=3)

Experts noted that the insufficient duration of transition scenes might make it difficult for children to perceive them and recommended showing these visuals for a longer time.

“If visuals pass too quickly, the child may miss them without understanding. Transition screens should stay a bit longer. Currently, there are quite fast transitions in the game, but to better comprehend them, either allowing scene transitions by button or having visuals stay longer would be beneficial.” (Expert 3)

3. Results

In order to provide solution support for the difficulties experienced by children with autism spectrum disorder in emotion recognition and interpretation, first of all, a literature review was conducted. The effectiveness of games, play therapy, and computer-assisted solutions has been observed. As a result of the researches carried out in this sense, and in terms of the title in which the solution will be presented, a game has been started to be developed that will embody the study and provide support and training in emotion recognition. The game, which has been developed, provides gradually increasing support and training for children with autism spectrum disorder to recognize and make sense of emotions from facial expressions.

The main motivation in the game design is to be as simple as possible and not distract children with autism spectrum disorder, while improving the educational stages and to support children. According to expert opinions, when designing digital games for children with autism, it is important to incorporate calming and regulatory content, properly structure reinforcement systems, and allow game levels to be selected according to individual differences. Attention should also be paid to presenting sensory stimuli in a balanced manner and monitoring screen time through guided modes. These findings provide fundamental principles on how digital games should be structured for therapeutic, educational, and behavioral development purposes.

According to experts, the necessary revisions in the game include the implementation of a level selection system supported by buttons and symbols, which would enhance comprehensibility for early childhood and cognitively limited individuals. Sensory sensitivities to sound and light are frequently observed in children with autism. Therefore, it is important that sounds can be muted and that lighted elements are used cautiously. The game's progression and feedback mechanisms provide children with a sense of achievement while also allowing teachers or parents to monitor progress. Uncontrolled screen time may lead to risks such as game addiction and attention difficulties; hence, time limitations and an automatic game shutdown function would be practical. The findings of this study align with the existing literature, where experts also recognize the significant benefits of game-based computer technologies as therapeutic and educational tools for individuals with Autism Spectrum Disorder (Durkin, 2010; Grynszpan et al., 2014).

The game developed in this study is designed with the needs of individuals with Autism Spectrum Disorder (ASD) in mind and comprehensively addresses all the design principles recommended in the literature. It features minimalist visual and audio design to prevent sensory overload and offers adjustable sensory inputs such as sound levels, color contrast, and animation speed. Social interactions are presented in a step-by-step and guided manner, while feedback mechanisms are clear, understandable, and supportive of learning. The game provides a predictable structure, helping users feel secure, with progress indicators and short, clear task descriptions that ease the learning process. The step-by-step tutorial structure, positive reinforcement, softened negative feedback, and repetitive tasks support skill development. Moreover, the game offers customizable elements based on the player's interests and needs, and its simple control mechanisms enhance accessibility. With scenarios that promote empathy and social awareness, the game also contributes to the emotional development of individuals with ASD as suggested in literature (Altinok & Arıcı, 2024).

Future Studies

- In future studies, it is recommended to conduct an experimental study with both children diagnosed with Autism Spectrum Disorder (ASD) and typically developing children of the same age group to examine the effectiveness of the mobile game in teaching emotional states.

- This study has shown the importance of level differentiation in the game. Future studies may develop game scenarios, difficulty levels, and differentiated content tailored to different levels of autism spectrum (mild, moderate, severe).
- In this study, expert opinions were collected. In future research, comprehensive user tests with children with autism from different age groups should be conducted to measure the effectiveness of the game, user experience, and level of interaction.
- Regarding sensory sensitivity, the effects of visual and auditory stimuli on attention, calming, and sensory overload processes in children with autism can be investigated using neuroscientific methods (e.g., EEG, eye-tracking technologies).
- Adaptive game mechanisms that automatically adjust according to the child's in-game behaviors may enhance the learning process. In this context, future studies can focus on AI-based personalization.
- The long-term effects of games on children's behavioral and cognitive development are still limited in knowledge. Therefore, longitudinal studies can be conducted to examine the impact of long-term (e.g., 3–6 months) game use on learning, emotion regulation, and acquisition of social skills.

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Smart Learning :Innovative Strategies for foreign Learning Teaching

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1. Introduction

Smart learning represents a major shift in education by integrating advanced technologies such as artificial intelligence, cloud computing, and big data analytics into the learning process. It moves beyond traditional teaching methods by creating environments that adapt to individual learners' needs, interests, and progress. Through personalized content delivery, real-time feedback, and interactive platforms, smart learning enhances student engagement, fosters deeper understanding, and supports the development of critical thinking and problem-solving skills.

The Importance of Smart Learning

In education, smart learning encourages a more flexible, student-centered approach. It allows learners to access materials anytime and anywhere, promotes collaborative learning through digital platforms, and enables educators to track and adjust teaching strategies based on data-driven insights. By bridging the gap between traditional education and the digital world, smart learning better prepares students for the challenges of a rapidly changing, technology-driven society.

1.1. Personalized Learning Paths

Smart learning technologies adapt to individual students' language levels, learning styles, and progress, offering tailored content that helps them master skills more effectively.

1.2. Interactive and Engaging Methods

Through tools like language apps, virtual classrooms, and AI-powered feedback, smart learning makes language practice more interactive, motivating students and improving retention.

1.3. Real-Time Assessment and Feedback

Smart learning provides immediate evaluation of language skills (speaking, writing, reading, listening), allowing learners to quickly identify mistakes and improve continuously.

2. Mobile assisted Language Learning MALL

Mobile-Assisted Language Learning (MALL) refers to the use of mobile devices such as smartphones, tablets, and other portable technologies to support and enhance the process of learning a language. With the flexibility and convenience that mobile technology offers, learners can access educational content anytime and anywhere, breaking the limitations of traditional classroom settings. MALL makes use of apps, podcasts, videos, games, and online dictionaries to create more engaging and interactive language learning experiences.

One of the key strengths of MALL is its ability to support personalized and self-directed learning. Learners can choose materials that match their interests and proficiency levels, set their own pace, and practice specific skills like listening, speaking, reading, and writing. Mobile technologies also encourage informal learning, allowing users to incorporate language practice into their daily routines. Features like instant feedback, voice recognition, and interactive quizzes help learners monitor their progress and stay motivated.

Moreover, MALL fosters collaborative learning by enabling communication and interaction among learners through messaging apps, discussion forums, and virtual classrooms. It also opens opportunities for authentic language use, such as participating in real-time conversations with native speakers or engaging with culturally relevant content. As mobile technologies continue to evolve, MALL is becoming an essential tool for language education, promoting greater accessibility, flexibility, and engagement for learners around the world.

3. Virtual reality and Language Learning

Virtual reality (VR) and immersive learning are gaining traction in education, offering students an engaging and interactive way to experience and understand complex concepts. In VR, users are immersed in a 3D environment that can simulate real-world scenarios or entirely imaginary worlds. This can enhance experiential learning by allowing students to engage in simulations, explore historical events, or practice skills in a risk-free setting.

The benefits of VR and immersive learning include:

Enhanced engagement: VR can hold students' attention more effectively than traditional methods, making learning more enjoyable.

Experiential learning: Students can "experience" historical events, scientific concepts, or even foreign languages in a way that textbooks or videos cannot replicate.

Increased retention: Active participation in learning through VR is shown to improve memory retention compared to passive learning.

Accessibility: VR can make certain experiences, such as visiting distant places or historical periods, accessible to all students regardless of location or ability.

In higher education, VR is particularly useful for fields like medicine, engineering, architecture, and history, where practical experience or visualization of abstract concepts is crucial.

Challenges and remedies

1. Technological Barriers

Solution: Use adaptive learning platforms and mobile-friendly resources.

2. Engagement and Motivation

Solution: Incorporate gamification and interactive tools like language exchange programs.

3. Limited Access to Resources

Solution: Use Open Educational Resources (OER) and collaborate with tech companies.

4. Digital Literacy and Accessibility

Solution: Offer digital literacy training and use mobile-accessible platforms.

5. Teacher Resistance and Lack of Expertise

Solution: Provide professional development programs and encourage teacher collaboration.

4. Conclusion

Smart learning offers exciting opportunities to transform foreign language teaching at universities by incorporating technology and innovative methods. It allows for personalized learning experiences, increased student engagement, and more efficient language acquisition. However, universities face challenges such as technological barriers, limited access to resources, and the need to balance new tools with traditional teaching methods. These hurdles require creative solutions to ensure that technology enhances rather than hinders the learning process.

To overcome these challenges, solutions like mobile-friendly learning platforms, gamification, and open educational resources (OER) can help bridge the gap. Mobile-based tools can make learning more accessible to students, regardless of their technical resources, while gamification encourages engagement and motivation. Moreover, collaborating with technology companies and using OER ensures that institutions can provide a broad range of high-quality resources without the need for significant investment.

Ultimately, addressing issues of digital literacy and teacher resistance is key to the successful implementation of smart learning strategies. Providing faculty with professional development and offering digital literacy training for students ensures that everyone can benefit from these technological advancements. By adopting these strategies, universities can create dynamic and inclusive language learning environments that cater to diverse student needs and prepare them for the globalized world.

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Digital School Culture from the Perspective of School Administrators: Transformation, Resistance, and Strategic Approaches

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Abstract

Digitalization in educational environments is not merely a process of technological integration; it also represents a multidimensional transformation that influences pedagogical approaches, management practices, and organizational values. The diversification of learning environments, the changing profiles of learners, and the transition of educational processes to digital platforms have necessitated the strategic development of digital competencies among teachers, students, and educational administrators. In this context, digital school culture pertains not only to the ability of institutions to utilize technology, but also to how, for what purpose, and in accordance with which values technology is employed. School administrators play a critical role in the success of the digital transformation process. They are positioned as strategic decision-makers, implementers, and leaders who integrate digital values into institutional culture and facilitate the internalization of digital culture within schools. As in any transformation process, it is inevitable to encounter various forms of resistance at both individual and organizational levels during digitalization. Managing these resistance factors is essential for the effective adoption and sustainability of digital culture. Accordingly, this study aims to explore school administrators' perceptions of digital school culture, the individual and organizational resistance factors encountered during the digital transformation process, and the strategic approaches they adopt to overcome these challenges. The study was designed using the phenomenological patterns, one of the qualitative research methods. The study group consisted of 12 school administrators selected through maximum variation sampling. The data were collected using a semi-structured interview form and analyzed through content analysis. The findings revealed that school administrators attributed individual resistance primarily to a lack of digital literacy and anxiety toward change, while organizational resistance was linked to insufficient institutional support and a lack of motivation. As a result, it was concluded that school administrators play an active role in not only managing technological integration but also embedding digital culture as an integral part of the school environment.

Keywords: *Digitalization, Digital Transformation, Digital School Culture, School Administrators, Organizational Resistance*

1. Introduction

It is increasingly recognized that school culture is a critical factor in the digital transformation process (Firican, 2023). The impact of digitalization on education requires not only the use of technological tools but also a fundamental transformation in school culture, teaching processes, and leadership approaches. In this context, school principals play key roles in managing educational transformation and are developing leadership skills to respond to changing needs (Navaridas-Nalda et al., 2020). The role of school administrators has evolved from traditional curriculum leadership to a leadership approach that effectively manages technology and strategically plans digital processes. This transformation has made them key actors in digital development in schools (Gulpan & Baja, 2020; Dexter et al., 2016; Stuart et al., 2009). The meaningful and effective use of technology in education is not limited to the integration of digital tools; it also entails fundamental changes in teaching strategies, learning environments, and school culture (Fullan & Langworthy, 2014). Indeed, this change necessitates the restructuring of the curriculum and teaching-learning culture to adapt to the future workforce and social structure (Ruloff & Petko, 2021). In this context, digital transformation necessitates change not only in strategy, technology, and processes but also in organizational structures and cultural fabric. At the heart of this transformation lies the human factor; the active participation of individuals in the process plays a decisive role in the success of the transformation (Clarke, 2018).

It has been observed that digitalization in schools has created a change that includes digital modules, online and blended learning applications, and advanced decision-making processes. This situation also brings about transformation in the context of school culture. This is because digitalization necessitates the formation of a new cultural structure motivated by both people and technology (Purnomo et al., 2024). In this transformation process, school leaders are expected not only to use technology but also to shape a strategic vision that prioritizes school culture, participation, and success (Aksal, 2015). The combination of digital culture and scientific and digital competencies contributes to the development of many high-level skills, from creative thinking to problem solving, conscious decision-making, and linking scientific reasoning to daily life. Digital school culture supports educators' and students' active participation in technology, their adaptation to change, their collaboration, and their generation of innovative ideas (Litina & Rubene, 2024). The shaping of this culture and the successful integration of digital technologies into education are directly related to effective school leadership (Lindqvist & Pettersson, 2019; Litina & Rubene, 2024). Digital transformation in education aims to restructure people, data, and processes and, at the same time, prepare for the uncertainties of the future (McCarthy et al., 2023). At this point, the pedagogical, technical, administrative, and organizational challenges faced by school leaders reveal the complex nature of digitalization, which is reflected at all levels of school organization (Håkansson-Lindqvist & Pettersson, 2019). This is because digital transformation is not limited to technological integration; it also involves the redesign of pedagogical approaches and administrative processes to suit the needs of students and teachers (Bartholomew Joseph et al., 2024).

Today, many schools are actively trying to participate in digitalization processes and are facing various challenges in this process (Håkansson-Lindqvist & Pettersson, 2019). The

rapidly evolving technological environment has made how schools respond to this change a critical research topic (Brzyskiewicz et al., 2025). At this point, school administrators leading the digital transformation process are responsible for dealing with dynamics such as uncertainty, rapid change, and resistance (Willermark et al., 2023). In this context, digital leadership reflects an ethical, agile, trust-based, and collaboration-oriented mindset (Tigre et al., 2022). School digital leaders must address multifaceted and complex challenges in line with the digital transformation agenda (Brzyskiewicz et al., 2025). The experiences of school administrators in digital transformation processes, the resistance they encounter, and the strategies they develop to overcome this resistance are of great importance for the formation and sustainability of digital school culture. Equipping educators with the necessary knowledge and skills to use digital tools effectively and supporting them with continuous professional development directly affects the success of digital culture (Joseph & Uzundu, 2024; Veckalne & Tambovceva, 2022).

In this context, school administrators' perceptions of digital school culture, the types of individual and organizational resistance they encounter during the digital transformation process, and the strategic approaches they develop to overcome this resistance are emerging as an important area of research. This study aims to examine in depth school administrators' perceptions of digital school culture, the individual and organizational resistance factors encountered during the transformation process, and the strategic approaches they have adopted to overcome these resistances. The following sub-objectives have been identified in line with this aim:

- 1. To reveal school administrators' perceptions of digital culture,*
- 2. To reveal how the digitization process began in schools and the roles of school administrators in this process,*
- 3. To reveal practices aimed at increasing the digital literacy of teachers and students,*
- 4. To reveal the types of resistance encountered at the individual level during the digital transformation process,*
- 5. To identify the strategies school administrators use to address resistance encountered at the individual level during the digital transformation process,*
- 6. To identify the leadership qualities school administrators should possess during the digital transformation process.*

2. Method

Research Design

The study was designed using a phenomenological approach, one of the qualitative research methodologies. Phenomenology aims to deeply understand individuals' lived experiences, the meanings they assign to these experiences, and their subjective interpretations regarding a particular phenomenon (Creswell & Poth, 2018). Within this context, the study focused on the phenomenon of digital school culture, aiming to reveal school administrators' experiences, perceptions, and encountered resistances during the digitalization process.

Study Group

The study group consisted of 12 school administrators working in various provinces across Turkey. Table 1 provides information about the school administrators who participated in the study.

Table 1. Demographic Characteristics of the Participants

Participant Code	Gender	School Type	Management Experience (Years)	Geographical Location	Technological Infrastructure
P1	Male	Primary School	5	Central	Adequate
P2	Male	Secondary School	12	Central	Adequate
P3	Female	High School	8	Central	Adequate
P4	Male	Primary School	15	Central	Adequate
P5	Male	Secondary School	10	Central	Adequate
P6	Male	High School	20	Central	Adequate
P7	Male	Primary School	6	Central	Adequate
P8	Male	Secondary School	11	Central	Adequate
P9	Female	High School	9	Central	Adequate
P10	Male	Primary School	18	Central	Adequate
P11	Male	Secondary School	7	Central	Adequate
P12	Female	High School	14	Central	Adequate

Of the 12 school administrators listed in Table 1, 9 (75%) are male and 3 (25%) are female. All participants work in schools located in central regions. The technological infrastructure of the schools was assessed as adequate by the participants. Regarding the types of schools where they serve, the participants work at primary, secondary, and high school levels. Their management experience ranges from 5 to 20 years, encompassing administrators with varying levels of experience.

Participants were selected using maximum variation sampling, a purposive sampling technique commonly employed in qualitative research. This method aimed to capture diverse experiences, perspectives, and contextual conditions related to the digital transformation process. Participants were selected to ensure diversity in terms of gender, school type (primary, secondary, high school), and years of professional experience. In line with ethical principles, the personal information of participants was kept confidential, and during the interviews, administrators were coded as “P” (participant) followed by numbers corresponding to the interview sequence (P1, P2, ..., P12).

Data Collection and Analysis

Data were collected through a semi-structured interview form developed by the researchers. To ensure content validity, expert opinions were obtained regarding the interview questions.

Following expert review, a six-question interview form was finalized and used as the data collection instrument. Interviews were conducted individually, either online or face-to-face, with school administrators who consented to participate. Each interview lasted approximately 21 minutes on average, and audio recordings were made with participants' permission. The recordings were transcribed by the researchers and prepared for analysis.

Content analysis was employed to analyze the data. In this process, researchers repeatedly read the responses related to each question, created codes, grouped similar codes into categories, and then derived themes from these categories. To ensure inter-rater reliability, coding was performed independently by three researchers. According to the formula proposed by Miles and Huberman (1994), inter-coder reliability was calculated at 91%. Direct quotations from participants were included to support the findings.

3. Findings

The school administrators were asked the question, “Do you think a digital culture has formed in your school? What indicators reflect this situation?” and the findings obtained are presented below.

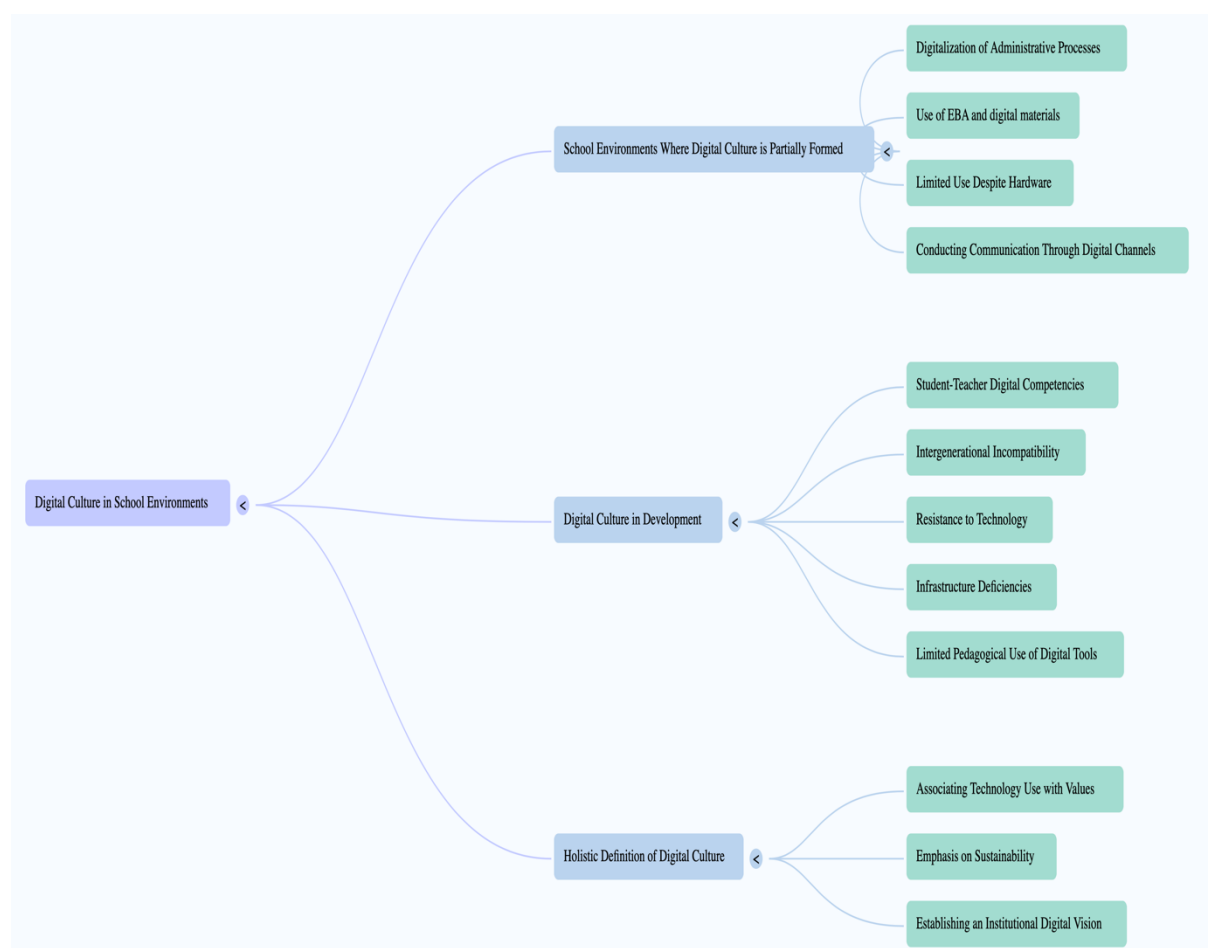


Figure 1. *Categories and Codes Related to Perceptions of Digital Culture*

As shown in Figure 1, the perceptions of school administrators regarding digital culture are grouped under three main categories. The first category, "School Environments Where Digital Culture is Partially Formed," reflects participants' views indicating that digital culture is present at a limited level in schools. Codes under this category include *"Digitalization of Administrative Processes," "Use of EBA and Digital Materials," "Limited Use Despite Hardware,"* and *"Conducting Communication Through Digital Channels."* Within this scope, participants noted that digital applications are predominantly utilized in administrative operations and basic communication processes, while integration into instructional activities remains limited.

The second category, "Digital Culture in Development," encompasses opinions expressing that digital culture is in the formation phase but this process is hindered by certain obstacles. Prominent codes in this category are *"Student-Teacher Digital Competencies," "Intergenerational Incompatibility," "Resistance to Technology," "Infrastructure Deficiencies,"* and *"Limited Pedagogical Use of Digital Tools."* These findings indicate that individual competency differences, generational conflicts, technical infrastructure problems, and pedagogical adaptation deficiencies play significant roles in the digitalization process.

The third category, "Holistic Definition of Digital Culture," includes the views of administrators who believe that digital culture should evolve into a structure integrated with the school's vision and values, rather than being reduced merely to technology use. The codes emerging under this perspective are *"Associating Technology Use with Values," "Emphasis on Sustainability,"* and *"Establishing an Institutional Digital Vision."* According to this approach, building a sustainable digital culture requires not only technical competencies but also a strategic institutional orientation and a value-based digital understanding.

Below are selected example statements from school administrators related to this theme:

"Yes, I can say it has largely formed. Teachers now instantly enter grades and absences into the system. Even in communication with parents, digital platforms are preferred." (P1)

"Digital culture hasn't fully settled yet. Some of our teachers are still hesitant about technology. However, the number of teachers who regularly use EBA and prepare their own digital materials has increased." (P2)

"Frankly, digital culture is still in the development phase. Students are more ready than us, but it takes time for teachers to adapt. There are even those who use digital whiteboards only to open presentations." (P3)

"According to my school, digital culture is limited to the use of technological tools. The real issue is how effectively these tools are used pedagogically." (P4)

"In my opinion, digital culture is formed not only by teachers but also by supporting the entire operation of the school with digital systems. We have taken good steps in this regard, but sustainability is important." (P5)

"As school administration, we support digitalization, but not all teachers approach it with the same enthusiasm. Nevertheless, we have made significant progress compared to last year." (P6)

The school administrators were asked the question, “How did the digitalization process begin in your school? What was your role in this process?” and the findings obtained are presented below.

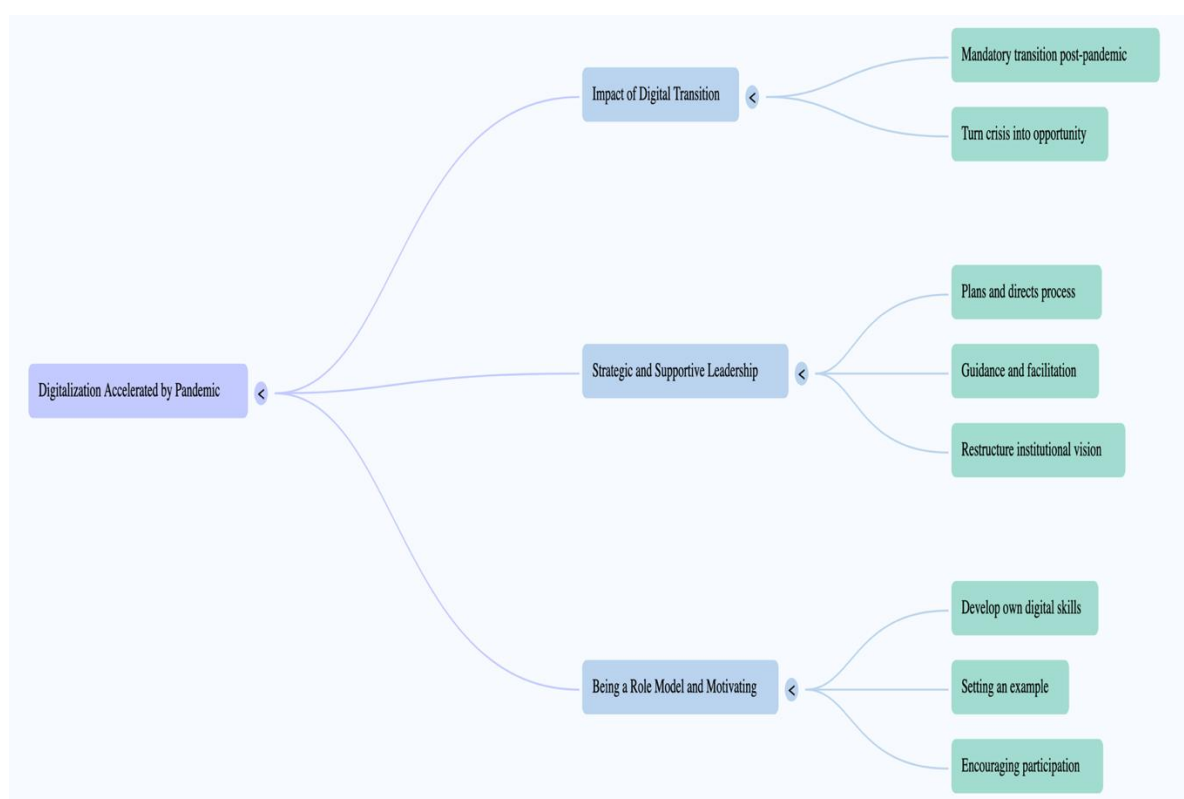


Figure 2. *Categories and Codes Related to the Theme “Digitalization Accelerated by the Pandemic”*

According to Figure 2, the views of school administrators regarding the digitalization accelerated by the pandemic are grouped under three main categories.

The first category, "Impact of Digital Transition," indicates that digital transformation became a necessity in the post-pandemic period and that some school administrators adopted an approach to turn this process into an opportunity. Prominent codes under this category include “*Mandatory transition post-pandemic*” and “*Turn crisis into opportunity*.” Administrators stated that the pandemic was not only an obligation but also a process that accelerated digital change and encouraged new practices.

The second category, "Strategic and Supportive Leadership," reflects that school administrators acted as actors who plan, guide, and support the process. Key codes in this category are “*Plans and directs process*,” “*Guidance and facilitation*,” and “*Restructure institutional vision*.” Findings grouped under this category demonstrate that school administrators contribute to the digital transformation process not only as implementers but also as strategic leaders developing vision.

The third category, "Being a Role Model and Motivating," reveals that school administrators take on leadership roles that are not only supportive but also exemplary, motivating, and encouraging participation in the process. Codes such as “*Develop own digital skills*,” “*Setting*

an example,” and “Encouraging participation” stand out. It is observed that administrators improve their own digital competencies, set examples for teachers, and actively engage in the transformation process.

Below are some selected example statements from school administrators related to this theme:

"The pandemic accelerated this process, but we had already taken some steps before that. As the school principal, I organized the initial training sessions."(P1)

"Digitalization started with the students' interest first. They knew some applications before the teachers did. I tried to be a guide in this process."(P4)

"We started with a project initiated by the District Directorate of National Education. I had a facilitating role in the process; I tried to motivate the teachers."(P7)

"There was a lot of resistance at the beginning. As the assistant principal, I tried to set an example by preparing and sharing digital content to encourage the teachers."(P9)

"We established a digital transformation team under my leadership. We planned the process step by step. We continuously collected feedback and monitored the progress."(P11)

"I was newly appointed at that time. I had to both learn the system and involve the teachers in the process. It was a rather challenging but instructive period."(P12)

The school administrators were asked the question, “What kind of practices did you implement to improve the digital competencies of teachers and students?” and the findings obtained are presented below.

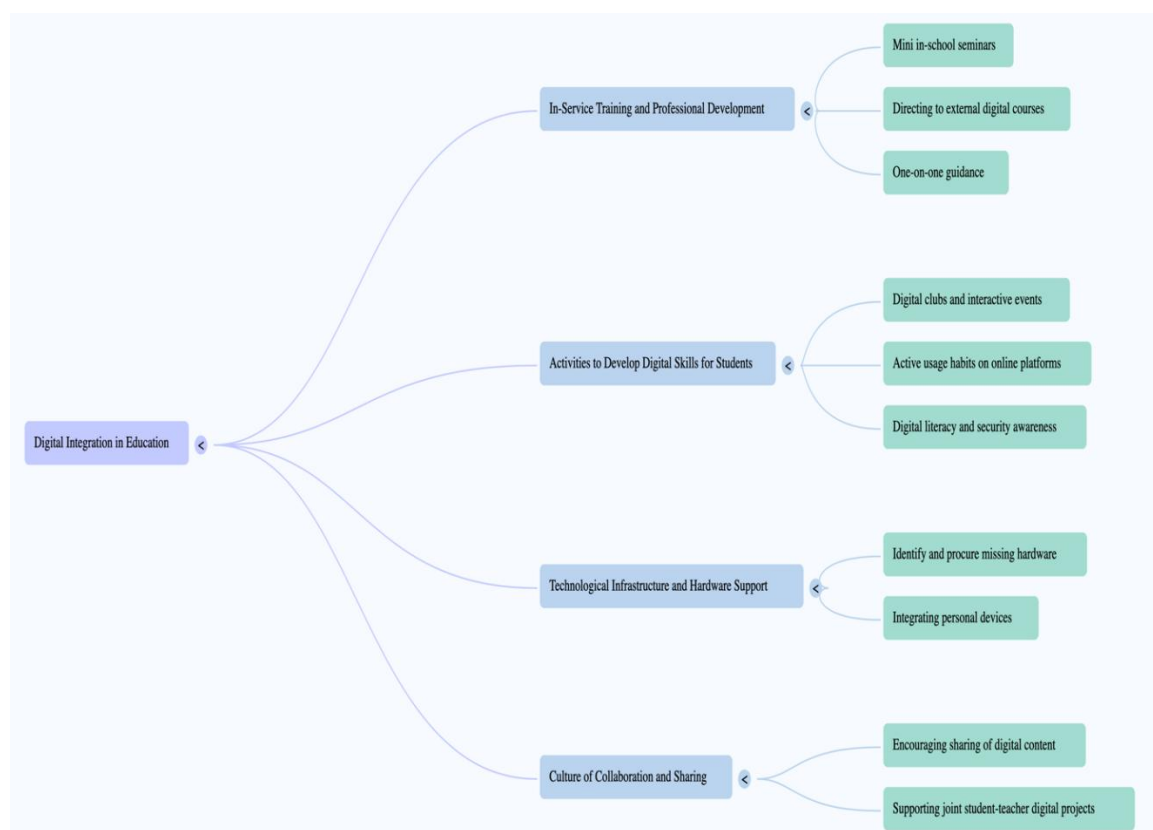


Figure 3. Categories and Codes Related to the Theme “Digital Integration in Education”

According to Figure 3, the views of school administrators regarding the digital integration into educational processes are grouped under four categories: "In-Service Training and Professional Development," "Activities to Develop Digital Skills for Students," "Technological Infrastructure and Hardware Support," and "Culture of Collaboration and Sharing." These categories encompass practices aimed at enhancing the digital competencies of teachers and students, infrastructure support, and a culture of collaboration.

The first category, "In-Service Training and Professional Development," includes in-service training programs designed to improve teachers' digital competencies. School administrators reported that practices such as *"Mini in-school seminars," "Directing to external digital courses,"* and *"One-on-one guidance"* are employed to support individual teacher development. This finding indicates that school-based professional development serves as a crucial leverage point in the digitalization process.

The second category, "Activities to Develop Digital Skills for Students," covers school initiatives aimed at enhancing students' digital skills. Prominent practices in this category include *"Digital clubs and interactive events," "Active usage habits on online platforms,"* and *"Digital literacy and security awareness."* Administrators emphasized not only encouraging students to use technology but also fostering conscious individuals with awareness of digital security.

The third category, "Technological Infrastructure and Hardware Support," focuses on the physical conditions supporting digital integration in schools. School administrators highlighted strategies such as *"Identify and procure missing hardware"* and *"Integrating personal devices"* to address hardware deficiencies. These findings illustrate that digital transformation is shaped not only by pedagogical factors but also by infrastructural conditions.

The final category, "Culture of Collaboration and Sharing," reflects a culture in schools where digital content creation and sharing are encouraged. Under codes such as *"Encouraging sharing of digital content"* and *"Supporting joint student-teacher digital projects,"* it is observed that learning communities engaging in collaborative digital production are developing. This finding suggests that school culture is evolving into a more collaborative and collective structure alongside digitalization.

Below are some selected example statements from school administrators related to this theme:

"We participated in in-service training, but we also held internal sharing meetings. Experienced teachers provided hands-on support to others." (P1)

"We organized robotics and coding workshops for students. For teachers, we do a digital tool introduction every month."(P3)

"We brought in experts from outside the province on educational technologies. Participation was very high. Teachers immediately reflected what they learned in the classroom."(P9)

"We started shooting lecture videos. We created a digital archive for both teachers and students."(P10)

"We developed content that could be used on interactive whiteboards. Some teachers even started their own YouTube channels." (P11)

The school administrators were asked the question, “How would you define the types of resistance shown by teachers or staff at an individual level during the digital transformation process?” and the findings obtained are presented below.

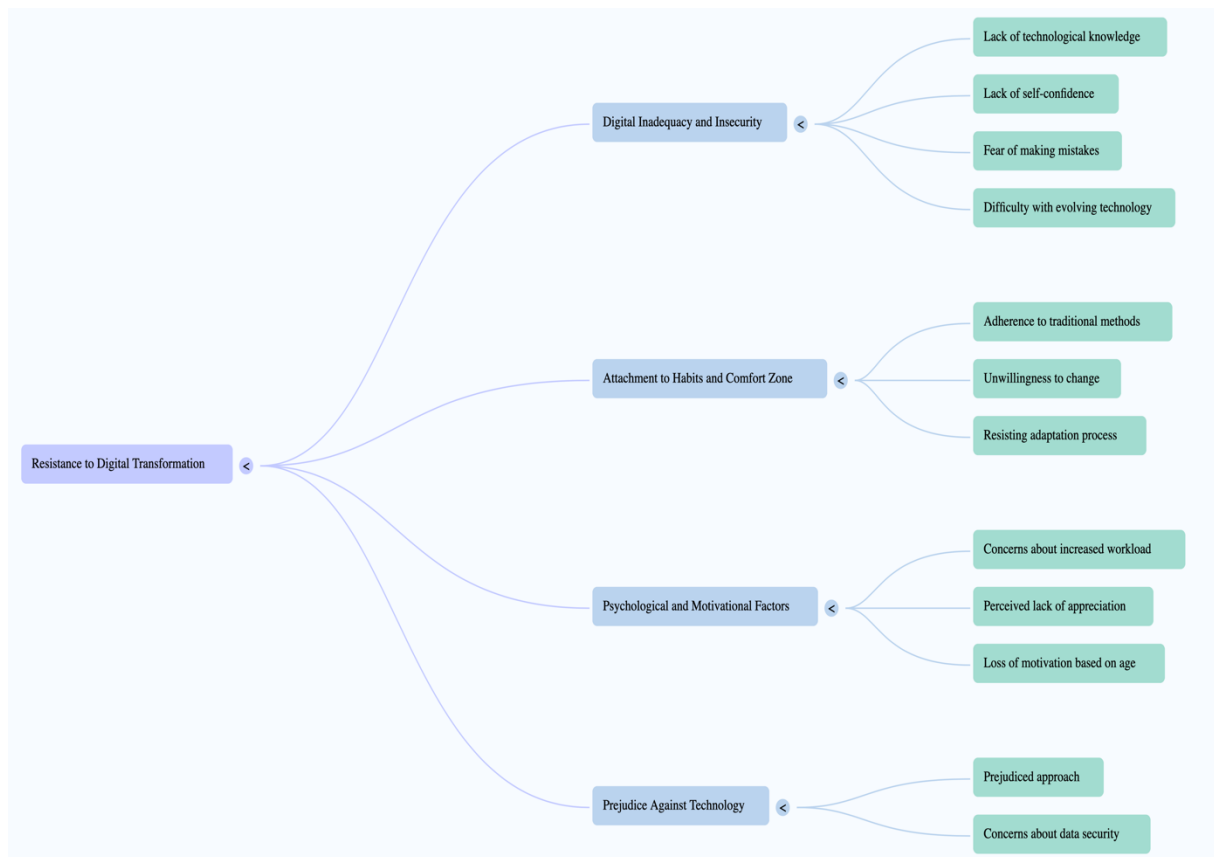


Figure 4. *Categories and Codes Related to the Theme “Resistance to Digital Transformation”*

According to Figure 4, the school administrators’ views on resistance to digital transformation are grouped under four main categories: "Digital Inadequacy and Insecurity," "Attachment to Habits and Comfort Zone," "Psychological and Motivational Factors," and "Prejudice Against Technology." These categories reveal the multidimensional nature of resistance, ranging from individual competency deficiencies to psychological factors and prejudices against technology.

The first category, "Digital Inadequacy and Insecurity," includes individual sources of resistance such as insufficient technological skills or lack of confidence in digital environments. Under codes like “*Lack of technological knowledge*,” “*Lack of self-confidence*,” “*Fear of making mistakes*,” and “*Difficulty with evolving technology*,” administrators noted that especially among teachers above a certain age, reluctance towards digital environments, fear of errors, and challenges in keeping up with technological changes are prevalent.

The second category, "Attachment to Habits and Comfort Zone," covers resistance based on adherence to traditional methods and unwillingness to change. Codes such as "*Adherence to traditional methods*," "*Unwillingness to change*," and "*Resisting adaptation process*" indicate that digital transformation challenges pedagogical habits, which often results in resistance.

The third category, "Psychological and Motivational Factors," involves reasons related to teachers' emotional states and motivation levels. Administrators expressed that teachers experience concerns about increased workload, lack of appreciation, and age-related motivation loss, represented under codes like "*Concerns about increased workload*," "*Perceived lack of appreciation*," and "*Loss of motivation based on age*."

The final category, "Prejudice Against Technology," encompasses general distrust or negative attitudes towards technology. Codes such as "*Prejudiced approach*" and "*Concerns about data security*" illustrate that some teachers adopt cautious and critical stances toward technology, particularly regarding data security issues.

Below are selected example statements from school administrators related to this theme:

"The most common resistance I see is the 'I can't deal with technology' excuse. It's a bit age-related, but the main reason is the comfort zone." (P3)

"Some are not against technology, but they are afraid of making mistakes. They are hesitant to be embarrassed in front of students."(P4)

"Not finding time is also a reason for resistance. Teachers are very busy, willing to learn something new, but there is a lack of motivation."(P7)

"Some see digitalization as just a trend. There are those who say, 'I've been teaching like this for years, there's no need to change.'"(P8)

"The constant change of new systems creates confusion. This also leads to alienation from the process."(P9)

"Resistance is sometimes passive. That is, they don't openly oppose it, but they also don't get involved in the process. This slows down the transformation."(P12)

The school administrators were asked the question, "How did you deal with the resistance you encountered during the digital transformation process? What strategies did you use?" and the findings obtained are presented below.

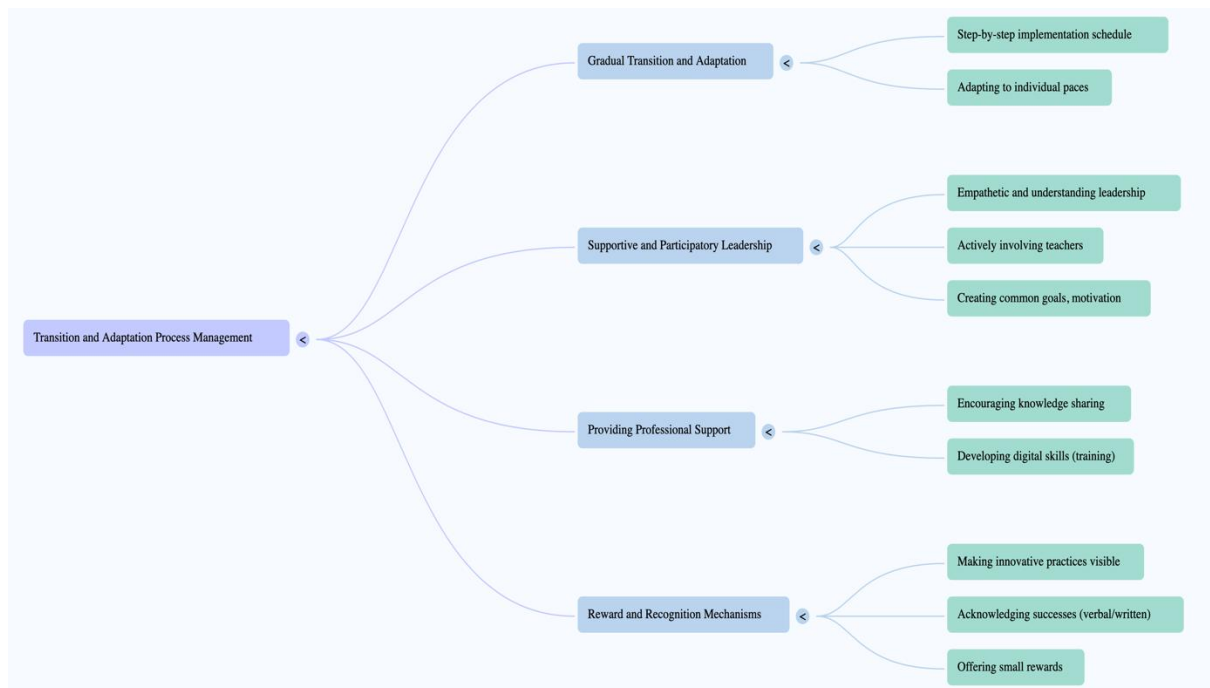


Figure 5. *Categories and Codes Related to the Theme Transition and Adaptation Process Management*

According to Figure 5, the views of school administrators regarding strategies developed to effectively manage the transition and adaptation during the digital transformation process are grouped under four main categories: "Gradual Transition and Adaptation," "Supportive and Participatory Leadership," "Providing Professional Support," and "Reward and Recognition Mechanisms." These findings indicate that digitalization is not merely a technical process but a change process that requires careful management.

The first category, "Gradual Transition and Adaptation," emphasizes the importance of progressing the digital transformation step-by-step while considering individual differences among teachers. Under codes such as "*Step-by-step implementation schedule*" and "*Adapting to individual paces*," administrators noted that extending the process over time is necessary to ensure healthier adaptation by teachers.

The second category, "Supportive and Participatory Leadership," encompasses the empathetic leadership approach adopted by school administrators and their efforts to involve teachers in the process. Key codes here include "*Empathetic and understanding leadership*," "*Actively involving teachers*," and "*Creating common goals, motivation*." Administrators stated that they set shared objectives to increase teacher motivation and foster internalization of the process.

The third category, "Providing Professional Support," includes support mechanisms aimed at enhancing teachers' digital skills. Codes such as "*Encouraging knowledge sharing*" and "*Developing digital skills (training)*" reveal that professional development-focused digital training sessions are organized in schools and experienced teachers are encouraged to share knowledge.

The final category, "Reward and Recognition Mechanisms," covers strategies for making digital practices visible, acknowledging teachers' successes, and encouraging participation through small rewards. Codes under this category include "*Making innovative practices visible*," "*Acknowledging successes (verbal/written)*," and "*Offering small rewards*." School administrators emphasized that such recognition mechanisms promote teacher engagement and innovative approaches.

Below are selected example statements from school administrators related to this theme:

"I preferred to support rather than persuade. I had one-on-one meetings, and we set small goals." (P2)

"We made successful examples visible. We tried to motivate resistant teachers with these examples."(P5)

"We provided training but also gave moral support. We supported them by celebrating even small successes."(P6)

"We talked about benefits, not obligations. We didn't expect everyone to learn at the same pace."(P9)

"We didn't directly hold resistant teachers responsible, but we involved them in the process. The division of roles worked."(P10)

"I assigned some teachers as mentors. Resistance decreased through them." (P11)

The school administrators were asked the question, "In your opinion, what kind of leadership should school administrators exhibit in digital transformation?" and the findings obtained are presented below.

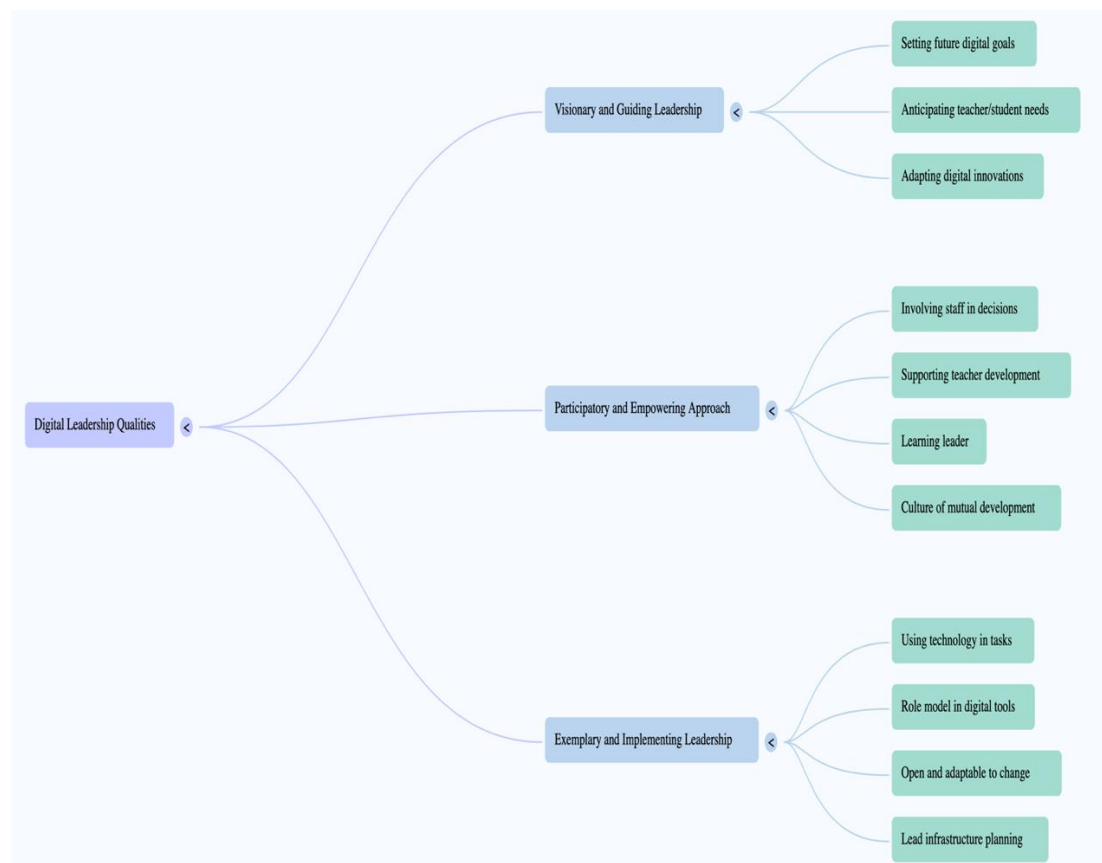


Figure 6. *Categories and Codes Related to the Theme Digital Leadership Qualities*

According to Figure 6, the perceptions of school administrators regarding the necessary qualities for effective digital leadership are grouped under three main categories: "Visionary and Guiding Leadership," "Participatory and Empowering Approach," and "Exemplary and Implementing Leadership." These categories reveal that during the digital transformation process, administrators take on not only directive roles but also inclusive, supportive, and implementing roles.

The first category, "Visionary and Guiding Leadership," encompasses a strategic outlook on the future of digital transformation and innovative orientations. School administrators stated that they undertake leadership roles such as "*Setting future digital goals*," "*Anticipating teacher/student needs*," and "*Adapting digital innovations*" by defining digital objectives, anticipating the needs of teachers and students, and integrating innovative technologies into the institutional culture.

The second category, "Participatory and Empowering Approach," reflects an inclusive leadership style that ensures active participation of teachers in the digital transformation process and supports their professional development. Prominent codes here include "*Involving staff in decisions*," "*Supporting teacher development*," "*Learning leader*," and "*Culture of mutual development*." Administrators emphasized that involving teachers in decision-making, fostering collective learning, and building development collaboratively are fundamental elements of digital leadership.

The third category, "Exemplary and Implementing Leadership," relates to school administrators serving as role models by personally using digital tools and leading the implementation of the transformation. Codes such as "*Using technology in tasks*," "*Role model in digital tools*," "*Open and adaptable to change*," and "*Lead infrastructure planning*" are included in this category. Administrators indicated that by directly using digital tools in their duties, adopting an open attitude toward change, and taking active responsibility in infrastructure planning, they set examples for teachers and lead the process effectively.

Below are some selected example statements from school administrators related to this theme:

"They should be participatory and supportive. The command-and-control method doesn't work in this process."(P1)

"The leader should be an example. If their own digital skills are weak, their expectations from the team will not be credible."(P4)

"They should be visionary. They should think not only about today but also about 3 years from now."(P5)

"They should empathize. They should try to understand the resistance, not just act with performance expectations."(P7)

"A leadership approach that is open to change and eager to learn is needed."(P8)

"The leader's most important task is to prepare the environment. They must create a safe, learning-oriented climate for digital transformation."(P11)

4. Conclusion

This study comprehensively examined school administrators' perceptions of digital school culture, digital transformation processes, and digital leadership roles through qualitative data. The findings indicate that digitalization in educational settings is multidimensional, dynamic, and context-dependent. This multidimensional structure reveals that digitization is not merely a technological renewal, but also involves pedagogical, institutional, and cultural transformations (Pettersson, 2018). It was observed that digital culture manifests at varying levels within schools; in some institutions, it remains limited to administrative processes and The school's level of digital maturity, the leader's vision, and teachers' attitudes toward technology are among the determining factors in the formation of these differences (Dexter, 2011). Moreover, a minority of school administrators defined digital culture through a more holistic approach that integrates sustainability, values, and institutional vision. Such a holistic approach highlights the importance of integrating technology with the school's mission in the context of sustainable digital leadership (Schrum & Levin, 2013). With the acceleration of digitalization during the pandemic, it emerged that school administrators assumed strategic, supportive, and role-model leadership roles. The COVID-19 process has highlighted leaders' crisis management, empathetic communication, and flexible technology integration skills (Trust & Whalen, 2020). It was observed that inclusive transition plans, which consider individual differences among teachers and proceed step-by-step, were adopted during the digital transformation process. Digital integration was understood not merely as a technical transformation but also as a process achieved through teacher training, development of student skills, provision of infrastructure support, and cultivation of a culture of collaboration.

The research findings revealed that resistance encountered during the digital transformation process stems not only from a lack of technological knowledge but also from multidimensional factors such as attachment to habits, loss of motivation, psychological factors, and prejudices against technology. The most common reasons for teachers' resistance to technology include fear of uncertainty and past negative experiences (Kimmons, 2015). It was found that school administrators can effectively manage this resistance by demonstrating empathetic leadership, providing professional support, recognizing achievements, and motivating through small rewards. Additionally, administrators were found to assume not only managerial but also visionary, participatory, and implementing digital leadership roles in a holistic manner. Digital leadership includes not only the ability of managers to use technology but also the responsibility to prepare the organization for the future (Anderson & Dexter, 2005).

Based on these findings, several recommendations can be proposed. Firstly, in-service training programs focusing on strategic planning, technology integration, and change management should be organized to enhance school administrators' digital leadership skills. Identification of resistance factors during digital transformation and development of individualized intervention strategies to address these resistances are necessary. School-based in-service training applications aimed at improving teachers' digital competencies should be expanded; furthermore, digital clubs, online safety activities, and interactive applications that enhance students' digital literacy levels can be encouraged. For successful digital transformation, transitions should be planned, gradual, and adapted to the individual pace of

teachers. Making innovative practices visible during the process, acknowledging successes verbally or in writing, and increasing motivation through small rewards can strengthen teacher participation. Finally, to ensure the sustainability of digital transformation not only at the individual but also at the institutional level, a culture of collaboration and collective learning should be supported, and digital projects based on teacher-student collaboration can be incorporated.

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An Analysis of Pre-Service FL Teachers' Perceptions of AI Competence Self-Efficacy

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Abstract

Artificial intelligence (AI) has a revolutionary impact on foreign language (FL) education. It facilitates decision-making on critical components of FL teaching (e.g.: planning, materials selection/design and assessment etc.). Serving a wide range of functions such as a tutor, a collaborator and an empowering tool, AI helps to better tailor teaching/learning practices in a way to yield maximum benefit in a flexible environment. Considering the overwhelmingly positive arguments about the effectiveness of AI, it is of crucial importance to probe into FL teachers' perceptions about their own knowledge and skills to make effective use of AI applications in FL classrooms. To this end, the present study investigated pre-service FL teachers' AI competence self-efficacy perceptions. Using a mixed-methods design, the study collected both quantitative and qualitative data. The results revealed that though they were all digital natives, pre-service FL teachers expressed interesting perceptions about their AI competence self-efficacy. The study implied that AI integration should be designed in the light of insider views as a top-down imposition based on hearsay might prove counterproductive.

Keywords: *artificial intelligence; self-efficacy; pre-service; perceptions; foreign language*

1. Introduction

Technological developments have drastically revised foreign language (FL) learning/teaching environments in the last few decades. In particular, the integration of artificial intelligence (AI) serves several functions to make FL education more accessible and sustainable. For instance, AI can act as a tutor and collaborator to help students learn/practice the target language in a seamless space. It also fosters personalized teaching by offering enriched content and organization. Given the overwhelmingly favorable attitudes and enhanced motivation towards AI use, it is no surprise that FL teachers are required to make AI-informed decisions about critical components of FL teaching (e.g.: planning, materials selection/design and assessment etc.). Yet, FL teachers' AI competence to effectively make such decisions is questionable as the current literature on AI integration mostly elaborates on theoretical aspects of AI use at the expense of identifying teachers' needs and providing them with relevant pre-/in-service training. Accordingly, the present study intends to investigate pre-service FL teachers' perceptions of self-efficacy about their AI competence. The study probed into the following questions:

Q-1- What are pre-service FL teachers' perceptions of self-efficacy about their AI competence?

Q-2- What are perceived benefits of using AI in FL learning/teaching?

Q-3- What are perceived drawbacks of using AI in FL learning/teaching?

2. Literature Review

Teacher AI competence is a critical concept which refers to teachers' ability to create and sustain a secure, effective and ethical AI-oriented learning environment (Chiu, 2024; Falloon, 2020; UNESCO, 2024). It is based on teachers' AI proficiency, their competence to employ AI for educational instructional purposes along with fostering students' AI use, and their involvement in relevant professional development (Falloon, 2020; UNESCO, 2024). Based on the key principles of safeguarding teachers' rights, fostering human agency and promoting sustainable development, UNESCO (2024) developed the AI competency framework for teachers, which outlined teachers' AI competence across five aspects including Human-centred mindset, Ethics of AI, AI foundations and applications, AI pedagogy, and AI for professional learning. Forming 15 competencies in total, the framework further categorized these competencies across three progression levels i.e. Acquire, Deepen, and Create. In line with these competencies in the AI competency framework for teachers, Chiu, Ahmad, & Çoban (2024) proposed six dimensions of teacher AI competence: namely, AI knowledge (AIK), AI pedagogy (AIP), AI assessment (AIA), AI ethics (AIE), human-centered education (HCE), and professional development (PEN).

AIK refers to teachers' recognition of the potential of AI-based tools in maximizing efficiency and productivity along with a thorough understanding of fundamental principles and applications of AI. AIP specifies teachers' capacity to carefully select AI tools that yield an engaging and interactive classroom environment by enhancing instructional practices and enriching the content and learning experiences. AIA delineates the integration of AI-based tools to promote assessment for learning. Chiu et al. (2024) argued that AIA was of particular importance as it was not explicitly addressed in previous conceptions of AI competence. HCE emphasizes the capacity for critical consideration of AI integration in the light of human values and ethical issues such as privacy concerns and AI-related biases. Finally, PEN centers on teachers' commitment to sustain their professional development via AI-based tools and promote a proper understanding of AI integration for effective learning and teaching.

Though the literature about teachers' AI competence is in its early infancy, the need for teachers to safely and effectively integrate AI tools into educational settings has been well-established (Falloon, 2020). Several studies yielded favorable results about the integration of AI into educational settings, in particular FL classrooms. Examining AI-assisted teaching in inclusive and diverse K-12 education, Xia et al. (2022) indicated that AI ensured higher motivation and engagement for students in various disciplines. Furthermore, AI-human interactions through chatbots offered timely feedback, which was valuable for supplementing students' continuous learning process (Fu, Gu, & Yang, 2020). More importantly, AI surfaced as an ideal platform to foster personalized learning and provide targeted interventions (Dai et al., 2020). AI use was also instrumental in test generation and automated scoring (Attali et al., 2022; O'Sullivan, Breakspear, & Bayliss, 2023).

With specific reference to foreign language learning, Al-Kadi and Ali (2024) demonstrated that AI fostered more effective, motivating, and holistic learning experiences. Likewise, AI-integration positively contributed to the development of FL speaking (Junaidi, Hamuddin, Julita, Rahman, & Derin, 2020). Ma's (2021) study in a college English-immersive context evinced that AI tools fostered better performance in FL listening. Furthermore, AI integration in the form of online grammar checker enhanced writing skills for English-major students (Vo & Nguyen, 2021). Nonetheless, AI cannot be considered as a replacement for human teachers as there will evidently be a need for human decision-making, organization and planning (UNESCO, 2024; Vo, & Nguyen, 2021).

3. Methodology

3.1. Design

The present study used mixed-methods design as it employed both quantitative and qualitative instruments. The study was designed as a descriptive, explanatory study (Creswell, 2003). It intended to investigate pre-service FL teachers' AI competence self-efficacy perceptions in the light of the need for AI integration into their prospective classrooms. Participation in the study was voluntary as possible participants were ensured of true anonymity. Moreover, possible participants were informed in advance that they could withdraw from the study at any time and their responses would be used for research purposes only.

3.2. Participants

The present study used convenience sampling (Cohen, Manion & Morrison, 2007) to invite participants. Informed through social media and personal contacts, a total of 54 EFL pre-service teachers consented to participate in the study. There were 20 males and 34 females, whose age ranged between 20-32. The participants all were senior students enrolled in English Language Teaching programs of two different universities in Türkiye. The participants had completed most of the methodology courses offered in their program and were weekly teaching in practicum schools.

3.3. Instruments

The study used both qualitative and quantitative tools to collect information. The Teacher AI Competence Self-Efficacy (TAICS) scale (Chiu et al., 2024) was employed to collect pre-service FL teachers' perceptions of AI competence self-efficacy. The TAICS scale comprises 24 Likert-type items anchored from 1 (strongly disagree) to 5 (strongly agree). The TAICS scale measures teachers' AI competence self-efficacy. It encompasses six dimensions including AIK, AIP, AIA, AIE, HCE, and PEN. Chiu et al. (2024) reported that the TAICS scale was internally consistent with Cronbach's alpha values >0.87 for all the six dimensions. Similarly, the present study found high internal consistency as the Cronbach's alpha for the overall TAICS was 0.92 (Table 1). Moreover, the study used a structured form to collect qualitative data about FL teachers' perceptions of AI competence self-efficacy. Developed by the researcher, the structured form included three open-ended items. The items essentially probed into the participants' views about possible advantages and disadvantages of AI use in FL learning along with their use of AI tools.

Table 1. *Reliability analysis for the TAICS overall*

Cronbach's Alpha	Cronbach's Alpha based on standardized items	N of items
,920	,921	24

3.4. Data Analysis

The study used a mixed-methods approach to analyze the data obtained from the participants. For quantitative data, the present study used descriptive statistics via a statistical program used for social studies. The quantitative analyses helped to reveal means and standard deviations along with maximum and minimum values for the overall TAICS and each dimension. As to the qualitative data, the participants' responses to the structured form were analyzed through content analysis. An iterative process of preliminary coding followed by focused coding (Charmaz, 2006) was used to ensure a deep understanding of the participants' perceptions of AI competence self-efficacy. While the preliminary coding enabled tentative identification of possible codes and keywords, the focused-coding process yielded themes and categories for a refined representation of the data. Furthermore, the results of the qualitative analysis were sent to the participants so that they could member-check (Patton, 2002) before finalizing the analyses.

4. Findings

The present study delved into pre-service FL teachers' comprehension of AI, their attempts to learn AI, and ability of using AI for learning/teaching purposes. The study employed descriptive analysis to measure pre-service FL teachers' AI competence self-efficacy. The results revealed that the participants had a moderate level self-efficacy about their AI competence as the mean score of their responses on overall TAICS scale was found to be 3,82 (Table 2). As to the participants' perceptions about the six dimensions of the TAICS scale, the study found similar results. More specifically, the participants reported a moderate level of self-efficacy regarding their knowledge of AI as their mean score on AIK was 3,89. Emphasizing teachers' use of AI for educational purposes, the participants' self-efficacy about pedagogy in AI environments was also moderate as their AIP score was found to be 3,85. Likewise, the participants expressed moderate levels of efficacy about using AI for assessment purposes given that their mean score on AIA was 3,76. The study indicated that the participants had moderate levels of understanding and applying AI use under ethical considerations as their mean AIE score on the TAICS featured to be 3,86. In addition, the pre-service FL teachers in this study had moderate self-efficacy regarding their capacity to nurture values and attitudinal orientations towards human-AI interactions as their mean HCE score was identified to be 3,88. Finally, the participants scored moderately with respect to their efficacy to develop professionally via AI because their mean score on PEN was 3,67.

Table 2. *Descriptive analysis of the dimensions of the TAICS*

	<i>f</i>	<i>Min.</i>	<i>Max.</i>	<i>X</i>	<i>Sd.</i>
AIK	54	1,75	5,00	3,89	,61
AIP	54	1,75	5,00	3,85	,57
AIA	54	1,75	5,00	3,76	,61
AIE	54	2,25	5,00	3,86	,59

HCE	54	1,75	5,00	3,88	,68
PEN	54	2,00	5,00	3,67	,72
TAICS	54	2,83	5,00	3,82	,47

As to the results of the content analysis, the present study highlighted that more the one third of the participants (N=19, Figure 1) unequivocally stated that they had not used any AI tools for FL learning/teaching. However, the study identified a large diversity of tools among those who reported using AI for FL learning/teaching. The study pointed out that ChatGPT was by far the most commonly used AI tool because almost one third of the participants (N=16) reported using ChatGPT for FL learning/teaching. Nevertheless, the other AI tools stated by the participants had few users. To illustrate, only 4 participants referred to Gemini as the AI tool they used for FL learning/teaching. Similarly, 3 participants were found to use Deepseek for FL learning/teaching while the number of participants using Duolingo, Grammarly and Monica were found to be only 2 for each. Some other programs used by one participant only were grouped with the title “Others”, which included Gliglish, Ai-tutor, Say Hi, Hello Talk, Memorise, Magic School, Praktika, Buddy AI, OpenAI and Quillbot.

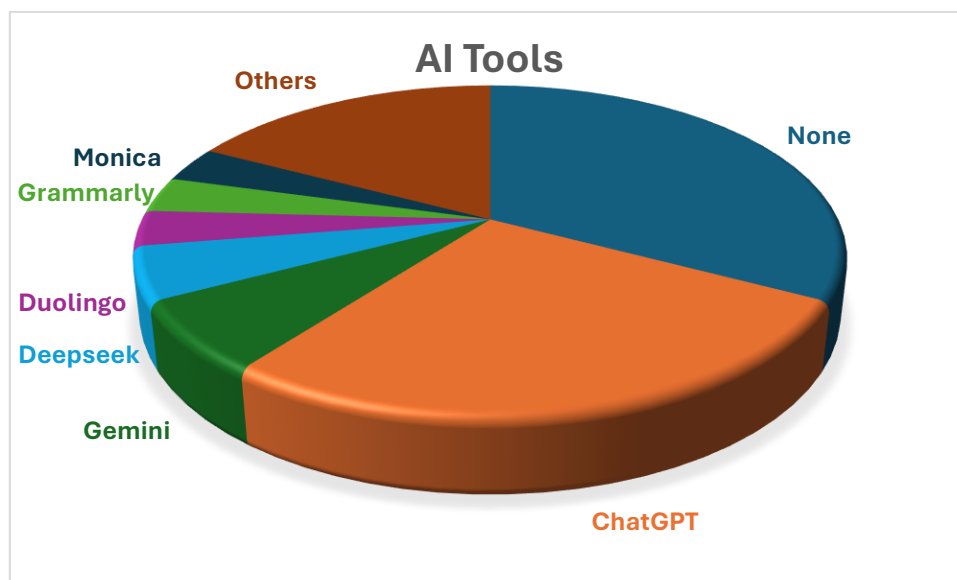


Figure 1. *AI tools used by the participants*

As for the pre-service FL teachers' perceptions about the benefits of using AI in FL learning/teaching, the present study provided an extended list of contributions that AI tools could make to learning/teaching English (Figure 2). Almost one third of the participants (N=15) pointed out that the use of AI in FL education promoted creativity in both materials and ideas. The participants argued that AI tools “can help us generate or get inspiration to create materials” (Participant 4). Another participant underlined that “When combined with human ideas, AI helps us to come up with more different and creative ideas” (Participant 16). 20% of the participants indicated that the use of AI was also influential on saving time and thus, better managing the time as “AI tools save time, and facilitate the teaching process” (Participant 42). Moreover, the present study demonstrated that AI promoted independent learning by “helping students become autonomous and find information easily” (Participant

9). 8 participants in the study attributed sound role to AI tools for helping students learn grammatical rules because using AI “makes it easier to learn grammar rules” (Participant 16). An equal number of participants claimed that the use of AI would facilitate teaching in various ways including “7/24 accessibility, adaptive testing, and cost-effective solutions” (Participant 24). In the same vein, the study unearthed that the use of AI was instrumental in FL education as it would “diversify the resources for learning/teaching language and increase engagement of students” (Participant 3). Moreover, 6 participants clarified that a major benefit of AI use in FL learning/teaching was associated with practicality because AI tools not only “are easy to use” (Participant 52) but also “make things easier for teachers” (Participant 19). Similarly, 6 participants introduced some benefits for students in that AI would foster learning in several ways like “providing a lot of practice such as in pronunciation, reading and listening, which make learning more efficient” (Participant 46). Moreover, 5 participants underlined that AI would offer an individualized learning experience by “helping students to learn in their own pace” (Participant 6) and “designing the lessons according to students’ learning styles” (Participant 25). A smaller number of participants proposed that the use of AI would promote FL education by offering immediate feedback because students “don’t need to wait for the teacher and instantly get feedback about their mistakes” (Participant 17). Finally, 3 participants coined benefits of AI use particularly for FL vocabulary since AI offered “enriched content for better memorizing new vocabulary” (Participant 2).

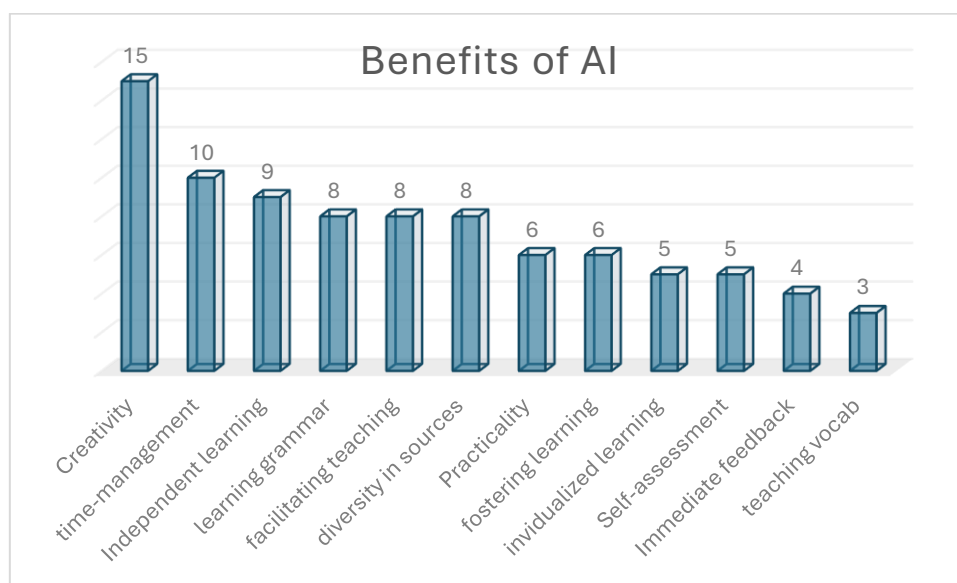


Figure 2. *Benefits of AI use in FL learning/teaching*

Eventually, the present study yielded intriguing findings regarding possible drawbacks of AI use in FL learning/teaching. The results showed that AI-addiction was the predominant drawback associated with using AI in FL education (Figure 3). Almost one third of the participants asserted that “students and teachers alike could get addicted to AI use and, it has a negative impact on their critical thinking and problem-solving abilities” (Participant 14). A similarly large number of participants warned about the risk of getting decontextualized and/or inappropriate information in their AI-based queries. Put it simply, the participants posited that “not all the information we get from AI is correct. We must be careful and check it” (Participant 1). Mentioned by 7 participants, though, personal privacy issues surfaced to be

equally important. One of the participants explicitly pinpointed the risk associated with privacy issues by noting that “these tools are not completely safe, therefore it is dangerous to rely solely on them” (Participant 8). Moreover, the study indicated that plagiarism was another serious drawback that needs to be considered in AI use. The participants complained that as a consequence of AI use, “students may not use their own thoughts when doing tasks and get people used to using ready-made AI-generated ideas” (Participant 43). Nevertheless, the present study found that technical issues and cheating/assessment safety were referred to by only one participant each despite the perceived importance of ensuring proper maintenance of the digital devices and reliable assessment.

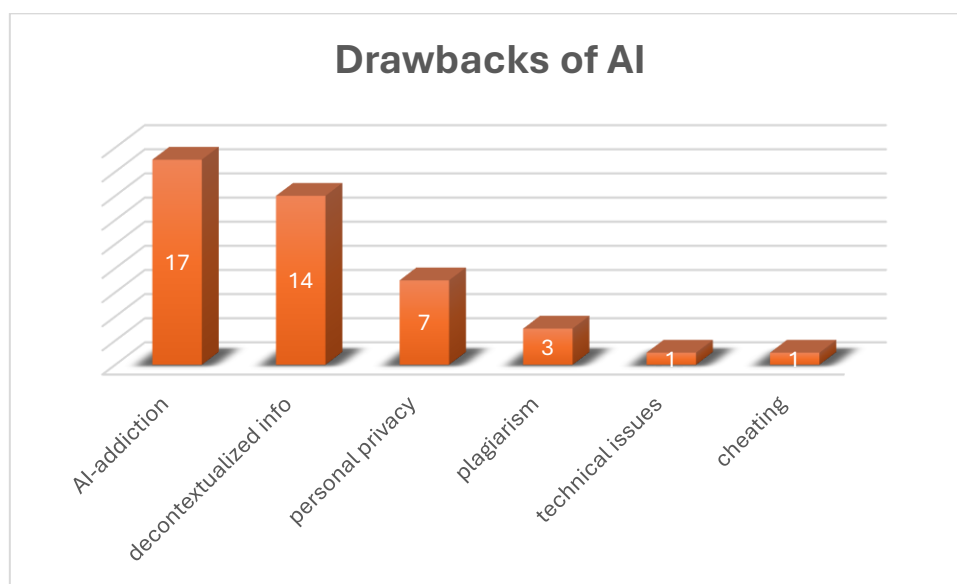


Figure 3. *Drawbacks of AI use in FL learning/teaching*

5. Discussion and Conclusion

The present study yielded intriguing results about FL teachers’ perceptions of their AI competence self-efficacy. Given that a large number of participants reported no prior use of AI tools, the study emphasized that it was essential to provide teachers with comprehensive training about AI use in FL learning/teaching. For pre-service teachers, higher education institutions could offer this training in the form of a course, in which FL teacher candidates would gain awareness and hands-on experiences about using various AI tools for FL education. Likewise, in-service teachers could be required to join workshops, conferences, and webinars to get updated and keep pace with the developments in AI use. While AI integration is still in its infancy, such training should be systematic and pay heed to teachers’ voice in content and design in order to promote an effective transition to AI-based FL learning/teaching (Kitcharoen, Howimanporn, & Cookaew, 2024). Moreover, the study surprisingly found moderate levels of AI competence self-efficacy among those pre-service teachers who were all digital natives. This finding echoed the call for a great awareness about possible opportunities and difficulties of digital education (European Commission’s Digital Education Action Plan, 2020).

In the light of the benefits reported by the participants, the present study underlined that creative use of AI should be encouraged for learning and practicing different aspects of the target language including grammar, vocabulary and 4 skills development. Tümen-Akyıldız (2024) similarly posited that while it complemented FL learning/teaching, AI integration should not compromise creativity. Creative use of AI could also help to avoid an over-reliance on AI as the present study pinpointed that FL teachers and students alike faced the risk of getting lazy and addicted to AI due to overuse of AI. Convergent with this finding, Du (2025) purported that mindful use of AI which favored functional efficiency would prevent teachers' habitual over-reliance on AI. Furthermore, this study highlighted that AI integration fostered individualized and autonomous learning along with enriched content and resources. Considering the recent surge of language learning autonomy coupled with the extensive use of AI tools (Azhar & Abdullah, 2024), the study clarified that innovative uses of AI should be a priority for FL teachers so that various resources would attract diverse student interests while the content would primarily be organized according to students' different learning styles.

Nevertheless, the present study cautioned that personal privacy issues were a critical point to consider for a safe and efficient integration of AI in FL education. Projecting a tripartite analysis of privacy-based risks in AI use, Selvam and Vallejo (2025) proposed that AI-based language tools exposed privacy issues due to insufficient security measures. Therefore, incorporating an ethical AI framework with a sound data protection facility could enhance trust and security of the users (Selvam, & Vallejo, 2025). Equally important, the present study hinted on safety issues in AI-based assessment. While AI tools like ChatGPT could significantly contribute to FL assessment through innovative questions and immediate feedback for revising students' performance (Chiu, 2024; Fu et al., 2020), teachers should pay due attention to the risk of cheating in the tasks or exams that they would assign in FL classrooms.

Finally, the findings in this study confirmed that it was impossible for AI to replace human interaction and thinking in FL education (UNESCO, 2024). No matter how developed AI tools could be, the study cautioned that AI users should necessarily check the information provided by AI because this information might be outdated, irrelevant or decontextualized. Based on the participants' concerns about the possibility of getting incorrect or inappropriate answers to their AI-oriented queries, the study suggested that AI tools should be perceived as a complement, rather than a replacement, to human intelligence (Selvam, & Vallejo, 2025)

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Novice English Teachers' perceptions on the Benefits and Challenges of AI Tools in Foreign Language Learning

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Abstract

This study investigates novice English language teachers' perceptions of the benefits and challenges of integrating Artificial Intelligence (AI) tools into English as a Foreign Language (EFL) classrooms. AI technologies, including intelligent tutoring systems, chatbots, and adaptive learning platforms, offer innovative approaches to improving grammar, vocabulary, reading, and speaking skills. Despite these advantages, concerns such as over-reliance on technology, ethical dilemmas, and data privacy issues remain significant challenges. While existing research primarily focuses on experienced teachers, the perspectives of novice teachers—who are still developing their professional identities—are underexplored. This mixed-methods study addresses this gap by collecting data from 50 novice teachers via questionnaires and 10 participants through semi-structured interviews. Quantitative data were analyzed using descriptive statistics, while qualitative data were thematically analyzed following Braun and Clarke's (2006) six-step approach. Findings indicate that novice teachers perceive AI tools as beneficial for enhancing academic performance ($M=3.98$), problem-solving skills ($M=3.92$), and independent learning. Key benefits include improving education quality ($M=4.06$) and facilitating accurate feedback ($M=3.94$). However, challenges such as insufficient training ($M=4.50$), ethical concerns ($M=4.14$), and fears of over-reliance on AI ($M=4.04$) were also identified. Participants emphasized the need for professional training, clear ethical guidelines, and maintaining human interaction in teaching. These findings highlight the importance of balanced AI integration, offering valuable insights for teacher training programs and institutional policies to ensure effective and responsible use of AI in EFL classrooms.

Keywords: *Novice English language teachers, artificial intelligence tools, EFL education, AI benefits and challenges*

1. Introduction

The rapid emergence of artificial intelligence (AI) in recent years has brought about transformative changes across various sectors, including health, industry, and education. In the realm of education, its influence is particularly evident in English language teaching, where AI is reshaping traditional methods and challenging their effectiveness. AI, defined as the ability of machines or computer systems to mimic human intelligence through tasks such as reasoning, learning, and problem-solving (Arjun & Panesar, 2020), has introduced new possibilities for innovative and adaptive learning experiences. Firdaus and Nawaz (2024) further describe AI as

the integration of machine capabilities that emulate human decision-making processes, enabling efficient data processing and informed actions. This remarkable development has rendered the control of (AI) tools an almost impossible task. Since this innovation blends digital learning materials with classroom education, it has the potential to facilitate both instruction and knowledge acquisition (Firdaus and Nawaz ,2024).

The integration of AI tools in English language learning has highlighted the limitations of traditional approaches, which often rely heavily on textbooks, lectures, and repetitive exercises. These conventional methods may fail to engage learners effectively, leading to decreased motivation and interest in language acquisition (Songsienchai, Sereerat, & Watananimitgul, 2023). In contrast, AI tools, with their ability to combine digital learning resources with classroom instruction, provide opportunities to enhance both teaching and learning outcomes. By leveraging AI technologies, educators can foster improved grammar accuracy, vocabulary development, reading comprehension, and fluency in writing and speaking among learners (Fattah, Vadivel, Shaban, & Shanmugam, 2023).

However, while AI offers numerous advantages, its implementation also presents significant challenges. Concerns related to data privacy, ethical issues, and the reliability of AI-generated content have sparked critical discussions among educators (Dincer & Bal, 2024). Additionally, the growing reliance on AI tools may inadvertently hinder students' creativity, critical thinking skills, and self-reliance. Issues such as plagiarism, reduced originality, and a potential dependency on technology further complicate its integration into language education (Yatri et al., 2023).

Statement of the Problem

The integration of artificial intelligence (AI) in English language teaching is revolutionizing traditional methods, offering innovative solutions to enhance language acquisition and learner engagement. AI tools such as intelligent tutoring systems, chatbots, and adaptive learning platforms have demonstrated their potential to personalize learning experiences, provide immediate feedback, and support skill development in learners (Arjun & Panesar, 2020; Fattah, Vadivel, Shaban, & Shanmugam, 2023). However, this rapid adoption also brings challenges, including ethical concerns, data privacy issues, and questions about the reliability and validity of AI-generated content (Dincer & Bal, 2024). Additionally, the growing reliance on AI tools may inadvertently lead to reduced creativity, critical thinking, and learner independence, as over-reliance on such technologies may encourage plagiarism and diminish problem-solving abilities (Yatri et al., 2023).

Despite the growing body of research on the effectiveness of AI in education, most studies have focused on the perceptions of experienced teachers or students. For example, existing literature highlights how experienced teachers integrate AI tools into their teaching strategies and the challenges they encounter (Firdaus & Nawaz, 2024). However, there is few research exploring how novice teachers—those who are still developing their teaching skills—perceive and interact with these tools. These early-career teachers face unique challenges, including adapting to evolving technologies while simultaneously building their professional identities. Their perceptions are crucial, as they can significantly influence the success or failure of AI

implementation in classrooms (Castañeda & Aguirre, 2018; Songsiengchai, Sereerat, & Watananimitgul, 2023).

Filling this research gap is crucial, as novice teachers are instrumental in shaping the future of English language education. Gaining insight into their perceptions on the advantages and challenges of AI tools can help teacher training and address their professional development needs. Without this understanding, teacher training programs may fall short, and the integration of AI tools in classrooms could miss the mark, leading to less effective implementation.

Significance of the Study

This study is significant for several reasons. First, it focuses on novice English teachers, a demographic that is underrepresented in existing research on AI in education. As teachers at the beginning of their careers, novice teachers are uniquely positioned to offer fresh perspectives on the integration of AI tools. Their experiences, challenges, and successes can provide actionable insights into how these tools can be effectively incorporated into teaching practices (Castañeda & Aguirre, 2018). By examining their perceptions, this study fills a critical gap in the literature and informs future research on technology-enhanced language learning.

Second, the findings of this study will contribute to the development of more targeted and effective teacher training programs. Novice teachers often face steep learning curves, particularly when adapting to new technologies. By identifying the specific barriers, they encounter—such as insufficient training, lack of access to resources, or concerns about ethical issues—this study can provide recommendations for equipping teachers with the skills and knowledge they need to succeed (Dincer & Bal, 2024; Yatri et al., 2023).

Lastly, the study contributes to the broader discourse on the role of technology in education. While AI tools have the potential to revolutionize English language teaching, they also pose risks if implemented without careful consideration. This research highlights both the opportunities and limitations of AI in language education, offering a balanced perceptions that can guide teachers and researchers in making informed decisions (Songsiengchai, Sereerat, & Watananimitgul, 2023).

While AI tools offer significant benefits, their integration into language classrooms comes with challenges. Educators have raised concerns about ethical issues, data privacy, and the potential for over-reliance on these tools, sparking important discussions in the field (Yuliani et al., 2024). The success of AI implementation also depends on factors such as teachers' familiarity with the technology and access to adequate training resources. Although many studies have examined the perceptions of experienced teachers and students, there is little research focusing on novice English language teachers. Having recently completed their training and entered the workforce, this group offers valuable insights into the practical use of AI in classrooms (Farrell, 2012). Their perceptions are particularly important as they face the dual challenge of mastering new technologies while building their teaching expertise. To address this gap, this study seeks to explore the benefits and challenges of AI tools from the perceptions of novice English language teachers.

2. Literature Review

The potential of artificial intelligence (AI) to enhance and support a multitude of scientific fields has been highlighted. These include health sciences, management, and education. It is evident that artificial intelligence applications constitute a significant feature of modern society (Ferdos, A., and Nawaz, S. 2024). Given the importance of education, particularly language learning, numerous studies have examined the efficacy of artificial intelligence in teaching and learning languages from diverse perspectives, including those of students and teachers. Considering this considerable advancement, each field has begun to address artificial intelligence and its benefits and challenges from its own perspective.

AI and Its Associated Tools in English Language Learning

Artificial intelligence (AI) in the context of English as a Foreign Language (EFL) refers to the capability of computers to perform tasks that typically require human intelligence, such as learning, problem-solving, and decision-making (Hazaymeh et al., 2024). AI has been defined as the capacity of a machine or computer system to emulate and execute tasks involving logical reasoning, learning, and problem-solving (Arjun & Panesar, 2020). These definitions underscore the transformative potential of AI in education, particularly in language learning.

AI-powered tools, such as language learning apps and interactive platforms, have become increasingly prevalent in English language education. These tools, designed using advanced algorithms, assist users with real-time translation, personalized tutoring, and feedback while generating original text in the target language (Rebolledo Font de la Vall & González Araya, 2023). The introduction of adaptive and interactive AI applications, such as writing and reading skill enhancers, has significantly altered traditional teaching methods by providing immediate feedback, thus boosting learners' engagement and performance (Font de la Vall & Araya, 2023).

AI in EFL; benefits and challenges

Research highlights numerous benefits of AI integration in EFL classrooms. For instance, Yuliani et al. (2024) identified that popular AI-supported applications, including Google Translate and ChatGPT, enhance students' writing skills, reading comprehension, and critical thinking while overcoming learning obstacles. Similarly, Sumakula et al. (2022) found that AI tools like Elsa and Masterpiece Generator facilitate students' understanding of grammar, writing techniques, and pronunciation.

Zhang (2024) emphasized that AI tools motivate students, engage them actively, and provide immediate and accurate feedback, particularly in speaking skill development. These findings align with studies showing that AI fosters personalized learning and improves classroom efficiency by optimizing time and enhancing lesson planning (Kalra, 2024). Additionally, Jamshed et al. (2024) reported that Saudi EFL learners appreciated AI's ability to provide

motivation and individualized support, resulting in improved language acquisition. Despite its benefits, the integration of AI tools into language education is not without challenges. One significant concern is the potential for over-reliance on AI applications, which may hinder critical thinking and promote passive learning habits (Yuliani et al., 2024). Zhang (2024) noted that while AI tools offer immediate assistance, they often lack contextual understanding and provide inaccurate or implausible information, which can mislead learners.

Moreover, issues such as ethical concerns, data privacy, and logistical limitations have been raised. For example, Jamshed et al. (2024) found that Saudi learners were concerned about privacy and the impact of AI on teacher-student relationships. Teachers, too, face challenges in effectively utilizing AI due to limited training opportunities and large class sizes, which restrict monitoring and personalized application (Firdaus & Nawaz, 2024). Similarly, Kalra (2024) highlighted the high costs of creating suitable learning environments as a barrier to AI adoption.

Related Studies

An increasing number of studies have examined the role of artificial intelligence (AI) in English language education, particularly in relation to teachers' perceptions, the advantages and challenges of AI tools, and their influence on student learning outcomes. Teachers are central to the successful integration of AI into classrooms, as their willingness to adopt these tools plays a critical role in unlocking their potential (Pörn et al., 2024). Resistance to using AI could hinder its broader application, while over-reliance on these technologies' risks limiting their benefits to certain groups, potentially deepening inequalities in education.

Studies examining teachers' perceptions of AI reveal both optimism and concerns. For instance, Al-Othman (2024) conducted a qualitative study at Muhammad ibn Saud Islamic University in Saudi Arabia, focusing on ethical concerns and prospects of AI in English as a Foreign Language (EFL) education. The study included 24 female English teachers and highlighted several positive aspects of AI, such as its ability to facilitate personalized learning, enhance interaction, and foster a supportive environment. However, the teachers also noted challenges, including a lack of spontaneity, overuse of AI tools, and reduced opportunities for human interaction. Similarly, Kalra (2024) investigated the use of AI tools among 208 Thai English teachers. The study found that AI applications, such as lesson planning tools and student feedback systems, helped optimize time, motivate students, and improve classroom management. Despite these benefits, participants expressed concerns about over-reliance on AI, which could impede critical thinking, and ethical challenges such as plagiarism.

Research on the challenges of AI integration has also focused on issues such as class size and teacher training. Firdaus and Nawaz (2024) reported that large class sizes limit the effective monitoring and utilization of AI tools, reducing their impact on student outcomes. Additionally, inadequate training for teachers in using AI was identified as a major barrier. Teachers in their study emphasized the need for professional development programs to address this gap and ensure effective AI integration.

The potential negative implications of AI, such as academic dishonesty and diminished critical thinking, have also been a key focus in the literature. Cong-Lemetal (2024) explored the perceptions of English teachers in Vietnam regarding academic cheating facilitated by AI tools

such as ChatGPT. Teachers expressed concern that students might use these tools to bypass intellectual effort, leading to plagiarism and a decline in genuine language proficiency. The study recommended raising awareness through training programs and adopting a balanced approach to AI use in classrooms.

Despite the extensive research on AI's impact in language education, most studies focus on experienced teachers or students, leaving the perceptions of novice English teachers underexplored. Farrell (2012) highlighted that novice teachers, having recently completed teacher training programs, bring unique insights and face distinct challenges in adopting new technologies. Their perceptions, shaped by their recent exposure to teacher training and early classroom experiences, may differ significantly from those of their experienced counterparts.

To address this gap, this mixed-methods study aims to explore the perceptions of novice English teachers regarding the benefits and challenges of AI tools in language learning. Specifically, it aims to answer the following research question:

What are the perceptions of novice English language teachers on the challenges and benefits of their students' using artificial intelligence (AI) tools in the FL classroom?

By addressing this research question, the study aims to provide valuable insights for teachers and institutions regarding the integration of AI into EFL teaching. It is anticipated that these findings will contribute to the growing body of knowledge on AI in education while informing teacher training programs and future research.

3. Research Methodology

Research design

This study employs a mixed-methods design, incorporating both quantitative and qualitative elements. Mixed-methods research is particularly valuable as it combines the strengths of both approaches, offsetting their individual limitations and offering a more comprehensive understanding of the research problem (Creswell & Plano Clark, 2018). The integration of quantitative data provides breadth, while qualitative data adds depth and context, ensuring a holistic exploration of novice English teachers' perspectives on the use of AI tools in language learning.

Participants

A non-random sampling method was utilized to deliberately select participants with specific characteristics relevant to the research focus (Etikan, Musa, & Alkassim, 2016). The sample consisted of novice English language teachers who had recently graduated from various Turkish universities, with a significant proportion being graduates of Tokat Gaziosmanpaşa University during the 2023–2024 academic year. This approach ensured the inclusion of participants from diverse genders and varying levels of teaching experience. The survey sample included 50 novice English teachers as shown in Table 1. while 10 participants from this group were purposively selected for the qualitative component, allowing for an in-depth exploration of their perspectives.

Table 1. *Participants' demographic information*

		N	Percentage
Gender	Male	22	44
	Female	28	56
	Total	50	100
Teaching Experience	Less than 5 years	42	84
	5-10years	8	16
	Total	50	100

Data collection tools

Questionnaire

The quantitative data were collected using a structured questionnaire adapted from existing research on the benefits and challenges of using AI tools in language learning (Guidoum & Saadi, 2024). The questionnaire was disseminated via the messaging platform WhatsApp in the form of a Google Form, with the data collection process spanning four weeks. The questionnaire consisted of three sections. The first section gathered demographic information, including participants' gender and teaching experience. The second section included 6 statements using a 5-point Likert scale designed to measure participants' perceptions of the impact of AI tools on students' performance. Responses were recorded on a 5-point Likert scale ranging from "Strongly Disagree"(1) to "Strongly Agree (5)." The third section included 5 statements focusing on the perceived benefits and challenges of integrating AI tools into language learning classrooms. (See Appendix A)

Interviews

The qualitative data were collected through semi-structured interviews, which are particularly effective in eliciting detailed and nuanced information from participants (Ruslin et al., 2022). A total of 10 novice English teachers participated in the interviews, selected from the survey sample. These interviews were conducted in two stages: the first stage involved online interviews with 8 male participants via Zoom, while the second stage consisted of face-to-face interviews with 2 female participants. Each interview lasted between 30 and 45 minutes. The interview questions focused on the advantages and challenges of using AI tools in the classroom and their perceived impact on students' performance (See Appendix B). This qualitative component provided rich insights that complemented the quantitative findings.

Throughout the data collection process, ethical considerations were prioritized. Participants were assured that their responses would remain anonymous and confidential, and all data were securely stored to prevent unauthorized access. These steps ensured that the study adhered to ethical research standards while collecting reliable and meaningful data.

Data Analysis

The data analysis process was designed to address the research questions comprehensively by analyzing both quantitative and qualitative data collected from the questionnaire and interviews. The quantitative data, collected through Likert-scale items in the questionnaire, were analyzed using descriptive statistical methods. Descriptive statistics were employed to summarize participants' responses, including frequencies, percentages, means, and standard deviations. These measures provided an overview of novice English teachers' perceptions of the benefits and challenges of AI tool using statistical software SPSS. To ensure the reliability of the Likert-scale items, Cronbach's Alpha was calculated, with a coefficient above 0.7 considered acceptable. This step confirmed that the questionnaire items measured the intended constructs consistently.

The qualitative data, obtained from open-ended questions in the questionnaire and follow-up interviews, were analyzed using Braun and Clarke's (2006) six-step process for thematic analysis. First, the data was carefully read and reviewed to become familiar with its content. The responses were transcribed and coded, with an initial coding framework developed based on recurring keywords and phrases, such as "student engagement," "technical difficulties," and "ethical concerns."

In the next step, these codes were grouped into broader categories, forming potential themes. These themes were then reviewed and refined through iterative review to ensure they accurately represented the data. Each theme was clearly defined and named, highlighting its meaning and relevance. Finally, the findings were organized into a clear and concise report, presenting the themes and insights drawn from the data in a way that effectively addressed the research question.

4. Results

The mean and standard deviation of the participants' responses were calculated to address the first part of the research question posed by the study, which is concerned with the perceptions of novice English as a Foreign Language (EFL) teachers on the impact of (AI) on students' performance in EFL classrooms. The results are presented in Table 2.

Table 2. The impact of artificial intelligence on students' performance

Rank	Statement	Mean	SD
1	I have noticed an improvement in students' academic performance (e.g., grades, class participation, and assignment quality) since using artificial intelligence techniques in learning.	3.98	0.795
2	I believe that artificial intelligence techniques help students develop their problem-solving and decision-making skills.	3.92	1.065
3	I have noticed that students have become more independent in their learning thanks to artificial intelligence techniques.	3.86	1.010
4	I have noticed that students have become more capable of applying theoretical knowledge in practical contexts thanks to their use of AI techniques.	3.68	1.019

5	I see that students use critical thinking and analysis skills more effectively when using artificial intelligence techniques in learning.	3.64	0.898
6	I believe that artificial intelligence techniques help improve students' creativity in completing tasks and projects.	3.48	1.281
Overall score		3.67	1.0113

The data presented in Table 2 illustrates the mean and standard deviation of responses to statements exploring the impact of AI techniques on students' performance. The results indicated that the perceptions of novice English language teachers perceive artificial intelligence to have a positive and noticeable impact on the performance of language learners. To illustrate, the deployment of artificial intelligence has led to an enhancement in academic performance, as evidenced by a mean value score of ($M = 3.98$). Similarly, the role of artificial intelligence in assisting language learners with problem-solving and decision-making is also noticeable, with a mean rating of ($M = 3.92$). In brief, the mean values for all statements are above ($M = 3.48$), indicating that the impact of artificial intelligence is markedly positive, and its impact is evident on the performance of English language learners. Moreover, the mean and standard deviation of the participants' responses were calculated to address the second component of the study's research question, which is focused on the perceptions of novice English as a Foreign Language (EFL) instructors on the benefits associated with utilizing artificial intelligence (AI) tools in EFL classrooms. The results are presented in Table 3.

Table 3. *Novice English teachers' perceptions on the benefits of utilizing AI in EFL classrooms*

Rank	Statement	Mean	SD
1	I believe that artificial intelligence techniques (e.g., chatbots, and automated grading systems) help improve the quality of education.	4.06	0.81
2	I believe that artificial intelligence techniques help facilitate the assessment process and provide faster and more accurate feedback to students.	3.94	0.93
3	I believe that artificial intelligence techniques help provide equal educational opportunities for students from different backgrounds and abilities.	3.88	0.91
4	I believe that artificial intelligence techniques may help detect cheating and plagiarism in assignments and tests.	3.84	0.97
5	I believe that artificial intelligence techniques help provide a more interactive and engaging learning environment.	3.60	1.19
Overall score		3.86	0.962

The results presented in Table 3 indicate a significant consensus among respondents that AI tools have a substantial impact on the quality of education. This assertion is supported by the highest average rating ($M = 4.06$) observed in Table 3. This positive perception also applies to the role of artificial intelligence in detecting cheating and plagiarism with an average of ($M = 3.84$), providing a more interactive learning environment with an average of ($M = 3.60$), providing faster and more accurate feedback to learners with an average of ($M = 3.94$) and providing equal educational opportunities for learners from different backgrounds and abilities with an average of ($M = 3.88$). In addition, the total average for all items was ($M = 3.86$), which indicates that artificial intelligence tools have a significant positive role in

English language learning classes from the perceptions of novice English language teachers. In addition, the mean and standard deviation of the participants' responses were calculated to address the third part of the research question posed by the study, which is concerned with the perceptions of novice English as a Foreign Language (EFL) teachers on the challenges of utilizing artificial intelligence (AI) in EFL classrooms. The results are presented in Table 4.

Table 4. *Novice English teachers' perceptions on the challenges of utilizing AI in EFL classrooms*

Rank	Statement	Mean	SD
1	I believe that there is a need for more training and professional development for teachers on how to effectively use artificial intelligence techniques.	4.50	0.614
2	I believe that there is a need to develop clear policies and procedures to ensure the ethical and responsible use of artificial intelligence techniques.	4.14	0.857
3	I fear that the use of artificial intelligence techniques may widen the gap between students who have access to technology and those who do not.	4.14	0.782
4	I believe that over-reliance on artificial intelligence techniques may make students completely dependent on them and reduce their self-effort.	4.04	0.902
5	I believe that artificial intelligence techniques may make it easier for students to cheat on assignments and exams.	3.94	1.167
6	I am concerned that AI techniques may reduce human interaction between me and my students.	3.68	0.998
Overall score		4.07	0.89

As shown in Table 4, one of the challenges that concern novice English teachers is the need for more training and professional development on how to use AI technologies, with an average of ($M = 4.50$) meaning that vast majority of participants agreed on this matter. The need to establish clear policies to ensure the ethical use of AI technologies in teaching and learning English and to widen the gap between students who can access these technologies and those who cannot, with an average of ($M = 4.14$). This also applies to the fear of over-reliance and reducing students' self-effort, with an average of ($M = 4.04$). In addition, the challenges included the role of AI technologies in facilitating cheating on assignments and exams among learners, with an average of ($M = 3.94$). In addition, there was concern that AI technologies might reduce human interaction between novice English teachers and their students, with an average of ($M = 3.68$) which was the lowest between items.

Based on the semi-structured interviews, the participants shared a range of insights, with responses organized into the following key areas:

Teaching Experience and Use of AI Tools

The participants had diverse teaching experiences, ranging from two months to two years. Some had experience in private courses, internships, and tutoring, combining face-to-face and online methods. Vast majority of them had experiences in using AI tools in their teaching processes for instance, participants actively incorporated AI tools stating:

"I use ChatGPT to create engaging lesson content, generate practice exercises, and clarify complex concepts." (Interviewee 4)

"I occasionally use AI tools in my teaching, but not as a central part of the lesson." (Interviewee1)

The role of artificial intelligence in supplementing conventional pedagogical approaches was also a topic of discussion. This included the preparation of lesson plans and the design of activities to facilitate effective language learning. The participants' opinions were shared in this context.

"I used an AI tool to create images for my course, like fishes with numbers for a vocabulary game. The students liked it so much!" (Interviewee2)

Benefits and challenges of AI in EFL classrooms

Participants identified several benefits of AI tools, including accessibility, instant feedback, skill development, the ease of using artificial intelligence tools in language learning and their adaptation to learners' levels as they stated:

"AI tools allow students to practice anytime and anywhere, making learning more flexible." (Interviewee1)

"Authentic tasks like role-playing with AI chatbots improve my students' speaking skills and help them produce language naturally in real life." (Interviewee5)

"AI tools provide personalized feedback, which allows students to focus on their individual weaknesses." (Interviewee7)

"AI tools help students practice without searching for examples on the internet. They can specify the topic and difficulty level, and then practice easily." (Interviewee10)

Despite of the advantages of artificial intelligence (AI) in English language learning are widely acknowledged by novice teachers, several challenges and concerns have also emerged. The most significant issue is the excessive reliance on AI, which can foster laziness and a lack of self-reliance. Additionally, there are concerns about the accuracy of the information generated by AI, the technical barriers it faces, and its ability to adequately address the diverse needs of English language learners. Participants in the study articulated these concerns stating:

"Students might use it as a shortcut instead of developing their own skills." (Interviewee1)

"AI is not always accurate, and students don't check if the information is reliable." (Interviewee3)

“If you cannot enter the prompt properly, you can get all the information except what you want.” (Interviewee4)

“Some AI tools cannot meet students’ wishes exactly. So, they need to check AI tools’ answers, just like I do. When they don’t check, they fail” (Interviewee7)

“AI allows students to be more creative and productive, yet it pays the way of laziness on students” (Interviewee10)

5. Conclusion

The findings align with existing literature, highlighting both the potential and limitations of AI tools in education. While novice teachers acknowledge the transformative potential of AI, they stress the need for balanced integration that prioritizes ethical use and preserves teacher-student interaction. Training programs tailored for novice educators must address these challenges, equipping them with the necessary skills and confidence to effectively incorporate AI tools.

According to the results of this mixed method study, novice English teachers have positive perceptions about the role of AI in EFL classes. For example, the sum of the averages of the elements of Table 2, which focused on the role of AI techniques in developing the performance of language learners, was ($M= 3.67$), indicating a noticeable positive impact. Similarly, the results of Table 3, which focused on the benefits of AI in EFL classes, showed several positive opinions, the highest average of which was ($M= 4.06$), which indicated the role of AI techniques in developing the quality of education. Regardless of the positives resulting from AI and its noticeable positive role, the research results also concluded some challenges and concerns expressed by novice English teachers in Table 4, the most important of which was the need for development and professional training on the use of AI , which recorded an average value of ($M= 4.50$) Also, the total averages for the items that focused on challenges were ($M= 4.07$), which in turn is very high, indicating the need to take them into consideration. In addition, the results of the semi-structured interviews also played a major role in this research. It was concluded through the opinions of teachers that there are several benefits of AI in EFL classes, including accessibility, immediate feedback, and independence in learning. In addition, there are also some challenges, including over -reliance on AI techniques, which reduces self-reliance. Furthermore, there were suggestions from novice English language teachers to improve AI techniques and exploit them properly, including the need for a method that can balance the role of these technologies and the role of teachers, stressing the importance of the human role in managing these technologies as they are an integral part of this process.

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Appendix A – Questionnaire Section 1

Please indicate your level of agreement with the following statements:					
6. Artificial Intelligence					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I have noticed an improvement in students' academic performance (e.g., grades, class participation, assignment quality) since using artificial intelligence techniques in learning.					
I see that students use critical thinking and analysis skills more effectively when using artificial intelligence techniques in learning.					
I believe that artificial intelligence techniques help students develop their problem-solving and decision-making skills.					
I have noticed that students have become more independent in their learning thanks to artificial intelligence techniques.					
I believe that artificial intelligence techniques help improve students' creativity in completing tasks and projects.					
I have noticed that students have become more capable of applying theoretical knowledge in practical contexts thanks to their use of artificial intelligence techniques.					

7. Benefits					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I believe that artificial intelligence techniques (e.g., chatbots, and automated grading systems) help improve the quality of education.					
I believe that artificial intelligence techniques may help detect cheating and plagiarism in assignments and tests.					
I believe that artificial intelligence techniques help provide a more interactive and engaging learning environment.					
I believe that artificial intelligence techniques help facilitate the assessment process and provide faster and more accurate feedback to students.					
I believe that artificial intelligence techniques help provide equal educational opportunities for students from different backgrounds and abilities.					

Appendix A – Questionnaire Section 2

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I am concerned that artificial intelligence techniques may reduce human interaction between me and the students.					
I believe that over-reliance on artificial intelligence techniques may make students completely dependent on them and reduce their self-effort.					
I believe that there is a need for more training and professional development for teachers on how to effectively use artificial intelligence techniques in teaching.					
I believe that there is a need to develop clear policies and procedures to ensure the ethical and responsible use of artificial intelligence techniques in education.					
I fear that the use of artificial intelligence techniques may widen the gap between students who have access to technology and those who do not.					
I believe that artificial intelligence techniques may make it easier for students to cheat on assignments and exams.					

Appendix A – Questionnaire Section 3

Appendix B: Interview Questions

1. How many years of experience do you have in teaching English?
2. What is your general perspective on the use of artificial intelligence by students in foreignlanguage learning?
3. Do you incorporate AI tools into your teaching practices?
4. At what stage(s) of your lesson do students typically engage with AI tools during theirEnglish learning process?
5. Which AI tools do students most commonly use in their learning?
6. What benefits do you perceive for students when utilizing these AI tools?
7. What are the primary challenges that students encounter when using AI in their learning?
8. Is there any additional information you would like to provide on this topic?

Innovating for Impact: Transforming Early Years Learning in the Baltistan Region through Play, Inclusion, and Local Wisdom

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Abstract

This study explores an innovative model of early childhood education rooted in the unique cultural and geographical context of Baltistan. It aims to demonstrate how integrating indigenous knowledge systems with modern pedagogical practices enhances learning outcomes and emotional well-being among young children. The research draws on data collected through teacher training sessions, classroom observations, and curriculum development efforts led by the Life Development and Training Institute (LDTI). Using a qualitative methodology, the study analyzes the implementation of play-based learning, inclusive strategies, and reflective teaching practices. Key findings reveal that contextualizing education through local stories, nature-based learning, and community engagement not only boosts children's cognitive development but also strengthens their cultural identity and social skills. The paper underscores the importance of continuous professional development for teachers and highlights the impact of collaborative learning environments. Implications of the study suggest that blending global educational innovations with culturally responsive methods can create sustainable models for early years education in remote and underserved regions.

Keywords: *Early childhood education, play-based learning, indigenous knowledge, teacher training, cultural relevance*

1. Introduction

Early childhood education plays a critical role in shaping lifelong learning, cognitive development, and social-emotional skills. In remote and culturally rich regions like Baltistan, educational practices must not only address global learning standards but also reflect local realities, values, and traditions. However, mainstream early years education models often overlook the significance of indigenous knowledge systems, community engagement, and the unique developmental needs of children in such contexts.

This study aims to explore an innovative approach to early years education contextualized within the Baltistan region. It builds on the practical experiences of the Life Development and Training Institute (LDTI), which has led multiple initiatives in teacher training, curriculum development, and classroom transformation. By integrating play-based learning, inclusive pedagogy, and culturally relevant content, the study seeks to demonstrate how meaningful and sustainable learning can be achieved in early childhood settings.

The significance of this study lies in its potential to inform policy, teacher training programs, and curriculum design for similar underserved areas. It provides evidence on how combining modern educational methodologies with local knowledge and community involvement can create impactful, resilient, and inclusive early years learning environments.

2. Literature Review

Early childhood education (ECE) has been widely recognized as a foundational stage for lifelong learning and development. Theoretical frameworks by Piaget (1962) and Vygotsky (1978) emphasize the importance of play, social interaction, and scaffolding in early learning. Piaget highlights cognitive development through active exploration, while Vygotsky underscores the role of socio-cultural context and the Zone of Proximal Development (ZPD) in shaping children's learning experiences.

Empirical studies have validated the effectiveness of play-based and child-centered approaches. Research by Siraj-Blatchford et al. (2002) shows that pedagogies focusing on active learning, dialogue, and social interaction significantly enhance children's cognitive and language skills. Similarly, UNESCO (2020) advocates for inclusive and culturally responsive early years education, especially in marginalized communities.

In the context of indigenous and rural education, studies (e.g., Fleer, 2006; Sinha & Saraswathi, 2015) emphasize the integration of local knowledge systems, storytelling, and nature-based learning to foster meaningful and culturally grounded education. Furthermore, teacher professional development has been linked to improved pedagogical practices and learner outcomes (Darling-Hammond et al., 2017).

This literature supports the study's premise that blending global pedagogical principles with localized strategies can lead to more relevant, effective, and equitable early childhood education in regions like Baltistan.

3. Methodology

This study adopted a qualitative research design to explore innovative and culturally responsive early childhood education practices in the Baltistan region. A case study approach was used to examine the training programs, classroom settings, and curriculum design efforts implemented by the Life Development and Training Institute (LDTI).

Participants

The study involved 25 early years teachers, 5 school heads, and 3 community members from various rural and semi-urban schools in Baltistan who participated in LDTI's professional development initiatives.

Data Collection Tools

Data were collected through:

Semi-structured interviews with teachers and school leaders to capture their perspectives on training, pedagogy, and student engagement.

Focus group discussions with community members to understand local expectations and cultural relevance.

Classroom observations to examine teaching practices, child participation, and use of materials.

Review of lesson plans, training content, and classroom displays to support contextual understanding.

Data Analysis Procedures

Manual thematic analysis was conducted. Interview and observation notes were carefully read, coded, and categorized by emerging themes. Patterns were identified through repeated reading and comparison, focusing on the integration of play-based learning, local knowledge, and reflective teaching. The analysis emphasized authenticity, context, and the voices of participants to ensure rich, meaningful insights.

4. Findings and Discussion

The study revealed several key findings related to the implementation of innovative, culturally responsive early childhood education in Baltistan.

Integration of Play-Based and Local Learning

Teachers who participated in the LDTI training began to effectively incorporate play-based methods rooted in local culture, such as storytelling, traditional games, and nature-based activities. This approach increased student engagement, creativity, and emotional expression. These findings align with Piaget's theory of learning through active exploration and Vygotsky's emphasis on social context in cognitive development.

Teacher Transformation Through Professional Development

Teachers reported improved confidence and classroom management skills as a result of continuous professional development. Reflective practices, encouraged during training, helped them adapt global strategies to their local realities. This supports literature by Darling-Hammond et al. (2017), which highlights the importance of ongoing, context-specific training for impactful teaching.

Cultural Relevance Promotes Identity and Inclusion

The use of local language, stories, and materials fostered a sense of belonging and pride among children. This mirrors findings by Fleer (2006) and UNESCO (2020), which stress that culturally grounded education enhances inclusion and self-esteem in early learners.

Community Engagement Strengthens Sustainability

Involving parents and community elders in learning activities helped reinforce school-home connections and preserved indigenous knowledge. This supports Sinha and Saraswathi's (2015) emphasis on community participation in educational reform.

Overall, the study demonstrates that blending modern pedagogical approaches with local culture not only enriches learning experiences but also strengthens the identity, social-emotional skills, and confidence of both teachers and learners in underserved regions.

5. Conclusion

This study explored an innovative model of early childhood education tailored to the unique cultural and geographical context of Baltistan. Key findings highlight the positive impact of integrating play-based learning with indigenous knowledge, fostering culturally relevant, emotionally responsive, and inclusive classroom environments. Teachers benefited significantly from targeted professional development, becoming more reflective and confident in adapting modern pedagogical tools to local needs. Furthermore, community involvement emerged as a powerful factor in sustaining meaningful learning experiences and preserving cultural heritage.

Implications

The study suggests that early years education in marginalized regions can be significantly enhanced by blending global best practices with local traditions. Policymakers, education planners, and NGOs should prioritize culturally responsive curricula, teacher training, and community engagement in early childhood programs.

Limitations

The study was limited to a small sample within Baltistan, and findings may not be generalizable to other regions without similar cultural or environmental contexts. Additionally, as a qualitative study, the findings are interpretive rather than statistically representative.

Future Directions

Future research could expand to include quantitative data and comparative studies across different rural regions. Longitudinal studies are also recommended to assess the long-term impact of these educational innovations on children's development and community growth.

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School Administrators' Perceptions of Digital Well-Being: Constant Connectivity, Burnout, and the Pursuit of Digital Balance

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Abstract

The integration of digital technologies into educational environments has led to fundamental changes in the working practices of school administrators, while the transfer of managerial responsibilities to digital platforms has brought the concept of “digital well-being” to the forefront. In this context, the aim of this study is to examine school administrators’ perceptions of digital well-being in increasingly digitalized educational settings; and to analyze in depth their experiences related to constant connectivity, digital burnout, and efforts to establish digital balance, thereby identifying the key dynamics affecting managerial well-being in the digital age. The study was designed using the phenomenological approach, one of the qualitative research methods, and semi-structured interviews were conducted with 14 school administrators working at different educational levels. The data obtained from the interviews were analyzed using content analysis. The findings reveal that school administrators conceptualize digital well-being as a multidimensional phenomenon. Participants stated that being constantly online made time management more difficult, disrupted their work-life balance, and at times increased feelings of managerial burnout. The necessity of remaining constantly connected was found to restrict both personal and professional boundaries, increase mental fatigue, and negatively affect decision-making processes. In particular, the frequent use of instant messaging applications and digital communication channels was shown to create a perceived pressure on administrators to remain perpetually accessible. Nevertheless, some participants reported developing personal strategies to maintain digital balance, such as setting boundaries, restructuring time management, and taking digital breaks. In conclusion, school administrators view the state of constant connectivity brought about by the digital age not merely as a technical requirement, but as a critical issue that directly impacts managerial well-being. The sustainability of digital well-being depends not only on individual awareness and self-regulation but also on the presence of institutional support systems and inclusive leadership practices. These findings highlight the need to address digital well-being in educational leadership both at the individual and structural levels and point to the necessity of developing comprehensive policy recommendations in this area.

Keywords: *Digital Well-Being, Constant Connectivity, Digital Burnout, Digital Balance, School Administrators*

1. Introduction

Digital transformation has led to rapid technological advances that have radically changed the way we interact and conduct activities in today's working life (Moliner et al., 2023). Although digital tools bring practicality and convenience to work processes, excessive and continuous use of these tools can have negative effects on individuals such as digital burnout (Choi & Kim, 2024). In this context, the increasing interest in the effects of digital technologies on individuals' quality of life in recent years has brought the concept of digital well-being to the forefront as both a research area and a social need (Tayiz et al., 2025). Digital well-being is a concept that allows individuals to maintain their physical, mental and social health by establishing a healthy and balanced relationship with digital technologies (Büchi, 2024). This concept aims not only to avoid the harms caused by technology, but also to improve the overall quality of life of individuals by using digital tools consciously, balanced and purposefully (Moliner et al., 2023). Especially in a social environment where digital media tools are constantly accessible, emotional and cognitive components such as positive emotions, satisfaction in work and social relationships, and general life satisfaction constitute the basic building blocks of digital well-being (Vanden Abeele et al., 2022).

The effects of digitalization at the individual and societal level also manifest themselves strongly in working life. While digital technologies have transformed the processes of doing business, communicating and collaborating, they have also brought along various risks to employee well-being (Tayiz et al., 2025). Intensive and uncontrolled use of digital platforms such as social media can lead to problems such as time management problems, distraction, and blurring of boundaries between private life and work life (Vanden Abeele et al., 2022). This can lead to serious consequences such as decreased productivity, difficulty in focusing on tasks and burnout syndrome. Indeed, the European Digital Competencies Framework (DigComp) defines digital health and well-being as one of the key components of digital competencies (Moliner et al., 2023). This definition reveals that digital well-being is a holistic issue that needs to be addressed not only with individual awareness, but also at the structural and institutional level. The overarching dimensions of digital well-being include mental, physical and emotional health, which includes individuals' ability to establish and maintain a healthy interaction with digital tools (Tayiz et al., 2025). Schmidmaier (2019) states that digital wellbeing is built on four key elements: time, trust, social skills and health.

With the COVID-19 pandemic, the phenomenon of digital burnout has become more visible; during this period, people's work, education and social lives have largely moved to digital platforms, leading to a significant increase in internet use (Sharma et al., 2020). Digital burnout has been triggered by factors such as excessive screen time, pressure to be constantly connected and information overload, resulting in increased stress levels, decreased performance and decreased psychological resilience (da Silva, 2024; Yang & Du, 2024). It has been observed that social media use increases mental problems such as depression and anxiety, especially in young individuals, while automation and digital performance monitoring systems create stress and pressure in work environments. In addition, factors such as the length of time spent in digital environments, the complexity of content, and the negative effects of persuasive technologies on intrinsic motivation make it difficult for

individuals to establish healthy relationships with the digital world (Burr et al., 2020). When all these factors are evaluated, it is clear that digitalization should be evaluated together with its ethical, psychological and social aspects and that digital well-being is not only an individual responsibility, but also a strategic issue that should be integrated into educational policies and business life.

With the rapid spread of digital technologies, administrative processes in educational institutions have started to be carried out through digital tools. This transformation has radically changed the way school administrators do business, communicate and make decisions. This situation makes it difficult for administrators to establish a work-life balance and brings negative effects such as digital burnout, stress and distraction. Digital well-being is a multidimensional concept that enables individuals to establish a healthy and balanced relationship with digital technologies and aims at the sustainability of physical, mental and social health. However, in the existing literature, studies addressing the reflections of digital well-being on school administrators are quite limited. The state of being constantly connected brought about by working in a digital environment, digital communication.

2. Method

This research is a qualitative study that focuses on examining school administrators' perceptions and experiences of the concept of “digital well-being” in digitalized educational environments. In the study, phenomenology design was used to reveal the meanings based on the experiences of the participants. Phenomenology is an approach to research concerned with the lived experiences of individuals, defined as the science of pure ‘phenomena’, which aims to uncover the meaning of people's experiences of a subject, to understand the world from the perspective of subjects (Groenewald, 2004). By examining an experience as it is subjectively lived, new meanings and appreciations can be developed to inform and even redirect how we understand that experience (Lavery, 2003). In this direction, the focus was on the lived experience of the interviewee and the structure of this experience rather than the participants' views on the experience. In addition, this research benefited from the phenomenology of Hermeneutics based on Heidegger. Heidegger is interested in humans as actors in the world and therefore focuses on the relationship between an individual and his or her lifeworld (Neubauer, Witkop & Varpio, 2019). With this approach, researchers collect data through interviews and analyze it to reveal themes and meanings, helping individuals understand how they make sense of their experiences.

Study Group

Information regarding the school administrators included in the study group is presented in Table 1.

Table 1. Demographic Characteristics of the Study Group

Participant Code	Gender	School Level	Experience (Years)
Participant 1	Male	Primary School	8
Participant 2	Female	Middle School	12
Participant 3	Male	High School	15
Participant 4	Male	Middle School	6
Participant 5	Male	High School	10
Participant 6	Female	Primary School	13
Participant 7	Female	Middle School	7
Participant 8	Female	Primary School	9
Participant 9	Male	High School	18
Participant 10	Female	Primary School	5
Participant 11	Male	High School	11
Participant 12	Female	Middle School	14
Participant 13	Male	High School	6
Participant 14	Female	Middle School	8

Table 1 presents the demographic distribution of the 14 school administrators who participated in the study. The table provides detailed information regarding the participants' gender, the type of school in which they work (primary, middle, or high school), and their years of administrative experience. The sample consists of 7 female and 7 male administrators, which enabled the analysis of gender-based differences in professional experiences. In terms of school levels, the distribution includes 4 primary school, 5 middle school, and 5 high school administrators. The participants' years of experience as school administrators range from 5 to 18 years.

Data Collection and Analysis

An interpretative phenomenological approach was adopted in the data analysis phase. Interpretive approach focuses on finding the basic meaning and structure of experience (Alhazmi & Kaufmann, 2022). Unlike other approaches, with this approach the researcher plays an active role in the interpretive process (Neubauer, Witkop & Varpio, 2019). The interpretive approach is concerned with the emergent themes (structure) that define the fundamental and inescapable aspects of experience (Alhazmi & Kaufmann, 2022).

During data collection and analysis, the researcher reflects the main themes of the participants' experience of the phenomenon, while at the same time reflecting her own experience (Neubauer, Witkop & Varpio, 2019). The data analysis process was carried out by focusing on how the data contributed to the understanding of the phenomena. The research

was based on Delve, Ho & Limpaecher (2023) IPA (Interpretive Phenomenological Analysis) stages:

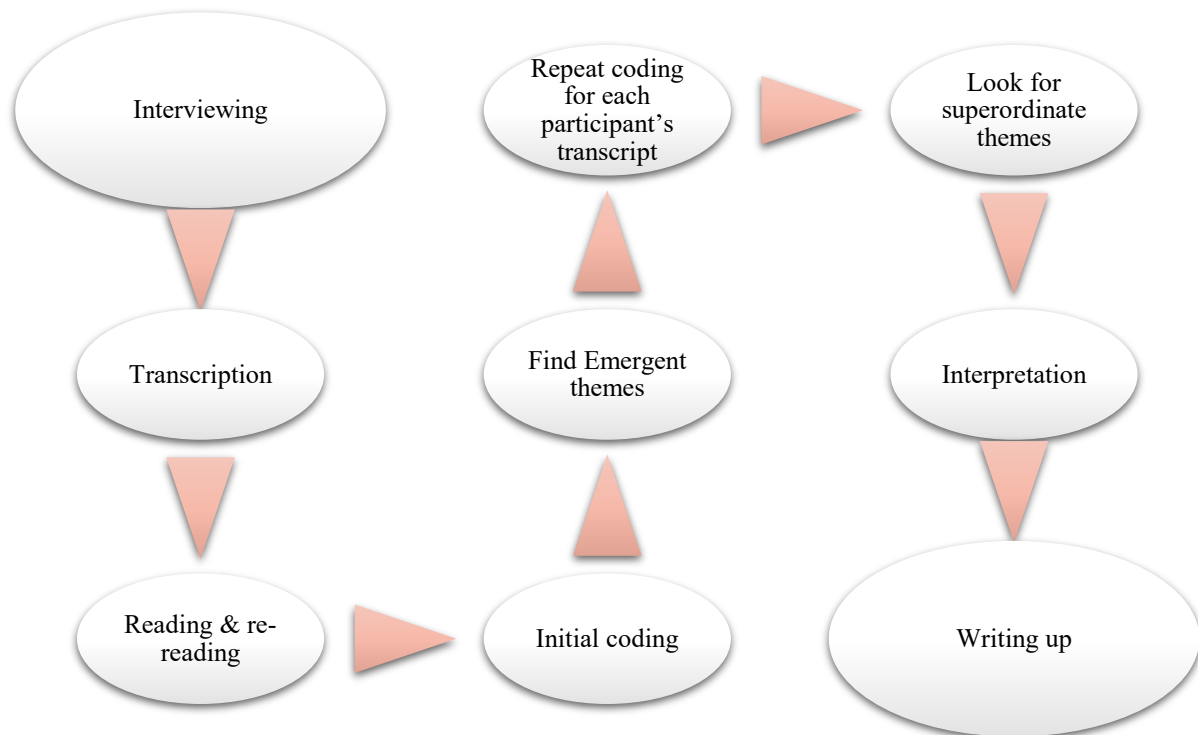


Figure 1. IPA stages (Delve, Ho & Limpaecher, 2023).

During the interview phase, the researchers aimed to reveal the experiences and thoughts of the participants through a semi-structured interview form during the one-on-one interview phase with the participants. During the transcript phase, the researchers collected detailed and complete data from the participants' opinions during the interviews. The questions in the semi-structured interview form:

1. *As a school administrator, how do you experience being constantly accessible in digital environments? Can you share the moments that challenged you the most?*
2. *When you think about the effects of digitalization on your administrative responsibilities, in which areas do you observe that you experience more mental fatigue?*
3. *How do you organize your relationship with digital tools in terms of maintaining work-life balance? Do you think you are successful in this regard?*
4. *Were there times when you thought you experienced digital burnout? If so, how did you overcome this situation?*
5. *In your opinion, what should be done at the school or education system level, apart from individual efforts, to support digital well-being?*

After the data were collected, the interview forms were read several times during the reading and re-reading process, and each time a better idea of the general themes and meanings that emerged was attempted. At this stage, bracketing has begun. In phenomenology, "bracketing" is the researcher's conscious effort to set aside his or her own prejudices, preconceptions,

assumptions, personal experiences, and theoretical concepts so as not to interfere with the phenomenon he or she is studying or the experiences of the participants (Tufford & Newman, 2012). In the first coding phase, a free trial version of the qualitative data analysis program Delve was used. The researchers created codes from the obtained data. The opinions related to the codes were placed in the relevant codes. Themes were then created from the resulting codes. In the "repeat coding for each participant's transcript" phase, as stated by Delve, Ho & Limpaecher (2023), the researchers repeated steps 4 and 5 to make checks. Afterwards, the themes were compared and high-level themes were created from them. In the interpretation phase, the aim was to reveal and emphasize the unique characteristics of each participant and to present them as objectively as possible. Finally, when the researchers wrote down their findings, verbatim quotes from the participants were included to illustrate the key themes and findings.

Validity and reliability

Peer debriefing is an important practice to increase the reliability of research. Peer debriefing allows a qualified peer researcher to review and evaluate transcripts, the resulting categories from those transcripts, and the final themes or findings of a particular study (Janesick, 2007). The research process was carried out with the evaluations of the relevant expert in order to eliminate bias on the part of the researchers. This independent reading of the data by a peer helped ensure the quality of the study and the consistency and interpretability of the data.

Krippendorff's Alpha is a powerful statistical measure used to measure the strength of agreement between different coders, especially in qualitative research, which accounts for chance agreement and is preferred for publications (Delve, Ho & Limpaecher, 2023). Krippendorff's Alpha score was calculated after three coders coded independently with the Delve program. Alpha values for each code ranged between 0.76 and 0.84. These results show that there is a generally acceptable level of consistency between the coders.

3. Findings

School administrators were asked the question: *"As a school administrator, how do you experience being constantly accessible in digital environments? Can you share the moments that challenged you the most?"* The findings obtained from their responses are presented in Figure 2.

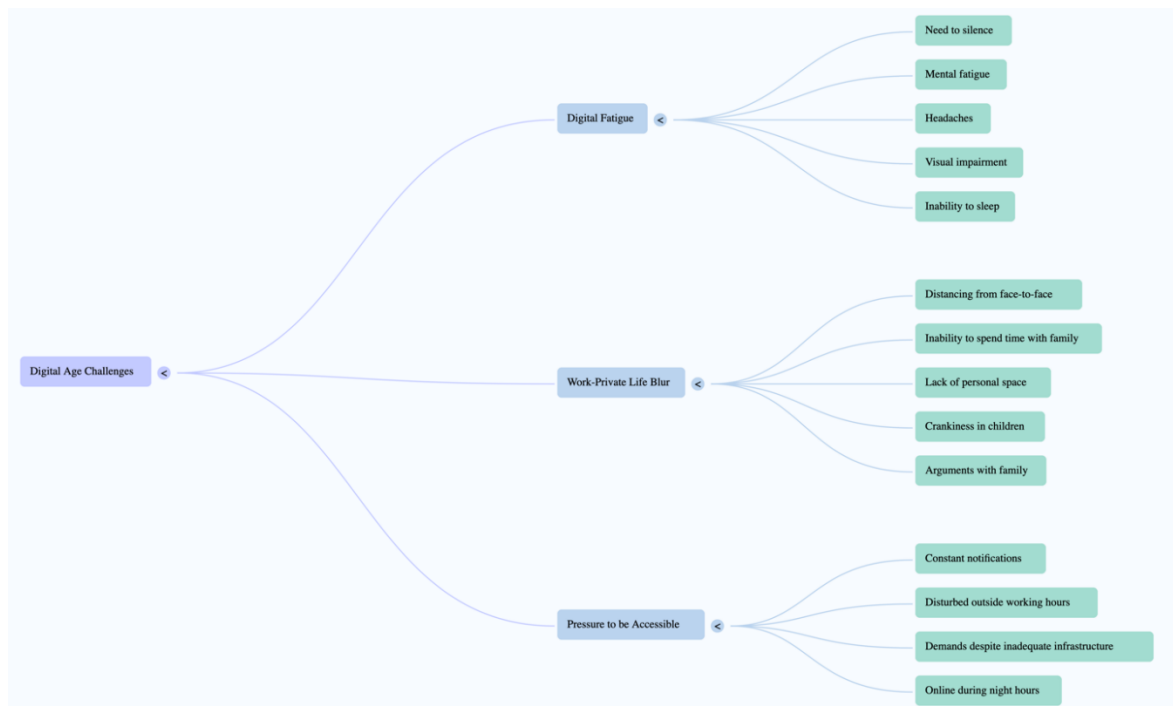


Figure 2. *Categories and Codes Derived from the Theme of Digital Age Challenges*

As shown in Figure 2, school administrators' perceptions of the challenges they face in the digital age are grouped under three main categories. The first category, “Digital Fatigue”, refers to the adverse physical and psychological conditions experienced by administrators due to the constant use of digital environments. The codes associated with this category include “*Need to silence*”, “*Mental fatigue*”, “*Headaches*”, “*Visual impairment*”, and “*Inability to sleep*”. Participants’ statements indicate that being continuously connected digitally has negative effects on both their physical and mental well-being.

The second category, “Work–Private Life Blur”, focuses on how digitalization impacts administrators' personal lives and family relationships. Prominent codes in this category include “*Distancing from face-to-face*”, “*Inability to spend time with family*”, “*Lack of personal space*”, “*Crankiness in children*”, and “*Arguments with family*”. The findings suggest that the persistent nature of digital interaction disrupts the balance between work and private life, weakening social and familial bonds.

The third category, “Pressure to be Accessible”, reflects the expectation placed on administrators to remain constantly available in digital settings. Codes in this category include “*Constant notifications*”, “*Disturbed outside working hours*”, “*Demands despite inadequate infrastructure*”, and “*Online during night hours*”. These findings reveal that the digital age imposes working patterns that extend beyond traditional working hours, creating a psychological burden for school administrators.

Selected excerpts from participants’ responses related to this theme are presented below.

Participant 6: *“I am expected to be online all the time during the day, and even outside of work hours, I am expected to respond to messages from WhatsApp or e-mails. While spending time with my family in the evening, the phone may suddenly ring for a situation that needs to be resolved. Even if the phone does not ring, a message comes from WhatsApp. This negatively affects both my private life and my mood.”*

Participant 2: *“Some days I am constantly texting on WhatsApp from morning to night. Teachers, parents, district directorate are all trying to reach me through different channels. I get very tired mentally. Especially the messages that come on the weekends are very difficult for me because I cannot take my mind off work. I do not even have the freedom to turn off the phone and rest.”*

Participant 12: *“I find this situation both advantageous and challenging. It is useful for fast communication in times of crisis, but this accessibility sometimes exceeds the limits. A student’s parent sends a message at 11 at night and expects a response. Even though I want to hang up at that moment, I answer the phone with a sense of responsibility.”*

Participant 4: *“Being accessible at all times sometimes makes me feel like a machine. Human relations have also become digital. Even issues that should be discussed face-to-face are now being tried to be solved with digital messages. This increases emotional wear and tear. There may also be situations where I see the message but cannot respond. In such cases, I am blamed for not responding.”*

Participant 5: *“The fact that the internet connection is not always good creates additional pressure because I respond late to messages when I am already stressed. The responsibility that comes with being constantly accessible sometimes brings with it the feeling that I cannot do my job properly.”*

School administrators were asked the question: “When you think about the effects of digitalization on your administrative responsibilities, in which areas do you observe that you experience more mental fatigue?” The findings obtained from their responses are presented in Figure 3.

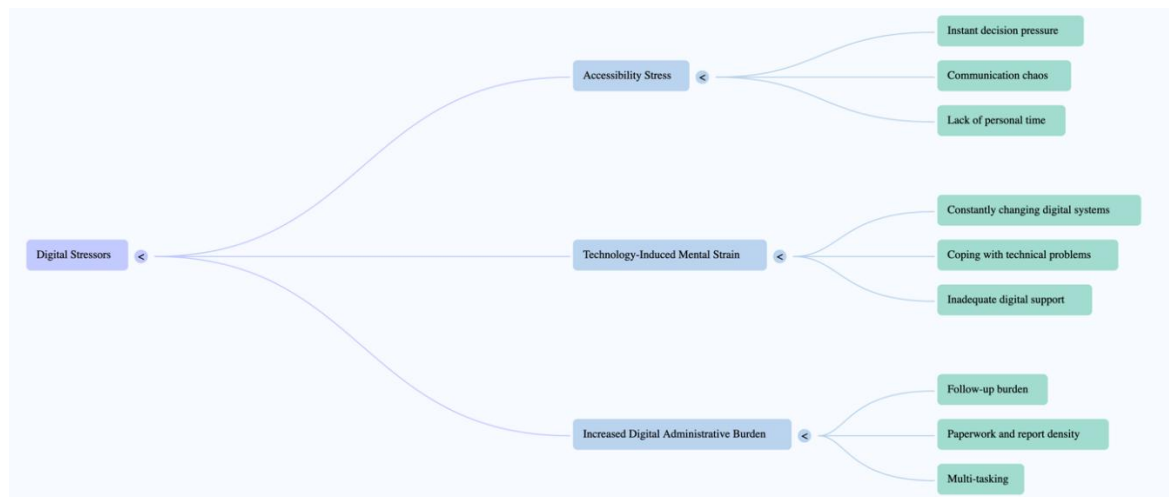


Figure 3. *Categories and Codes Derived from the Theme of Digital Stressors*

As illustrated in Figure 3, the stress factors experienced by school administrators during the digitalization process are grouped under three main categories. The first category, “Accessibility Stress”, includes stress elements arising from the constant digital availability expected of administrators. Prominent codes in this category are “*Instant decision pressure*”, “*Communication chaos*”, and “*Lack of personal time*”. These findings reveal that digital environments expose school administrators to pressures of immediate decision-making, disorganized communication flows, and the erosion of personal time.

The second category, “Technology-Induced Mental Strain”, highlights the cognitive difficulties experienced by administrators due to intensive technology use. Codes emerging under this category include “*Constantly changing digital systems*”, “*Coping with technical problems*”, and “*Inadequate digital support*”. The findings indicate that the ongoing evolution of digital systems, persistent technical issues, and insufficient support structures collectively contribute to substantial mental strain for administrators.

The third category, “Increased Digital Administrative Burden”, refers to the expanding volume of administrative responsibilities caused by digital platforms. This includes codes such as “*Follow-up burden*”, “*Paperwork and report density*”, and “*Multi-tasking*”. The findings suggest that digitalization has intensified monitoring responsibilities, increased documentation and reporting requirements, and necessitated simultaneous task management, all of which exacerbate administrators’ cognitive load.

Selected excerpts from school administrators’ statements related to this theme are provided below.

Participant 3: “*For example, there is always a meeting, an e-mail, I deal with it, and then I see that they have asked for another document. You know, you can’t stop and take a breath. There is always something. It inevitably weighs on my mind. It is evening, I am still thinking ‘did I do this?’ My mind never seems to be empty.*”

Participant 9: “Now, we used to go and talk, the problem would be solved. Now everything is through correspondence. Messages, e-mails, this group, that group... You have to look at all of them. I don’t know which one to reach. When they all pile up, your brain literally stops. Sometimes I feel very tired, but you can’t explain it to anyone.”

Participant 7: “For example, even when I prepare the teacher’s duty roster, I send it to the WhatsApp group, then everyone writes, ‘it can’t be like this, why is it like this?’ Fix this, fix that... These things used to be easier, now when it is digital, everything is very complicated, let me say my brain gets muddled.”

School administrators were asked the question: “How do you organize your relationship with digital tools in terms of maintaining work-life balance? Do you think you are successful in this regard?” The findings obtained from their responses are presented in Figure 4.

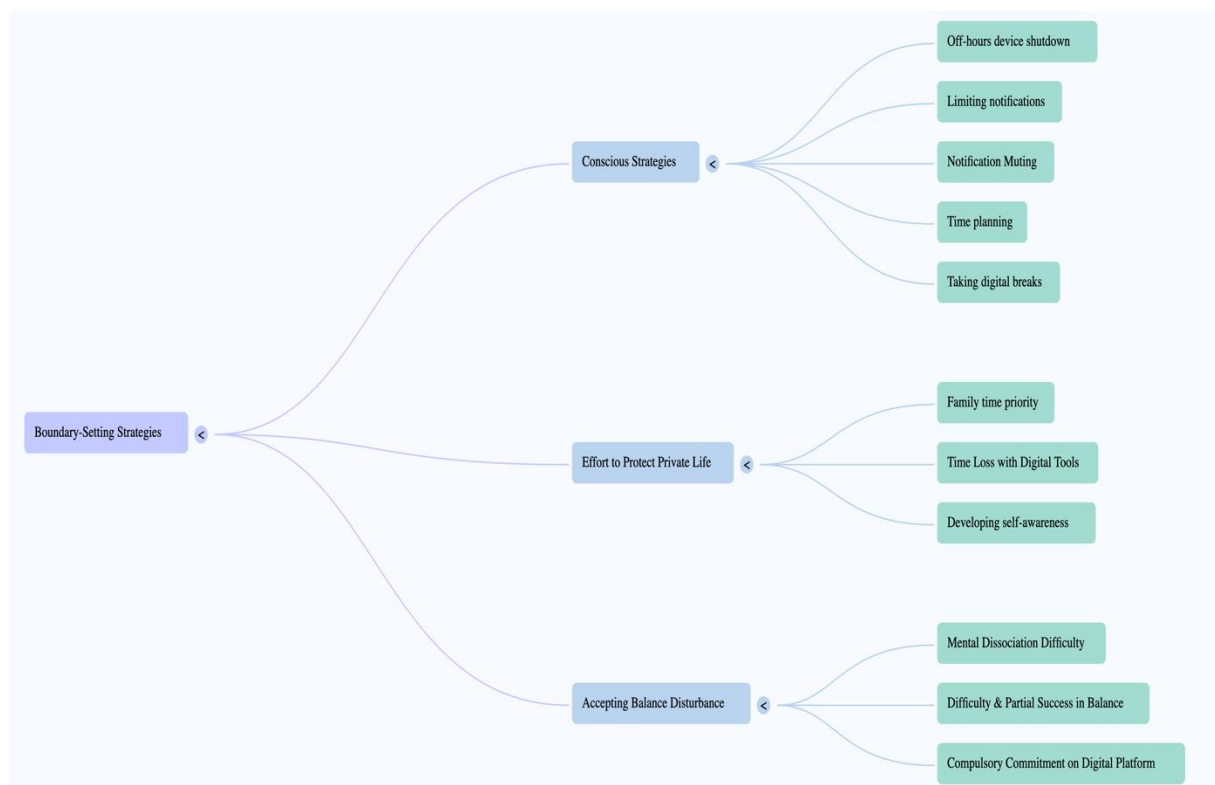


Figure 4. Categories and Codes Derived from the Theme of Boundary-Setting Strategies

As illustrated in Figure 4, the strategies used by school administrators to maintain boundaries in digital environments are grouped under three main categories. The first category, “Conscious Strategies”, highlights administrators’ deliberate and structured efforts to manage their digital engagement. The codes under this category include “*Off-hours device shutdown*”, “*Limiting notifications*”, “*Notification muting*”, “*Time planning*”, and “*Taking digital breaks*”. These findings show that administrators attempt to set clear and intentional boundaries around their use of digital tools to alleviate the burden of constant connectivity.

The second category, “Effort to Protect Private Life”, emphasizes the initiatives administrators take to safeguard their personal lives. The relevant codes in this category are “*Family time priority*”, “*Time loss with digital tools*”, and “*Developing self-awareness*”. The data suggest that participants prioritize family interactions and engage in self-reflection to mitigate the negative effects of digital encroachment into personal life.

The third category, “Accepting Balance Disturbance”, reflects the administrators’ recognition of the challenges in maintaining a clear work-life boundary and their adaptive responses to these challenges. The codes emerging from this category include “*Mental dissociation difficulty*”, “*Difficulty & partial success in balance*”, and “*Compulsory commitment on digital platform*”. These findings indicate that some administrators acknowledge the difficulty of achieving an ideal balance and instead strive to adapt to the demands of the digital environment while maintaining as much personal control as possible.

Selected excerpts from school administrators’ statements related to this theme are provided below.

Participant 8 : *“I mean, I can’t say that I can organize it completely. My phone is always in my hand, I constantly check to see if anything comes from the school group. Things actually continue after I get home. Sometimes I check to see if an e-mail has arrived even when I’m playing with my child. Am I successful in this regard? Not very successful, I guess.”*

Participant 12: *“I set a rule for myself, I don’t answer my phone after nine in the evening. But of course, it doesn’t always happen, there are emergencies, for example, when the district wants something, you have to answer it. But I still try to set boundaries as much as I can. Even if I’m not completely successful, it relaxes me a little.”*

Participant 14: *“Well, teacher, it’s not easy to strike a balance. Especially when there’s a crisis at school, working hours don’t matter at all. I still receive messages and meetings on the weekends. I deleted my social media accounts from my phone at one point, it put my mind at ease, but then things got slower. I mean, I try, but have I been able to strike a balance? No.”*

School administrators were asked the question: “Were there times when you thought you experienced digital burnout? If so, how did you overcome this situation?” The findings obtained from their responses are presented in Figure 5.

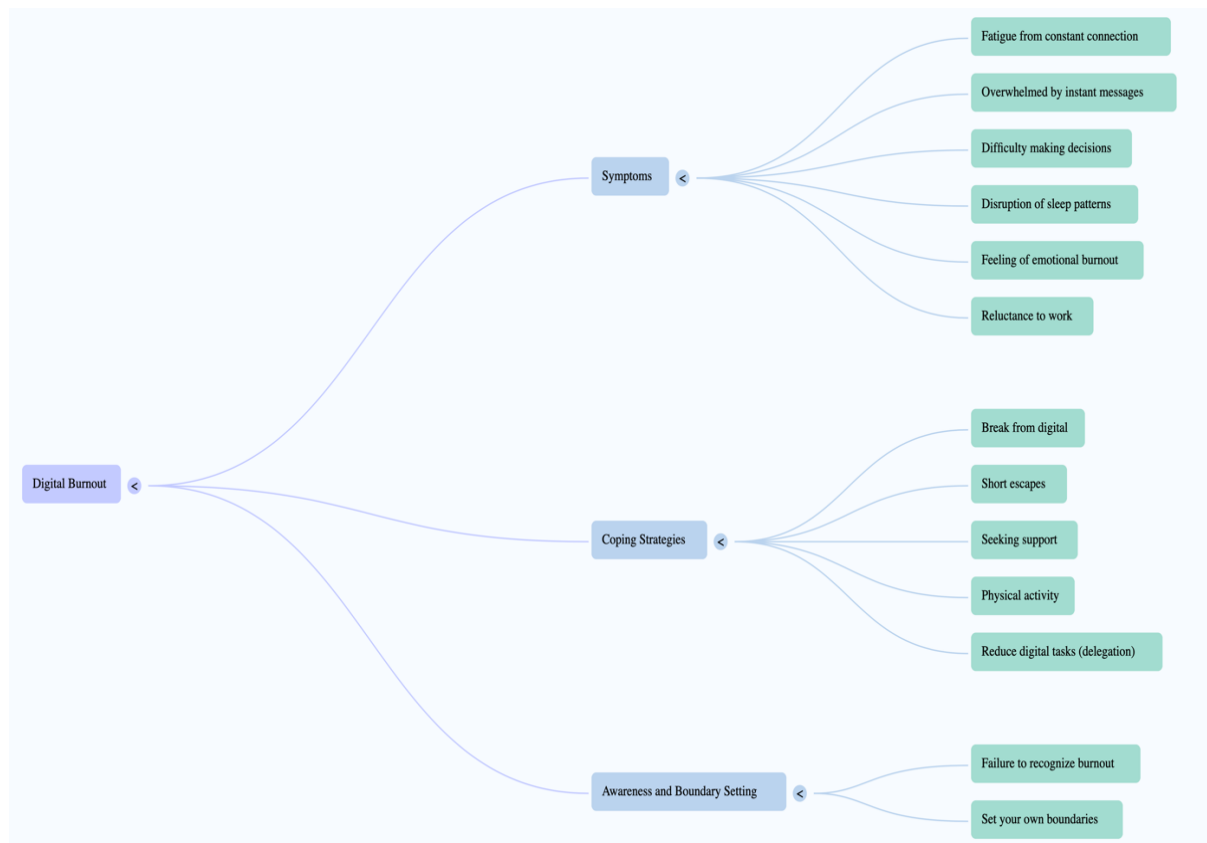


Figure 5. *Categories and Codes Derived from the Theme of Digital Burnout*

As illustrated in Figure 5, school administrators' experiences of digital burnout are grouped under three main categories. The first category, "Symptoms", focuses on the physical, cognitive, and emotional indicators of digital burnout. The codes associated with this category include *"Fatigue from constant connection"*, *"Overwhelmed by instant messages"*, *"Difficulty making decisions"*, *"Disruption of sleep patterns"*, *"Feeling of emotional burnout"*, and *"Reluctance to work"*. These findings demonstrate that the obligation to remain constantly connected leads to mental exhaustion, sleep disturbances, and a growing sense of detachment from work among administrators.

The second category, "Coping Strategies", refers to the personal strategies developed by administrators to manage digital burnout. These strategies are represented by codes such as *"Break from digital"*, *"Short escapes"*, *"Seeking support"*, *"Physical activity"*, and *"Reduce digital tasks (delegation)"*. The data show that participants try to reduce the impact of digital overload by taking breaks, engaging in physical activity, and delegating tasks when possible.

The third category, "Awareness and Boundary Setting", relates to administrators' awareness of burnout symptoms and their ability to establish personal limits. Prominent codes in this category include *"Failure to recognize burnout"* and *"Set your own boundaries"*. The findings indicate that while some administrators struggle to identify the signs of burnout and maintain boundaries in digital spaces, others actively attempt to manage the process by defining personal limits.

Selected excerpts from school administrators' statements related to this theme are provided below.

Participant 6: *“Yes, it happened, teacher. Especially during the pandemic, when everything became online, at some point my head started to hurt. Constantly in front of the screen, constant messages... Sometimes even getting up in the morning was hard. Then I tried to take some time for myself. I started looking at my phone at certain times, I went for a walk, I could say that I cleared my head and got some rest.”*

Participant 8: *“Well, it happened, it happened a lot. Especially towards the end of the semester, I reached the point of explosion with reports, meetings, messages. One day I said, ‘enough’, I put my phone on silent, went out with my family. The next day, I was scolded for messages and calls that I didn’t answer. Then the same tempo starts again.”*

Participant 11: *“Sometimes I was even on the phone at night. I kept getting notifications, someone was asking me something... My brain was about to stop. There were times when I didn’t want to do anything. During those times, I took a few days off, went to the village to see my family, there was no internet reception. It really did me good that time.”*

School administrators were asked the question: “In your opinion, what should be done at the school or education system level, apart from individual efforts, to support digital well-being?” The findings obtained from their responses are presented in Figure 6.

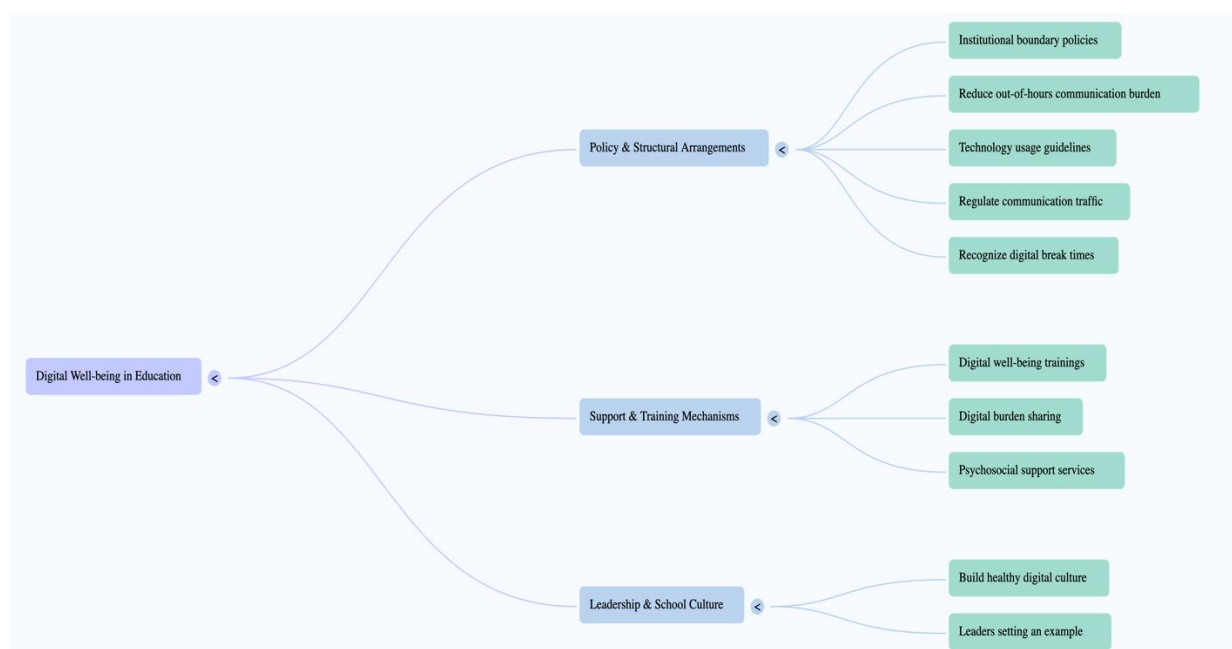


Figure 6. *Categories and Codes Derived from the Theme of Digital Well-Being in Education*

As presented in Figure 6, school administrators' views on promoting digital well-being are grouped under three main categories. The first category, "Policy & Structural Arrangements", includes suggestions emphasizing the need to institutionalize digital well-being at the organizational level. Prominent codes under this category include *"Institutional boundary policies"*, *"Reduce out-of-hours communication burden"*, *"Technology usage guidelines"*, *"Regulate communication traffic"*, and *"Recognize digital break times"*. These findings indicate that in order to prevent digital burnout, it is essential to establish institutional boundary policies, regulate the intensity of communication, and formally recognize digital breaks.

The second category, "Support & Training Mechanisms", focuses on enhancing individual capacities and providing support systems to manage digital workload. Codes in this category include *"Digital well-being trainings"*, *"Digital burden sharing"*, and *"Psychosocial support services"*. Participants emphasized the importance of professional development, task delegation, and access to psychosocial services to strengthen digital well-being.

The third category, "Leadership & School Culture", highlights the direct link between digital well-being and the institutional culture shaped by leadership attitudes. Key codes in this category are *"Build healthy digital culture"* and *"Leaders setting an example"*. The findings suggest that leaders play a critical role in shaping a healthy digital environment by serving as role models and setting boundaries that promote balance.

Selected excerpts from school administrators' statements related to this theme are provided below.

Participant 3: *"So this is not something that can be done with our efforts alone. For example, it would be great if the ministry banned texting after certain hours, or if it is not urgent, it should not be written outside of work hours. Being constantly accessible is exhausting. I think guidance can be provided in schools on this issue, how to set digital boundaries, etc."*

Participant 5: *"I think the school administration needs to set certain rules. For example, there should be no correspondence in teacher groups after the evening, and the duration of meetings should be specified when they will be digital. There is no such thing as everyone being online at all times. A standard should be set from the top, otherwise everyone goes as they please."*

Participant 8: *"When I say digital well-being, the following always comes to mind: this is not just about using technology, there is also a psychological aspect to it. The ministry could perhaps provide in-service training on this issue. How to provide digital balance to principals and teachers, how to manage stress, etc. Sometimes we don't know what to do, to be honest."*

4. Conclusion

This research aimed to deeply understand the effects of digital transformation on the administrative responsibilities and individual well-being of school administrators. The findings revealed that in addition to the conveniences provided by digital technologies in education, school administrators are mentally and physically challenged due to reasons such as constant accessibility, pressure to make quick decisions, increased digital communication load, and blurring of work-private life boundaries. Participants stated that despite the opportunities provided by digital tools, being constantly connected is not a necessity, but a problem that directly affects administrative well-being. The digital environment itself can create stress and anxiety not only in cases of lack of connection, but also due to increased productivity expectations, management of risks related to digital tool use, and rapid change in practices (Moliner et al., 2023). The constant notifications coming from e-mails, instant messaging applications, and other communication channels increase the mental load of school administrators, which makes it difficult to establish healthy boundaries between work and private life.

Digital well-being is not only about avoiding the negativities caused by technology, but also about improving the quality of life of individuals by using digital tools consciously, in a balanced and purposeful manner. At this point, strategies such as setting boundaries, restructuring time management and taking digital breaks play an important role in establishing a healthy balance with digital life. The physiological effects encountered while working with digital tools (e.g. eye strain, posture disorders, carpal tunnel syndrome) are another important dimension that should not be ignored (Moliner et al., 2023). Similarly, constant exposure to digital tools 24/7 has led to digital burnout in teachers, which is characterized by stress, fatigue, desensitization, decreased attention and physical and mental health problems (Erten & Özdemir, 2020).

As a result, school administrators see the constant connectivity brought about by the digital age not only as a technical necessity, but also as a critical issue that directly affects their administrative well-being. The sustainability of digital well-being is possible not only with individual awareness and self-regulation, but also with the existence of institutional support systems and inclusive leadership practices. These findings emphasize that digital well-being should be addressed at both individual and structural levels within the scope of educational leadership and point to the need to develop holistic policy recommendations in this area. Understanding the challenges that school administrators face in the digital world and developing awareness in this area is necessary in order to develop policies and structures that will support digital well-being in the education system. In this direction, ensuring the sustainability of digital well-being with institutional support mechanisms as well as individual strategies will directly contribute to the quality of both administrators and educational environments.

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Exploring EFL Teachers' Technology Acceptance Of The Spatial Metaverse Platform: A Quantitative Study

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Abstract

The integration of metaverse platforms, such as Spatial, into English as a Foreign Language (EFL) education has introduced transformative opportunities for immersive and interactive learning. This quantitative study investigates Turkish EFL teachers' technology acceptance of the Spatial metaverse platform using an extended Technology Acceptance Model. The study examines perceptions across 11 TAM dimensions: perceived usefulness, ease of use, attitude toward use, subjective norms, self-efficacy, facilitating conditions, technological complexity, anxiety, perceived enjoyment, compatibility, and behavioral intention and their influence on overall technology acceptance. Eighteen Turkish EFL teachers (9 women, 9 men, aged 21–33) from secondary and tertiary institutions participated. After attending a webinar on Spatial and using it for the implementation of a lesson, the participants filled up an adapted Technology Acceptance Measure for Teachers. Descriptive statistics indicated a high level of perceived usefulness, compatibility, and behavioral intention but had a low anxiety and technological complexity. Subjective norms and facilitating conditions received moderate scores, implying a lack of institutional support. Overall technology acceptance was average, with large differences among participants. This shows that Spatial for learning is useful and pedagogically sound; however, it is significantly reliant on training in its adoption and on institutional support. The present study contributes to understanding the metaverse into EFL contexts and their efficacious strategies for implementation within educational settings in Türkiye.

Keywords: Metaverse, Spatial platform, Technology Acceptance Model, English as a Foreign Language, immersive learning, virtual reality

1. Introduction

The emergence of the metaverse as an educational tool has significantly transformed how immersive digital platforms are utilized in language learning environments. Among these platforms, Spatial stands out for its potential to enhance learner engagement and interactivity through virtual reality. This transformation is particularly relevant in English as a Foreign Language (EFL) contexts, where immersive tools can replicate real-world communication scenarios. As such, understanding how teachers perceive and adopt these technologies is critical. The Technology Acceptance Model (TAM), which includes constructs such as

perceived ease of use, self-efficacy, attitude toward use, and perceived enjoyment, offers a robust framework to analyze these dynamics.

The recent trends in the educational metaverse are positive with respect to autonomy, engagement, and flexibility in teaching. For instance, new EFL pre-service teachers reported great self-efficacy and a sense of autonomy when designing and participating in metaverse-based classrooms (Hwang & Lee, 2024). In support of this, the application of TAM along with additional psychological and contextual models showed that perceived usefulness, perceived enjoyment, and social influence are among the key variables impacting the intention to use metaverse platforms for education (Wang & Shin, 2022); (Liu & Park, 2024). These results support the idea that the dimensions of TAM are important predictors-and explanations-of the use of metaverse platforms in educational settings.

The impact of metaverse integration into teaching English is becoming a primary educational force with immersive, interactive, and affective environments for learning. Rather than simply digitizing classrooms, the metaverse allows for entirely new experiential dimensions in which learners engage with content in virtual spaces, often beyond the capabilities of physical settings. Empirical studies firmly back this benefit: learners engaged in metaverse platforms reported increased engagement and richer educational experiences than those using traditional platforms like Moodle (Porrás et al., 2024). Virtual scenarios augmented with VR have proved to be more interactive, immersive, and cognitively rewarding for students learning the English language (Guo & Gao, 2022). In parallel to this, many proposed frameworks steer this integration, showing both the pedagogical potential of the metaverse and the technical and ethical hurdles that ought to be navigated (Zhang et al., 2022); (Villalonga-Gómez et al., 2023). However, due to many reasons, one of them being limited hardware access, there are other challenges facing large-scale implementation, among others concerning digital equity and ethics (Kaddoura & Al Hussein, 2023). Once this is overcome, considered pedagogical design and rigorous empirical investigation may lead to a significant realization of the promise afforded by the metaverse to redefine English teaching in a more engaging and inclusive manner.

The increase in the adoption of XR, VR, MR, and the metaverse signifies an increase in the research of their teacher acceptance and readiness in English as a Foreign Language (EFL) education. Recent findings suggest that when EFL pre-service teachers design metaverse-based classrooms, their technological self-efficacy and pedagogical confidence improve significantly, indicating that more acceptance of immersive tools occurs with active creation (Hwang & Lee, 2024). The impact of TPACK and the presence of some infrastructure are nonetheless important; without some professional development and proper pedagogical integration, no physical set-up will support adoption (Thohir et al., 2023). Teacher acceptance of learning through XR differs from accepting online instruction; acceptance of XR is more subtle and dependent on pedagogical skills, as opposed to general perceptions of learning technologies (Ko & Shin, 2023). Practical training opportunities boost the chances of implementing VR tools, according to workshop experiences with Italian high school teachers, where there were high levels of post-training enthusiasm and perceived educational value (Romano et al., 2023). Emotional readiness and curiosity also contribute to acceptance, as many teachers show interest in using the metaverse for task optimization as well as learner engagement, especially if the applications fit educational goals (Vilar et al., 2023). These studies together prove that the successful acceptance of immersive technologies requires pedagogical support, training, and hands-on experience in the classrooms.

Despite these insights, most existing research does not focus specifically on Turkish EFL teachers or the Spatial platform, leaving a contextual and technological gap. Moreover, few studies thoroughly explore the full breadth of TAM dimensions, including facilitating conditions, technological complexity, and anxiety, in a unified model. Addressing this gap is essential to inform educational policy and practical implementation strategies within the Turkish EFL teaching community.

This study therefore poses two research questions: (1) How do Turkish EFL teachers perceive the Spatial metaverse platform across the TAM dimensions, namely, ease of use, attitude toward use, subjective norms, self-efficacy, facilitating conditions, technological complexity, anxiety, perceived enjoyment, and compatibility? and (2) To what extent do those perceptions translate into overall technology acceptance and behavioral intention to integrate Spatial into their own teaching practice?

2. Method

2.1. Participants

18 Turkish EFL teachers (9 women, 9 men) from a mix of secondary and tertiary contexts volunteered for this study. They ranged in age from 21 to 33 years ($M = 23.61$, $SD = 3.87$) and reported moderate-to-high Technological Pedagogical Content Knowledge ($M = 3.56$, $SD = 1.04$ on a five-point scale). All participants had prior experience with digital learning environments, although four of them had explored immersive or metaverse-based tools before.

2.2. Instrument

We used the Technology Acceptance Measure for Teachers (T-TAM; Ursavaş et al., 2014), slightly adapted to refer specifically to Spatial, a metaverse platform. The scale comprises 11 subdimensions: perceived usefulness, perceived ease of use, attitude toward use, subjective norms, self-efficacy, facilitating conditions, technological complexity, anxiety, perceived enjoyment, compatibility, and behavioral intention where each measured with multiple items on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree).

2.3. Procedure

An invitation and informed-consent form were emailed to relevant teacher groups, the teachers are given a 40-min webinar on the use of Spatial.io as a metaverse platform for teaching and learning. Next, they were asked to design and implement one lesson using Spatial metaverse into their class. After all teachers reported completing the metaverse lesson, data collection started and remained open for three weeks in March 2025. Teachers completed a brief demographic section, followed by all T-TAM items via an online survey. No incentives were offered.

2.4. Data Analysis

We exported responses into SPSS 27 for cleaning and analysis. First, we screened for completeness and outliers; all 18 responses were retained. Next, we calculated Cronbach's alpha for whole T-TAM subscale, which resulted in $\alpha \geq .93$ which was excellent. Finally, we derived descriptive statistics (means, standard deviations) for each dimension to paint a full picture of teachers' acceptance levels.

3. Findings

Descriptive statistics for each T-TAM dimension are summarized in Table 2. Overall, teachers perceived Spatial as useful, enjoyable, and well aligned with their teaching practices, while reporting low anxiety and manageable complexity.

Table 2

Descriptive Statistics for T-TAM Subscales (N = 18)

Subscale	M	SD
Perceived Usefulness	4.12	0.66
Perceived Ease of Use	3.82	0.85
Attitude Toward Use	4.00	0.74
Subjective Norms	3.65	0.97
Self-Efficacy	3.90	0.91
Facilitating Conditions	3.50	0.88
Technological Complexity	2.74	0.92
Anxiety	2.58	0.83
Perceived Enjoyment	3.98	0.68
Compatibility	4.05	0.72
Behavioral Intention	4.05	0.71

Inspecting Table 2, perceived usefulness emerged highest ($M = 4.12$, $SD = 0.66$), indicating that teachers firmly believe in the platform's potential to enhance their instructional performance. Behavioral intention and compatibility also scored strongly (both $M = 4.05$), underscoring a genuine willingness to integrate Spatial into upcoming lessons and a clear sense that it meshes well with existing pedagogical routines.

Perceived ease of use ($M = 3.82$, $SD = 0.85$) and perceived enjoyment ($M = 3.98$, $SD = 0.68$) further highlight generally positive experiences with the interface, though some minor navigational challenges lingered. Correspondingly, technological complexity remained relatively low ($M = 2.74$, $SD = 0.92$) and anxiety modest ($M = 2.58$, $SD = 0.83$), suggesting that the majority felt comfortable exploring Spatial's features.

Subjective norms ($M = 3.65$, $SD = 0.97$) and facilitating conditions ($M = 3.50$, $SD = 0.88$) hovered just above the scale midpoint, pointing to moderate social encouragement and institutional support, but also hinting at opportunities for more robust training and resources. Next, overall technology acceptance was measured. The results were given in Table 2. the

Table 2

Descriptive Statistics for Overall Technology Acceptance (N = 18)

Measure	M	SD	Min	Max
Overall Technology Acceptance	2.82	0.84	1.13	4.00

As seen in Table 2, the average acceptance score of 2.82 sits just above the midpoint of the 1–5 scale, indicating a moderate level of enthusiasm for the Spatial platform. Variation is considerable ($SD = 0.84$), with some teachers scoring as low as 1.13 reflecting clear reservations while others reached up to 4.00, showing strong willingness to adopt.

4. Discussion

This study sheds light on the perceptions of educators with regards to Spatial as an educational tool, offering implications around the appropriateness of incorporating it into pedagogies. This study assessed Technology Acceptance Model dimensions which had moderate to very high scores on most constructs. Findings showed high ratings on perceived usefulness, behavioral intention with compatibility, which infers that the teachers see Spatial as a highly effective and pedagogically aligned platform. Hence, these findings corroborate past research, which lays special emphasis on perceived usefulness as the primary driver of any innovative technology adoption by educators, particularly those highly immersive or spatial technologies (Scherer et al., 2019; Teo, 2009; Koutromanos et al., 2014). Basically, enjoyment and ease of use were also, but one of the most important indicators combined with low anxiety and minimized perceived technological complexity.

Nonetheless, these findings are important given that such attributes of complexity and anxiety have previously been recorded in TAM-based studies as deterrents to technology adoption among educators (Teo & Schaik, 2009). Data indicate that Spatial's interface is probably more intuitive and accessible than some previous digital tools. In addition, teachers' positive perceptions may be due in part to their perception of self-efficacy, an established predictor of successful technology integration by teachers in education settings (Chang et al., 2012). However, the scores for subjective norms and facilitating conditions just fell above the scale midpoint, potentially reflecting some resource inadequacies in institutional and peer support systems. Individual motivation does appear strong; however, there are systemic deficiencies (e.g. infrastructure, continuous professional development, and administrative leadership). This supports earlier claims confirming that technology integration effectiveness arises from either teacher readiness or institutional framework (Teo & Zhou, 2017).

The overall technology acceptance score presents a nuanced picture. While many educators express willingness to adopt Spatial, some hesitation persists, likely stemming from personal discomfort with technology or inadequate training. This variability is consistent with longitudinal research indicating that technology acceptance tends to improve with prolonged exposure and structured support (Hu et al., 2003). In summary, although Spatial is well-regarded for its usability and alignment with instructional objectives, its widespread adoption will necessitate targeted professional development and enhanced institutional support. Strengthening subjective norms and facilitating conditions will be essential to transform initial acceptance into sustained classroom integration.

5. Conclusion

This article provided thorough analysis and in-depth examination of Spatial's interoperability for English as a Foreign Language instruction with its advantages and challenges for widespread implementation. The interviewed educators appreciated the ease of use and locomotive features of the platform, many using adjectives such as engaging and probably

exploratory to describe their interaction with the virtual tasks. However, the findings also suggest a gap between individual enthusiasm and institutional backing. Some teachers would have been comfortable to experiment with Spatial on their own, but many expressed reluctance without overt encouragement from administration or formal opportunities for training. This implies that for effective wide-scale Spatial integration to take place, more than just a well-designed interface will be needed: it requires systematized professional development, considerable infrastructure, and a clearly visible commitment from leadership. But the results do elicit a little confidence. Actually, even the different levels of readiness, it did not fail to identify what these educators had in terms of their specific objectives for learning and how Spatial got them enthused about what it would be able to achieve for a classroom enhanced through metaverse. Surely, this should be taken advantage of by key players addressing important facilitating conditions: either peer mentoring or hands-on workshops-can lead to positive subjective norms, probably through showcase events or top management endorsements. Thus, the trajectory would change from cautious experimentation to bold-wide adoption.

This study encompasses many stakeholders. For the classroom practitioner, it is that Spatial increases access to an effective means for EFL instruction. Educators could begin with shorter and more goal-oriented activities-such as a virtual role-play or simulated debate, a co-open conceptual map-and then escalate to extremely complex activities as participants grow more proficient. Actions like co-teaching or peer observation with an experienced user can alleviate fears and build a common repertoire of effective practices. School leaders and administrators bear a critical responsibility in translating pilot enthusiasm into routine practice. Demonstrable commitment, through allocated time for professional development, funding for hardware enhancements, or recognition of innovative applications in performance evaluations, signals that Spatial is a priority rather than a transient initiative. Establishing in-house “technology champions” or dedicated learning technology committees can sustain momentum, address challenges promptly, and disseminate best practices across departments.

For policymakers and curriculum designers, the alignment of immersive tools like Spatial with broader educational objectives warrants consideration. Integrating virtual reality experiences into national or regional standards, particularly in domains such as intercultural communication, 21st-century competencies, or project-based learning, could legitimize these platforms and unlock funding opportunities. Similarly, incorporating metaverse pedagogy into pre-service teacher education programs would equip new educators with the theoretical and practical skills needed to leverage such tools effectively. For researchers, there are several avenues opened up for further inquiry by this study. Longitudinal studies could examine how prolonged engagement with Spatial influences teacher beliefs, self-efficacy, and student outcomes over the duration of an academic year. Mixed-methods studies that combine platform usage data with classroom observations and focus-group interviews may elucidate further the mechanisms underlying successful practices. Comparative studies assessing Spatial against other metaverse platforms could identify specific affordances most conducive to language learning.

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Assessing 21st-Century Technology Literacy Skills Among Turkish High School EFL Teachers

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Abstract

This study investigates the 21st-century technology literacy skills of 13 EFL (English as a Foreign Language) teachers. The research aims to evaluate the participants' ability to comprehend, utilize, and maintain focus while interacting with technology in educational contexts. A quantitative research design is used, incorporating scales that measure three essential dimensions of technology literacy: understanding technology, effectively using technology, and sustaining attention during technological interactions. Participants complete a structured questionnaire to assess their proficiency and attitudes toward integrating technology into teaching practices. The data collected is analyzed using SPSS 27, employing descriptive statistics to summarize the findings and inferential analyses to explore relationships between variables, such as teaching experience and technology skills. The results aim to shed light on the readiness of EFL teachers to adapt to the demands of technology-driven education in the 21st century. The study identifies strengths and areas requiring further development in technology literacy, offering practical suggestions for enhancing teacher training programs. By addressing these competencies, the research contributes to improving the integration of technology in language education, fostering innovative and engaging teaching strategies that meet the needs of learners in an increasingly digital world.

Keywords: technology literacy, 21st century skills, Turkish EFL, high school, teachers

1. Introduction

In the evolving landscape of 21st-century education, EFL (English as a Foreign Language) teachers are increasingly expected to integrate technology effectively into their pedagogy. The Technological Pedagogical Content Knowledge (TPACK) framework, comprising seven knowledge domains—Technological Knowledge (TK), Pedagogical Knowledge (PK), Content Knowledge (CK), Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), and Technological Pedagogical Content Knowledge (TPACK)—offers a comprehensive structure for evaluating teachers' capacity to blend these elements for enhanced instruction. Numerous studies have found that EFL teachers generally report higher confidence in TK and PK, but often rate their TPCK and TCK skills lower, indicating a gap in fully integrating technological tools with content and pedagogy (Susanti et al., 2023), (Quyen, 2022), (Ningtyas et al., 2023). These disparities are critical when viewed through the lens of 21st-century competencies, which prioritize critical thinking, collaboration, creativity, and communication.

Another key dimension influencing TPACK competency is teaching experience. Research consistently shows a positive correlation between years of teaching and higher self-efficacy in TPACK domains, especially when supplemented with targeted professional development programs (Lailiyah, 2017), (Antony et al., 2019), (Purba et al., 2023). Experienced teachers are often more adept at aligning

technological tools with pedagogical goals and content needs. However, even seasoned educators may struggle with integrating newer digital tools unless given structured opportunities for growth (Jamila & Basya, 2024). Identifying which TPACK components teachers excel in, and which remain underdeveloped, is crucial for designing effective professional development that strengthens weaker areas while leveraging existing strengths. This targeted approach ensures that EFL instruction remains aligned with global educational goals and the demands of modern learners.

1.1. TPACK

The integration of the Technological Pedagogical Content Knowledge (TPACK) framework into English language teaching has proven to be a transformative approach in preparing educators for the demands of 21st-century classrooms. Research conducted in various educational contexts reveals that EFL teachers develop TPACK through active engagement in dynamic learning systems and digital platforms. In China, for instance, college-level EFL teachers enhanced their TPACK by interacting within and across multiple online teaching systems, emphasizing that TPACK growth is not static but shaped by cultural, social, and technological factors (Chen, Li, & Xu, 2022). Complementing this view, a study in Thailand demonstrated that technology-enhanced content and language-integrated learning (T-CLIL) significantly improved preservice teachers' TPACK by fostering both content mastery and digital fluency (Adipat, 2021). These findings suggest that contextual and practice-based approaches are essential in building effective TPACK among English language educators.

Beyond development, the application and impact of TPACK in teaching English have also been widely examined. A study from Taiwan explored the synergy between TPACK and second language acquisition (SLA), revealing that using tools like chatbots and image-based exercises supported grammar, vocabulary, and interpersonal communication, thus enhancing student interaction in the EFL classroom (Tseng, 2018). Meanwhile, Indonesian teachers demonstrated that their beliefs about TPACK were largely aligned with their classroom practices during remote teaching of writing, although the study stressed the need for structured professional training to reinforce this alignment (Aniq, Drajiati, & Fauziati, 2022). In another study, a validated TPACK assessment scale revealed that EFL teachers often felt less confident in teaching higher-order thinking skills, underscoring the importance of targeted support for digital pedagogy (Wang, 2022). Collectively, these studies highlight that while TPACK offers a powerful lens for enhancing English teaching, its success depends on sustained, context-sensitive teacher development and systemic support.

1.2. 21st Century Skills

Incorporating 21st century skills into English language learning has become a global priority, with educators and researchers emphasizing the importance of preparing students for a complex, interconnected world. Research shows that English Language Teaching (ELT) students and teachers value skills such as communication, collaboration, creativity, and critical thinking as essential for modern learners (Feyza & Seyda, 2023). Technology plays a pivotal role in facilitating these skills. For example, tools like Google Docs and Facebook are widely used in technology-supported language learning environments to enhance student motivation, engagement, and confidence, while also supporting collaboration and communication (Shadiev & Wang, 2022). Additionally, frameworks such as Technological Pedagogical Content Knowledge (TPACK) help English as a Foreign Language (EFL) teachers assess and strengthen their ability to integrate technology and higher-order thinking into their teaching practices (Wang, 2022).

Beyond digital tools, instructional design that includes scaffolded academic conversations and blended learning environments has shown to be effective in developing 21st century competencies among diverse learners. For example, structured speaking and listening activities support students with disabilities in achieving communication standards, especially when learning English as an additional language (Spies & Xu, 2018). Teachers' beliefs and readiness to adapt are also critical; educators who

embrace interdisciplinary and digitally literate teaching approaches are better positioned to cultivate these competencies in their classrooms (Salman & Inbar-Lourie, 2023). Moreover, English language courses in higher education have been shown to support transversal skills such as civic literacy, cultural sensitivity, and digital competence, making them instrumental in preparing students for global workforce demands (Jaganathan et al., 2014). These findings collectively highlight the multifaceted role of English education in equipping learners with the skills necessary for success in the 21st century.

1.3. The Gap and the Present Study

Despite the growing body of research highlighting the benefits of TPACK in English language education and its role in promoting 21st century skills, several gaps remain. Existing studies primarily focus on either the development of TPACK in isolated teacher education contexts or the effectiveness of specific digital tools in enhancing student engagement. However, there is limited research that holistically examines how TPACK can be purposefully leveraged to foster a full spectrum of 21st century competencies—such as creativity, critical thinking, collaboration, and digital literacy—within English language classrooms. Furthermore, while frameworks and teacher beliefs are acknowledged as important, few studies explore how these elements interact within actual teaching practices to shape learner outcomes across diverse educational and cultural settings.

This present study aims to bridge this gap by investigating how EFL teachers implement TPACK-informed strategies to cultivate 21st century skills in their students, with an emphasis on real-world teaching contexts. It seeks to understand not only the tools and approaches teachers use, but also how their pedagogical decisions, institutional environments, and professional development experiences influence the integration of TPACK in meaningful and sustainable ways. By addressing this underexplored intersection, the study contributes to a deeper understanding of the practical and systemic conditions that support the alignment of technology, pedagogy, and content in preparing learners for the demands of the modern world.

1. What are the current levels of EFL teachers' technology literacy skills as reflected in their scores on the seven TPACK constructs (Technological Knowledge, Pedagogical Knowledge, Content Knowledge, PCK, TPK, TCK and TPACK integration) within the scope of 21st century skills?
2. How does years of teaching experience relate to these technology-literacy dimensions (each TPACK subscale and the overall TPACK score) within the scope of 21st century skills?
3. Which TPACK components do teachers rate most highly and which least highly, pointing to clear strengths and potential areas for targeted professional development within the scope of 21st century skills?

2. Method

2.1. Participants

Thirteen Turkish high-school EFL teachers (10 female, 3 male) took part in the study. Their teaching experience ranged from 3 to 28 years ($M = 11.7$, $SD = 6.8$). All held at least a bachelor's degree in English Language Teaching or a related field, and they were recruited via convenience sampling from public schools in the İstanbul metropolitan area. Prior to data collection, ethical approval was secured from Ondokuz Mayıs University's Institutional Review Board (IRB no. 2024-EFL-019), and written informed consent was obtained from each participant.

2.2. Instrument

We employed a Turkish-adapted version of the Technological Pedagogical Content Knowledge (TPACK) questionnaire developed by Schmidt et al. (2009) and extended by Koh, Chai, and Tsai (2013). The final instrument comprised 36 items across seven subscales: Pedagogical Knowledge (PK), Technological Knowledge (TK), Content Knowledge (CK), Pedagogical–Content Knowledge (PCK), Technological–Pedagogical Knowledge (TPK), Technological–Content Knowledge (TCK), and Technological–Pedagogical–Content Integration (TPCK). Participants rated each statement on a 6-point Likert scale (1 = “Strongly disagree” to 6 = “Strongly agree”). In our sample, internal consistency (Cronbach’s α) ranged from .79 (TCK) to .85 (TK), with an overall α of .91.

2.3. Procedure

Data were gathered in March 2025 via an online survey administered through Google Forms. Teachers completed the questionnaire at their convenience within a two-week window. Responses were exported to SPSS 27 for analysis.

2.4. Data Analysis

After screening for missing values (none) and confirming univariate normality using Shapiro–Wilk tests (all $p > .10$), we ran descriptive statistics (means, standard deviations) for each TPACK construct. To explore how teaching experience related to technology-literacy dimensions, Pearson’s correlation coefficients were calculated for years of experience versus each subscale and the overall TPACK score. The significance threshold was set at $\alpha = .05$.

3. Findings

Descriptive statistics are summarized in Table 1. In particular, participants rated their Pedagogical Knowledge highest ($M = 5.22$, $SD = 0.55$), suggesting confidence in their instructional design abilities. Content Knowledge registered the lowest mean ($M = 3.46$, $SD = 0.65$), pointing to potential gaps in subject-matter integration. The composite TPACK score fell in the moderately high range ($M = 4.26$, $SD = 0.44$), indicating overall readiness to blend technology with pedagogy and content.

Table 1
Descriptive Statistics for TPACK Constructs (N = 13)

Construct	M	SD	α
Pedagogical Knowledge (PK)	5.22	0.55	.82
Technological Knowledge (TK)	4.31	0.59	.85
Content Knowledge (CK)	3.46	0.65	.80
Pedagogical–Content Knowledge (PCK)	4.32	0.55	.83
Technological–Pedagogical Knowledge (TPK)	5.03	0.58	.81
Technological–Content Knowledge (TCK)	3.52	0.70	.79
TPCK Integration	3.95	0.71	.84
Overall TPACK	4.26	0.44	.91

Pearson’s correlations between years of teaching experience and technology-literacy dimensions appear in Table 2. Of note, experience was significantly associated with Technological Knowledge ($r =$

.58, $p = .034$) and with the overall TPACK composite ($r = .52$, $p = .049$). No other subscale reached statistical significance, though PCK and TPK trended positively ($r \approx .45$, $p \approx .10$), suggesting that more seasoned teachers may leverage pedagogical–technological interactions to some extent.

Table 2

Pearson Correlations: Teaching Experience and TPACK Constructs

Construct	r	p
Technological Knowledge (TK)	.58	.034*
Overall TPACK	.52	.049*
Pedagogical Knowledge (PK)	.28	.36
Content Knowledge (CK)	.21	.48
Pedagogical–Content (PCK)	.45	.11
Technological–Pedagogical	.47	.09
Technological–Content (TCK)	.30	.32
TPCK Integration	.33	.29

* $p < .05$

These results underscore that, in particular, teachers’ familiarity with technology itself (TK) grows with experience. At the same time, other integration skills appear less tied to tenure, hinting that professional development should target content–technology blending and deeper TPCK strategies across all career stages.

4. Discussion, Conclusion and Suggestions

The findings of this study offer valuable insights into the technology literacy skills of Turkish high school EFL teachers, evaluated through the Technological Pedagogical Content Knowledge (TPACK) framework. With a modest sample of 13 participants, the results reveal a spectrum of proficiency across the seven TPACK constructs, shedding light on both strengths and challenges in the context of 21st-century education. Notably, the highest mean score in Pedagogical Knowledge (PK) ($M = 5.22$, $SD = 0.55$) underscores these teachers’ confidence in instructional design and teaching strategies. This strength aligns with Feyza and Seyda (2023), who argue that communication and collaboration skills—central to pedagogical expertise—are critical in modern EFL instruction. Conversely, Content Knowledge (CK) scored the lowest ($M = 3.46$, $SD = 0.65$), indicating difficulties in merging English language content with technology. This echoes Ningtyas et al. (2023), who found that EFL teachers often struggle to adapt linguistic elements like grammar or vocabulary to digital platforms, a skill essential for fostering digital literacy among students. The overall TPACK score ($M = 4.26$, $SD = 0.44$) suggests a moderate level of readiness to integrate technology, pedagogy, and content, a capability vital for cultivating 21st-century skills such as creativity and critical thinking (Feyza & Seyda, 2023). However, weaker scores in Technological–Content Knowledge (TCK) ($M = 3.52$, $SD = 0.70$) and TPCK Integration ($M = 3.95$, $SD = 0.71$) point to uneven integration, potentially limiting innovative lesson design. This finding is consistent with Susanti et al. (2023), who noted similar challenges in achieving seamless TPACK synthesis among EFL educators.

A key observation is the positive correlation between teaching experience and Technological Knowledge (TK) ($r = .58$, $p = .034$), as well as the overall TPACK score ($r = .52$, $p = .049$). This suggests that veteran teachers, through prolonged exposure to digital tools, develop greater technological comfort, a trend supported by Lailiyah (2017). Yet, the lack of significant correlations with TCK ($r = .30$, $p = .32$) and TPCK Integration ($r = .33$, $p = .29$) indicates that experience alone does not guarantee proficiency in content-specific technology use or full TPACK integration. Jamila and Basya (2024) similarly found that seasoned teachers may falter with newer tools without structured training. Trends in Pedagogical-Content Knowledge (PCK) ($r = .45$, $p = .11$) and Technological-Pedagogical Knowledge (TPK) ($r = .47$, $p = .09$) hint at improvement with experience, though the small sample size likely constrained statistical significance. These results underscore the need for targeted support beyond mere tenure, a point reinforced by Chen, Li, and Xu (2022), who highlight the role of dynamic learning systems in bolstering TPACK competencies. Additionally, Shadiev and Wang (2022) emphasize that technology enhances student motivation and engagement, suggesting that improving teachers' TCK and TPCK could amplify classroom impact.

This study illuminates the technology literacy landscape among Turkish high school EFL teachers, revealing a strong foundation in Pedagogical Knowledge but persistent gaps in Content Knowledge and its technological integration. The moderately high overall TPACK score reflects a promising capacity to incorporate digital tools into EFL instruction, yet deficiencies in TCK and TPCK Integration signal incomplete synthesis of technology, pedagogy, and content. Experience significantly boosts Technological Knowledge and overall TPACK proficiency, indicating that seasoned teachers are better equipped to handle technology—a finding consistent with Lailiyah (2017). However, the absence of strong correlations with other subscales suggests that mastering content-technology integration requires more than years on the job. Adipat (2021) supports this, demonstrating that technology-enhanced content and language-integrated learning (T-CLIL) can bridge such gaps, emphasizing the need for deliberate training efforts.

These findings highlight the importance of addressing specific TPACK weaknesses to fully equip EFL teachers for 21st-century demands. Enhancing their ability to integrate technology with English content can foster critical skills like digital literacy and collaboration in students, preparing them for a technology-driven world. As Shadiev and Wang (2022) note, effective technology use boosts student engagement, making it imperative to strengthen teachers' TPACK skills. Chen, Li, and Xu (2022) further reinforce this by advocating for dynamic, adaptive learning systems to support TPACK development, suggesting a path forward for improving educational outcomes in this context.

Suggestions & Practical Implications

Drawing on the study's findings and the broader literature, several actionable strategies emerge to enhance the technology literacy skills of Turkish high school EFL teachers. First, targeted professional development programs should focus on integrating technology with English content, offering practical training with tools like language apps (e.g., Duolingo) and multimedia platforms. These programs should prioritize TCK and TPCK Integration, addressing the identified weaknesses. Wang (2022) underscores the need for such support, noting EFL teachers' struggles with higher-order thinking skills in digital contexts. Second, mentorship initiatives pairing experienced teachers—those with higher TK and TPACK scores—with novices could accelerate skill-sharing, particularly in TPK and TPCK. Aniq, Drajati, and Fauziati (2022) advocate for such structured training to bolster teachers' confidence in technology use.

Third, curriculum integration in teacher education should embed TPACK-focused modules into pre-service programs, ensuring new teachers enter the field adept at blending technology with content. Tseng (2018) highlights the efficacy of tools like chatbots and image-based exercises in language

instruction, offering a model for early training. Finally, future research should expand the sample size beyond 13 participants and incorporate qualitative methods like interviews to explore teachers' challenges in depth. Investigating specific tools' impact on student outcomes and the role of institutional support, as suggested by Chen, Li, and Xu (2022), could refine these recommendations further. Implementing these strategies can empower EFL teachers to create dynamic, technology-rich classrooms, aligning with 21st-century goals and enhancing student readiness for a global society, as emphasized by Jaganathan et al. (2014) in their focus on transversal skills.

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