ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
JALT

ASSESSING THE IMPACT OF DIGITAL PERSONALIZATION IN TESOL: A COMPREHENSIVE REVIEW OF LEARNER PERFORMANCE AND PEDAGOGICAL PRACTICES

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Abstract
This paper systematically examines the integration of digital technologies in TESOL classrooms, with particular emphasis on tailoring instructional practices to meet individual learner needs and evaluating their impact on student outcomes. The study aims to explore how technology-enhanced personalized learning supports learners in achieving academic language proficiency goals. Specifically, it investigates whether digital tools and personalized instructional approaches enhance student engagement and language competence across the four core skills of English: reading, listening, writing, and speaking. The research begins with a comprehensive review of existing literature, tracing the evolution of digitalization in educational contexts and its influence on second language acquisition. It examines how technological innovations have become instrumental in facilitating personalized learning experiences that address diverse learner profiles, thereby fostering increased motivation and engagement. The central research question focuses on whether personalized learning approaches, supported by digital technologies, improve classroom engagement and retention, and how educators can effectively implement such strategies within TESOL environments. The study further analyzes the interrelationship between digital technology integration and personalized instruction, evaluating their combined impact on learner performance and engagement. Relying primarily on secondary research, the paper conducts an extensive synthesis of scholarly literature, policy documents, and empirical studies to identify effective strategies for implementing individualized educational plans within TESOL settings. Insights from educational leaders and practitioners are also incorporated to reinforce the findings derived from literature. The review indicates that adaptive learning technologies and research-informed pedagogical frameworks significantly enhance student participation and language development. Based on these findings, the study offers practical recommendations for educators, emphasizing coherent integration of personalized instructional strategies to optimize teaching effectiveness. By contributing to the growing body of research on personalized learning in language education, this study underscores the transformative potential of digitally mediated instruction. Ultimately, it seeks to inform future TESOL practices and related educational fields by advocating for structured personalized learning frameworks supported by digital innovation.

Keywords: *Digital, Impact, Learner, Personalization, TESOL,*

1. Introduction

This study examines the integration of digital technologies within TESOL (Teaching English to Speakers of Other Languages) classrooms, with particular emphasis on personalized learning and

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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its influence on language acquisition across diverse age groups. The increasing reliance on technology in contemporary society has significantly reshaped educational practices. The COVID-19 pandemic further accelerated this transformation, as digital tools became essential for maintaining professional, social, and educational continuity. During widespread school closures in 2020, technology enabled students worldwide to continue their studies remotely, regardless of geographical constraints.

The normalization of online and distance learning has persisted beyond the pandemic. Today, distance education programs are widely recognized and valued by employers, often regarded as equivalent to traditional classroom-based qualifications. Numerous globally accredited universities and institutions now offer flexible online programs to address the evolving academic needs of learners in a digitally advancing world. According to a Forbes survey, 93% of respondents reported a positive return on investment from online education, indicating favorable academic and professional outcomes (Calonia, 2024). These developments reflect the growing institutional acceptance and credibility of digitally mediated learning environments.

The integration of technology into education has substantially influenced classroom practices across disciplines, including mathematics, sciences, and English language teaching. Over recent decades, English has increasingly established itself as a global lingua franca (Rao, 2019), leading to a surge in learners seeking proficiency in the language. In response, contemporary TESOL classrooms have adopted innovative instructional approaches that incorporate digital tools to enhance pedagogical effectiveness. Digital platforms facilitate the development of core communication skills—reading, listening, writing, and speaking—through interactive and multimodal learning experiences (Pazilah, Hashim, & Yunus, 2019).

For educators teaching English as a foreign language (EFL), technological tools offer opportunities to accommodate diverse learner needs. Digital devices can support low-performing students, learners with disabilities, and high-achieving students by providing differentiated instruction and adaptable content (Alshahrani, 2017). Modern classroom technologies—including interactive presentation software, smart boards, computer-assisted language learning systems, and multimedia resources—enable instructors to present material in engaging and accessible ways that promote comprehension and skill development (Alshahrani, 2017).

Beyond general technology integration, personalized learning has emerged as a significant pedagogical approach within digitally enhanced environments. Personalized learning leverages adaptive technologies and data-driven insights to tailor instruction according to individual learner preferences, proficiency levels, and learning trajectories. In the context of TESOL, such approaches have the potential to strengthen linguistic acquisition, enhance student engagement, and improve overall learning outcomes.

Research Aim and Objectives

The primary aim of this study is to evaluate the impact of technology integration in TESOL classrooms, particularly focusing on personalized learning strategies and their influence on language acquisition and student outcomes. The study seeks to analyze how digitally supported personalized instruction contributes to learner engagement and linguistic development.

Research Questions

The study is guided by the following research questions:

1. Does the integration of personalization technologies in TESOL classrooms positively influence students' English language learning outcomes?

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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2. What effect does personalized learning have on classroom engagement, and how can educators effectively implement personalized methodologies to improve retention and academic performance?
3. What is the relationship between technology integration and personalized learning in TESOL contexts?

Significance of the Study

Over the past few decades, the integration of technology has expanded significantly across various sectors, including education. In TESOL classrooms, digital tools are increasingly utilized to enhance instructional practices and support language acquisition. Although existing research has examined the general impact of technology integration in language education, comparatively limited attention has been given to understanding how personalized learning approaches, supported by digital technologies, influence student achievement and educational outcomes. This study addresses that gap by synthesizing existing scholarly literature and incorporating primary data collected through interviews. By examining the intersection of digital integration and personalized instruction within TESOL settings, the research seeks to provide a more comprehensive understanding of how technology-mediated personalization affects learner engagement, retention, and language development. The findings of this study are expected to contribute to the advancement of teaching practices and inform educational policy development. Furthermore, the research offers practical insights into the effective implementation of technology-enhanced personalized learning strategies, ultimately supporting improved student outcomes in TESOL contexts.

2. Literature Review

General Role of Technology in Education

Technology has transformed the way we interact, live, and work with each other, making it more convenient to connect with people globally (Subasaranya & Saranya, 2024). It has also revolutionized the educator sector, emerging as a positive influence for innovation in educators, providing educators with the opportunity to implement personalized learning pedagogies that accommodate varied learning needs through digital platforms, interactive tools, and multimedia materials, that have inspired problem-solving abilities, student participation and critical thinking, making information readily available not just in the four walls of a classroom (Kalyani, 2024).The Internet is a prominent result of technology integration and over the past few years, it has developed exponentially. Despite its numerous drawbacks, the application of the internet has provided students with the opportunity to find educational tutorials related to their lesson and while strengthening their learning experience (Raja & Nagasubramani, 2018). Research has highlighted that students are more engaged in a lesson where information and communications technology is implemented (Beauchamp & Kennewell, 2010; Chaudhary & Sharma, 2012; Serow & Callingham, 2011). A positive impact of technology is that it strengthens both learning and teaching experience through digital developments like 3D visualization tools, digital cameras, computers, mind-training softwares and more, serving as helpful tools for students to comprehend educational concepts conveniently through visual learning, making it easy for educators to make the lessons more interactive (Raja & Nagasubramani, 2018).

Technology in TESOL Classrooms

Due to the increase in globalization, English has become a crucial aspect of everyone's life (Rao, 2019). Due to its growing relevance, TESOL has emerged as a crucial element in the educational

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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sector. However, teaching English to speakers of other languages or to non-native speakers unveils its obstacles (Chen et al., 2023).For TESOL practitioners, technology provides them a channel through which they can enhance and modify teaching and language acquisition methodologies for English Language Learners. It can serve as a link that associates the students' existing knowledge and the linguistic capabilities educators want them to attain, through various technological tools such as: web-based assignments on traditional courses, powerpoint presentations, smartboard technology, electronic portfolio assessment system, tape recording tutoring, and translation applications (Honigsfeld, Giouroukakis, Cohan & Walsh, 2009). The rapid development of science and technology has provided numerous technological tools to facilitate English language teaching. Among these tools are online English language learning websites, electronic dictionaries, computer assisted language learning programs, presentation softwares, various chatting and email messaging programs, Listening CD players, numerous YouTube and other video clips, virtual conferences, language enhancing 3D virtual world programs, course management softwares like Blackboard, Web CT etc., mobile assisted language learning (MALL) and so on.

Digital Tools of English Teaching

The progressive advancement of science and technology has brought multiple digital tools to streamline the English Language Teaching journey for both learners and teachers. Some other effective tools are digital English language learning websites, CD players, video streaming platforms such as Youtube, mobile assisted language learning (MALL), 3D virtual reality programmes, language learning software programmes, etc. (Hazarika, 2017).

The Significance of Socio-Cultural Theory

SCT strongly emphasizes the value of interpersonal communication and cultural context in Learning. By SCT, Learning is not only an individual process but also a socially-mediated one in which students collaborate and interact with others to create new information. According to socio-cultural theory, interpersonal communication and cultural context is a crucial aspect of learning English as a second language. Through socio-cultural theory, learning is not just an isolated process, but also a culturally-influenced aspect through which learners coordinate and communicate with others to produce new information (Glăveanu, 2020). In regards to socio-cultural theory, technology can help students from all parts of the world to remain connected, it may also assist in communication and social contact (Enciso, 2020). Learners may have the opportunity to engage in collaborative educational activities and receive guidance from their instructors and peers through video conferences, online forums and other technical tools. Digital technology can also provide learners with natural language materials and resources, such as podcasts, news articles, and films that demonstrate the traditional practices of the target language group (Cunningham, 2023).The application of technology in teaching English to speakers of other languages have become crucial as it has boosted students' self-confidence in learning and using English successfully in everyday contexts (Hwang & Oh, 2021).

Outcomes of Digital Integration in Classrooms

According to a survey, students who used smartphone applications during the classroom performed better academically and demonstrated enhanced academic performance. Furthermore, digital tools implementation allowed students to have an elevated independent learning experience (Pate, Powers, Coffman, & Morton, 2022). In short, information technology adjusts the relationship between TESOL and expanded self-confidence. It depicts that

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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incorporating digital technology into TESOL lessons makes independent learningmore engaging, increasing student engagement and motivation. Ulla, Perales, and Tarrayo's (2020) qualitative study on the integration of the digital applications in TESOL environments revealed that instructors found it easier to engage students and enhance their active involvement in language acquisition, encouraging self-learning amongst students through applications such as Google Forms, Kahoot, Socrative, Facebook, Quizizz, Facebook, YouTube, Quizlet (Chanani & Al Ahmed, 2023).

Incorporation of Gamification in ESL Classrooms

The use of gamification in improving ESL students' linguistic capabilities. The application of digital sources to ameliorate English language learning and teaching is called "digital technology" in TESOL context. It encompasses various digital tools, such as online resources, computers, multimedia contents, and mobile devices (Whitelaw, Mamas, Topol, & Van Spall, 2020). Language learners can implement digital technology to access online tools such as interactive vocabulary tests, grammar drills, and media content such as podcasts and films. Digital resources can also aid in the correspondence between students and teachers through discussion forums, video conferencing and social networking platforms (Li, 2020). Digital technology has become a crucial aspect of TESOL for students across various age groups and competencies, providing more effective and engaging educational experience (Al-Khalidi, 2020).

Fulfillment of Academic Goals through Personalized Learning in TESOL Classrooms

The extensive usage of digital technology and electronic devices have made it easy for personalized learning to be implemented in academic environments. Students possess their own knowledge acquisition pace, educational choices, and educational targets that are individualized to their needs. Research has shown a strong relationship between student's drop-out rate and incorporating personalized learning (Herawati, 2023).Personalized learning is in demand (Huang et al., 2012) due to new technologies involving big data and learning analytics. It should be tailored to and continuously modified to an individual learner's conditions, abilities, preferences, background knowledge, interests, and goals and adaptable to the learner's evolving skills and knowledge (Huang et al., 2012).

Integrating Technology in Education

Integrating Technology in Education could mean numerous things. Particularly, it is used for enhancing the educational experiences of students through employing various digital devices in a TESOL classroom. Additionally, virtual classrooms also significantly assist students to succeed in their learning objectives. Some digital aspects incorporated in classrooms include powerpoints and games, internet homework assignments, classroom tablets, and online grading systems which are known to keep the students engaged, and assist their various learning styles (Drexel University School of Education, n.d.)Critical thinking and problem solving skills can be conveniently learnt through computers as they pave the way towards representing data visually through practical circumstances and distinguish configurations in practical insights, therefore, they elevate the skills for problem solving in the educational process (Zhang, 2020). The core purpose of implementing technology in a classroom is for the educator to teach the students how they can implement technology to learn a new language and acknowledge the factthat technology will not do the student's work and replace the human mind. Rather, it would only amplify it. Therefore, educators play a crucial role in assisting students in accelerating their learning process, rather than hindering it (Ranasinghe & Leisher, 2009).

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ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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The Impact of Personalized Learning in TESOL

A Cultural and Technological PerspectiveLearning is a natural human activity that is shaped by personal experiences, cognitive awareness, personal bias, opinions, cultural background, and environment. Learning has been defined as a stable and persistent change in what a person knows and can do. Learning is formed through an individual's interactions, including the conveyance of knowledge and skills from others and experiences. Not all learners are the same. All students learn differently. An individual's learning capabilities and their understanding of the world is shaped through their individual cultural influences and experiences. Learners deliver their cultural practices in the classroom environment. Culture is crucial not just for what people learn, but also for how they learn (San Diego County Office of Education, n.d.).Moreover, a student's perspectives, understanding, knowledge and skills are expanded through the personalized experience of learning. Therefore, individual goals and needs can be met through implementing learning models, particularly in English language learning (Rahmanipur, Shokri & Heidarnia, 2025). Personalized learning has survived for many years in the past few years as a form of mentoring and apprenticing people of all age groups (Shemshak & Spector, 2020). Personalized learning is an educational strategy that customizes instructional approaches, content, and learning momentum to fulfill the distinct needs of individual learners. In TESOL (Teaching English to Speakers of Other Languages), personalized learning approaches are progressively being incorporated with digital tools to strengthen languagelearning outcomes, and student engagement (Afzal, Shahzad, & Farooq, 2025). The incorporation of personalized learning strategies in TESOL (Teaching English to Speakers of Other Languages) has been substantially improved by digital advancements. Research suggests that versatile learning frameworks, artificial intelligence (AI) enhanced coaching, and multi-modal learning approaches enhance student engagement and educational results (Chapelle, 2016). In TESOL, personalized learning is embedded in the sociocultural and constructivist theories, where students dynamically build upon their existing knowledge through interactive, and differentiated instruction. (Vygotsky, 1978).One of the most extensively executed approaches is the implementation of adaptive technological applications, such as Babbel, Duolingo, and AI-driven language educators, which customize lesson complexity based on consumer productivity (Godwin-Jones, 2018).Studies demonstrate that machine learning algorithms streamline vocabulary learning and grammatical precision through spaced repetition systems (SRS) (Petersen et al., 2021). Furthermore, flipped learning models, where learners approach electronic tools before class, enable educators to highlight multilayered linguistic tasks (Bergmann & Sams, 2012). Immersive learning and gamification have also collaborated extensively towardsTESOL pedagogy. Augmented reality (AR) and virtual reality (VR) have contributed to strengthen illustrated language learning by placing learners in simulated realistic situations (Lan et al., 2018). These resources enhance listening skills, pronunciation and cultural expertise, directing towards enhanced overall results (Zhao, 2020). Moreover, AI powered tools and learning insights offer educators with realistic data, give educators instantaneous facts, authorized for tailored intercedes and evolved lessonplans (Siemens, 2013). Despite these developments, obstacles continue in ensuring a fair access to digital tools, teacher preparedness and data privacy concerns. While personalized learning approaches exhibit ameliorated student motivation and linguistic competency, further observed studies are required to evaluate long-term success in TESOL circumstances (Reinders & Benson, 2017). Future research should

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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concentrate on AI-enhanced instruction, collective virtual instruction environment, and the function of thoughtful analysis in preserving independent language learning.

Wilson Reading System : An Example of Personalized Learning

The Wilson Reading System (WRS) epitomizes a personalized learning perspective in an educational setting, specifically for students who have learning disabilities such as dyslexia, or any other language-based disability. The WRS is embedded in the Orton-Gillingham concepts, and it utilizes a progressive, multi-sensory and personalized perspective to literacy expansion. This learning system aligns with the distinguished teaching framework (Tomlinson, 2001). By incorporating phonemic awareness, fluency training and word structure, it harmonized with distinguished educational structure, providing learners with the opportunity to advance at their own progression (Tomlinson, 2001). Technology incorporation has improved WRS efficiency through online platforms like Wilson Academy Online, which provides engaging lesson planning and learner progress tracking (Wilson Language Training, 2020). AI-enhanced resources, such as Lexia Core5 and Fluency Tutor, provide instantaneous guidance. Furthermore, speech-to-text software and gamified phonics applications aid knowledge development by providing compelling, and personalized assistance (Zhao, 2020). These digital innovations make WRS a revolutionized, digitally-supported interference, individualized progression and enhanced educational results.

Personalization Integration in a classroom:

The Future of English Language Learning does personalization and technology integration in classrooms positively impact a student's learning outcomes for English language acquisition? Personalization is a term used by educators as a method of instruction during lectures, tailoring the material in accordance to the learning abilities of each student. Personalized learning increases the student's motivation and interest in grasping content while engaging in the materials prepared by their teachers (Alamri et al., 2019). According to Webster dictionary, to personalize means "to make something individual; specifically: to mark as the property of a particular person." (Merriam-Webster, n.d.).Personalized learning in English language learning has demonstrated to expand student involvement, understanding, and comprehension rates. Studies show that versatile educational technologies, distinguished teaching, and personalized response supports strengthened language expertise (Tomlinson, 2001).Personalized learning in TESOL is rooted in constructivist and sociocultural theories. Both these theories emphasize the learner's dynamic function in knowledge formation and the significance of social communication in linguistic advancement (Vygotsky, 1978; Piaget, 1952). Furthermore, Differentiated Instruction and Universal Design for Learning (UDL) (Tomlinson, 2001), offer theoretical findings for modifying content distribution, teaching methods, and assessments to fulfill the needs of learners' multifaceted backgrounds, proficiency levels and learning styles. Research in Neural research methodologies to language acquisition indicates that cognitive-based modifiable educational models enhance neural efficiency in second language learning by harmonizing with students' analytical abilities and working memory. (Dörnyei, 2019). This cognitive outlook enlightens a hyper-personalized virtual system that modifies lesson progression based on instantaneous cognitive activity analysis.

The Role of Artificial Intelligence in Personalization

Artificial Intelligence has transformed individualized learning in TESOL, accelerating instantaneous modification and personalized feedback. Natural Language Processing chatbots, an

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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example of AI, give engaging, interpreted discussions, which remarkably refine speaking abilities (Godwin-Jones, 2019). Furthermore, it also assists in automated assessment and feedback. AI-enhanced writing feedback for syntax, vocabulary, and grammar. Studies demonstrate a 25% development in student writing competence through the application of artificial intelligence enhanced feedback over a six-month time frame (Siemens, 2013).

Gamification and Immersive Learning: A New Era of TESOL

Engagement Gamification has surfaced as an exceedingly effective personalized learning approach in TESOL. Educators utilize reward systems, game mechanics, and gamified platforms to improve learner engagement and motivation. (Lan et al., 2018). Games can be designed to adapt to individual learning preferences and needs. By providing various levels, rewards, and achievements, gamification provides learners to advance at their own momentum, encouraging a perception of satisfaction and accomplishment (TESOL Australia, 2023).Due to the rapid advancement of Computer-Assisted Language Learning (CALL), researchers and teachers of second language learning have to adapt with the rising pressure to become more digitally oriented, merged with the developing expansion of mobile applications (Godwin-Jones, 2015). With the expansion of technological gadgets and applications, new branches of study have been formed in CALL, including gamification, which is a contemporary pedagogical approach that seems to strengthen learning motivation among both digital immigrants and digital natives. Over the past few years, online educational resources have also expanded both in formal and non-formal education to involve and encourage students throughout the learning process through applications such as Lego education, Minecraft Education, Quest2Learn, andKahoot, which has led to these games being integrated into various educational subjects (Domínguez et al., 2013). There are some examples of gamified personalized learning in TESOL. One such example is learning the English language through Augmented Reality (AR) and Virtual Reality (VR) to create an immersive learning experience for everyone, using VR simulations suchas ImmerseMe, and MondlyVR, which can create realistic interactive situations, directing towards a 47% improvement in verbal fluency (Zhao, 2020. Research has highlighted the positive impact of gamification in a classroom, which has led to enhanced retention rates, specifically in vocabulary learning, by influencing interactional challenges and spaced repetition (Pazilah et al., 2019). Personalized learning experiences offer learners with an extensively tailored educational method. It recommends them with a chance to learn at their own pace, utilizing the processes and materials that are tailored to fulfill the learners' distinctive needs and competencies. By customizing learners' academic experiences, personalized learning experiences can guarantee that students can optimize their competence and construct a robust foundation for their forthcoming studies. Ultimately, this strategy assures a learning experience that is fulfilling and meaningful, because it is personalized in accordance with each learner's needs (Nahas, 2022).

Impact of ChatGPT in Personalized Learning

Recent developments in machine learning have led to a development of AI tools that assist in creating videos, images/graphics, text, and audio. One such example is the use of Generative Pre-trained Transformer (GPT), which has contributed towards creating ChatGPT, developed by OpenAI. ChatGPT is an adaptable device created to optimize computerized conversations and theoretically make human operators repetitious. (Kalla & Smith, 2023). There are particular issues attached with Artificial Intelligence and itsrelation with

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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biased data, environmental effect, digital and environmental disparities, and capitalisation of human labor were brought up as obstacles AI adoption encountered. In short, artificial intelligence should be viewed as a tool for assistance, rather than a complete replacement for educators (Teaching English with Oxford, 2024).ChatGPT can support students in language learning by providing them with the opportunity to engage in collaborative conversations, grammar help, and vocabulary enhancement. It can involve learners in dialogue practice, offer language worksheets, and assistin enhancing their language proficiency through asking feedback on their written work, receive improvement suggestions on their written work and attain an effective understanding of the writing structure. (Mosaiyebzadeh et al., 2023). Over the past few years, the world of technology has experienced exponential changes in the education sector due to technological progressions. Amongst these technologies, one of the most impactful changes has been the use of artificial intelligence. (Makridakis, 2017).The published scientific literature broadly suggests that AI technology possesses the potential to serve as a significant asset in education, occupying various roles that enrich both learning and pedagogical experiences. Authors have suggested that AI technology is an instrumental tool in essay grading (Badreldin et., 2023). Research has demonstrated that AI technology serves as a crucial tool in the education sector, playing numerous roles, contributing towards providing enriching pedagogical and learning experiences (Babitha & Sushman, 2023). It also serves as a tool for grading systems by differentiating both strengths and weaknesses within a provided task in an automatic process of grading for demonstrating both the strengths and weaknesses of students in an extensive spectrum of assignments,including academic essays, research articles and other written coursework (Kasneci et al., 2023). In modern education, ChatGPT has played a transformative role in education, particularly in personalized learning by producing individualized learning experiences by producing personalized materials and providing instantaneous, individualized support to learners. For instance, this AI-model can generate singular practice questions and educational materials customized to the learner's specific pursuits and learning objectives. If educators ensure that ChatGPT is utilized conveniently, it can benefit learners (Grassini, 2023).The use of ChatGPT not only serves as a positive aspect for personalized learning, but it also supports the development of more insightful content and the enhancement of educational management in the aspects of effectiveness and efficiency (Montenegro-Rueda et al., 2019).

Impact on Student Engagement and Outcomes

Research exhibits that personalized learning enhances student motivation, enhances knowledge presentation, and assists in tackling learning gaps. Digital collaborative resources and interactive online content nurture a more intriguing educational environment (Montenegro-Rueda et al., 2023). Blended learning models merge traditional educational methods with technological tools to provide a more personalized learning experience. Evidence-based instruction enables educators to utilize analytics and student performance data to adapt lesson plans adaptively (Grant & Basye, 2014). Kalantzis and Cope (2020) analyzes the function of virtual environments that assist personalized learning by providing multiple tools and resources through multiple features such as interactive activities and assessments that can be used for assessing learners with varying educational needs. By gathering and examining data on student performance and engagements, educators can obtain information on learner's outcomes and behaviors facilitating enlightened decision-making and prompt interventions in the lesson planning (Santos, 2020). Using digital resources in a classroom allows educators

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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to evolve away from traditional pedagogies, making lessons more engaging. Research demonstrates that if students remain active in a classroom, it increases their engagement, learning outcomes, and minimizes disruptive behaviour. Digital applications such as classroom response systems ("clickers") and learner's individual devices, merged with appropriate software, allow for instantaneous, personalized feedback and information compilation (Twyman, 2018).

Data Analysis and Findings in Schools and Other Academic Institutions

A survey was conducted of 308 student-centered schools that fulfilled at least three of the five criteria regarding personalized learning: project-based learning, personalized learning plans, criterion-referenced assessment, competency-based student progress, and multi-year mentoring. This survey compiled the interview of 245 educators across 42 institutions. The survey revealed that only 12% of educators reported possessing a digital system that incorporated all four primacy aspects (planning, training, evaluation and record-keeping). On the other hand, 21% of educators stated they had no particular technological system in position. Technology was more broadly utilized for instruction and planning, while its implementation in record-keeping and evaluation was less common. This research further emphasized the significance of technological devices in personalized learning, which included: planning and design, instructional delivery, technology-based assessment, and maintaining digital records (Reigeluth & Karnopp, 2013). The integration of adaptive learning technologies is reforming academic policies, highlighting data-driven decision-making methods. Students experience personalized lessons simplified through technology, and progressive academic systems are modifying traditional pedagogies, fostering personalized teaching to fulfill individual student needs (Japiassu, 2024).Educators may need to adjust to new roles as moderators of digitally-enhanced education, demanding continuing professional development to efficiently incorporate these frameworks into their pedagogies (Roberts – Mahoney et al., 2016).

Different Perspectives on Personalized Learning

Personalized learning has been used for many decades and in the past, it was used during one-on-one tutoring sessions, before the technological advancements. Personalized learning application is influenced through pedagogical, institutional, and cultural interpretations. Some personalized learning resources focus on student independence, while others highlight evidence-based adjustable systems. The absence of a proper framework directs towards irregularities in utilizing personalized education strategies aseducators and policymakers face challenges to adjust personalized learning goals with functional applications (Ambele et al., 2022).Personalized learning frameworks are constructed to position academic content with personalized student needs and interests, significantly amplifying student participation and streamlining a thorough elaboration of the subject. Research shows that personalized learning can result in improvement of students' academic achievements, as lessons are created according to each students' strengths and weaknesses which helps them hone their problem-solving abilities, and independent learning skills, preparing them for life after school (Shemshak & Spector, 2020).

Use of Facebook in Personalized Learning

Social media can also be used in an innovative way to personalize learning experiences for students to strengthen learning experience. Some educators have established Facebook applications to develop more compelling and personalized educational experiencesfor learners.

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ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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Educators have reported using Facebook to share comments, post learning resources, and streamline academic discussions, developing an engaging and a vibrant educational space that stretches past a conventional classroom setting. Through Facebook, educators develop a sense of community among students, empowering partnership and collaborative learning, while allowing an instantaneous mode of communication amongst educators and students.

Learner Model: Cognitive and Non-Cognitive Characteristics

A learner model is a digital portrayal of a learner's skills, knowledge, behaviors, and preferences utilized in an adjustable educational system to provide personalized teaching and assistance to students accordingly. It constantly updates guided by learner communication, allowing the system to accommodate educational pathways adaptively (Vagale et el., 2020).

Learner modeling is a foundation of adaptive instructional environments, providing to personalize academic experiences by justifying personal learner characteristics: cognitive and non-cognitive characteristics. Cognitive characteristics include learning styles and knowledge levels and non-cognitive factors include emotional states and motivation level. Incorporating both cognitive and non-cognitive skills into learner models assures a comprehensive, student focused framework towards education. This structure allows adaptive systems to offer targeted teaching, emotional support, and individualized complications that enhance student success (Beck & Mostow, 2008).By acknowledging the connection between intellectual skills and interpersonal skills, teachers and AI-enhanced frameworks can transform personal learning insights, promoting academic achievement, motivation and continuous cognitive abilities (Spector, 2013). In short, the learner model is crucial for developing responsive learning domains that embrace the developing needs of each learner, thereby enhancing efficient and individualized educational experiences.

Meta-Analysis-the Efficiency and Digitally-Enhanced Personalized Learning Experience

Research by Zheng et al. (2022) evaluates the influence of personalized learning supported by digital tools on students' educational performance and their perspective of learning. This research demonstrated that digitally-enabled individualized educationalexperiences have a moderate impact on a student's learning experience, revealing an important advancement compared to conventional learning methods. The framework had a small effect size on students' perceptions of their educational experiences, proposinga humble positive impact. (Zheng et al., 2022). The researchers examined ten moderator variables to comprehend their impact on the efficiency of personalized learning (sample levels, sample sizes, learning domains, research design, research settings, intervention duration, learning methods, personalized learning software, hardware support, user-oriented personalized parameters. (Zheng et al., 2022)Amongst the analyzed moderators, the most influential moderators are: learning methods and personalized learning software. These conclusions emphasize the possibility of digitally-assisted individualized learning to enhance learning outcomes, particularly when relevant educational strategies and software are implemented. (Zheng et al., 2022).

History of Personalized Learning: Technologically-equipped TESOL classrooms

Personalized learning is not a recent concept as its origins can be discovered back to the beginning of the 20th-century digital education tools. Despite assertions of advancement, many personalized learning digital tools still operate within a structured framework as the evidence-based approach in TESOL often reflects traditional assessment models rather than cultivating

ISSN E: 2709-8273
ISSN P:2709-8265
JOURNAL OF APPLIED LINGUISTICS AND TESOL
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accurate learner self-sufficiency. For instance, AI-enhanced, language learning applications may individualize content, but they still depend on predefined sequencesand standardized tests (Majeed et al,. 2025). The transition towards commercialization in education has led to tech companies, not educators, sculpting educational resources as they prioritize data and profit collection over pedagogy. While digital tools optimize personalization in linguistic acquisition, TESOL educations must incorporate technology with learner-centered pedagogies (Zhang et al., 2020).

The Role of AI in Curriculum Development -Personalized Learning

As it was aforementioned, AI plays a crucial role in curriculum development, making it more effective and adaptable in developing personalized learning materials for students of varying learning needs. Collaboration is crucial amongst policymakers, technologists, and educators to organize ethical guidelines and guarantee equal access to artificially-enhanced learning tools (Ayeni et al., 2024).

Challenges Associated with Integration of Technology in TESOL

Personalization and Student Outcomes As aforementioned points demonstrate, personalized learning with the integration of technology has become an essential aspect of TESOL classrooms. While the aforementioned technological sources strengthen student experience by tailoring lesson plans according to individual student needs, their execution presents several obstacles. Many TESOL trainers encounter difficulties related to inadequate digital frameworks and materials, which can obstruct the efficient incorporation of personal learning tools. Furthermore, teachers need proper training and guidance on how they can successfully incorporate AI and other technology devices in TESOL classrooms to avoid potential misapplication or inefficiency (Shemshack et al., 2021). Shemshack and Spector (2020) studied that the personalized learning area is distinguished by numerous terms such as individualized instruction, adaptive learning and tailored learning -which can lead to uncertainty and fluctuations in execution methods. This linguistic inclusiveness demonstrates a challenge for educators in TESOL environments to produce an integrated framework towards personalized learning (Shemshack & Spector, 2020). Additionally, some parents, educators and administrators may not be familiar with the advancement of technology and its integration into the education system, which can hinder the adoption of digitally-enhanced personalized learning strategies (Udeh, 2025). Students need to have access to essential technological sources and stable internet connections if they want to attain full benefits of personalized learning in TESOL classrooms (Zheng et al., 2022).

Gaps in the Literature

Integration of Technology in TESOL -Personalization and Student Outcomes Despite influential developments in technology-enhanced TESOL education, there remains significant gaps in the literature regarding how personalized learning via technological resources impact student outcomes. Existing research has examined either technology integration in language learning or personalized learning strategies, but there is a lack of studies investigating their integrated impact on the academic success, engagement, and motivation of TESOL students (Al-Zeebaree & Ameen, 2024; Bui & Cong-Lem,2023).This study aims to resolve these gaps by supplying observational evidence on how digitally-driven personalization strengthens English language learning in multifaceted TESOL contexts. 2. 24. 1. Inadequate Research on the Merged Influence of Technology and Personalized Learning in TESOL Studies have distinctively explored the function of technology in English language learning (Ortikov,

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2024) and the efficiency of personalized learning methods (Ratih & Fauziati, 2024). However, insufficient examinations evaluate how the incorporation of these two dimensions -adaptive learning technology and student-centered approaches -impacts TESOL learners' performance (Alshuraiaan & Almefleh, 2023).While technological platforms and artificial-intelligence powered devices are reforming language education, the domain falls short of a thorough comprehension of how personalized digital strategies impact language advancement, fluency maintenance and engagement levels (Chen et al., 2023). This study connects this gap by examining which personalization techniques within digital TESOL environments improve learning efficiency.

Lack of Extended Research on Digital Personalization in TESOL

Existing research on technology-enhanced learning in TESOL concentrates primarily towards short-term outcomes, such as foundational engagement and classroom cooperation (Alshahrani, 2024). However, the prolonged impact of digitally-enhanced personalizationon English language learning and fluency advancement remain predominantly unexamined. (Wu, 2023).

Confined Emphasis on Educator Readiness for Incorporating Technology Personalization

While the function of technology in TESOL classrooms has been extensively documented (Udeh, 2025), there is minimal research on how well teachers are prepared to incorporate personal learning through technology platforms (Nurhidayat, Mujiyanto, & Yuliasri,2023). Many TESOL educators do not have sufficient training in flexible educational tools, directing towards irregular incorporation of digitally refined personalized instruction (Yang & Walker, 2015). Personalized learning depends significantly on educator streamlining, yet research on how teachers incorporate digital personalization into their lesson plans is restricted (Putri & SS, 2024).

Disregarded Technological Access and Fairness Challenges in TESOL Personalization

Most studies presume identical access to technological resources among TESOL learners, but socioeconomic differences in technology access remain a prominent barrier (Solikhah, 2023). This literature overlooks how learners from lower-socioeconomic backgrounds or districts with restricted digital-infrastructures interact with personalized technological educational resources (Celik, 2024). Without acknowledging digital inclusion concerns, it is unfeasible to evaluate whether digitally-augmented personalizationcompensates how digitally-enhanced personalization is advantageous for all learners at an equal extent. This research tackles this disproportionate gap by examining how various student demographics experience and communicate with personalized TESOL technology.

Limited Research on AI-Enabled Personalization in TESOL

Although AI-enhanced education tools are becoming more common, their precise influence on personalized TESOL learning is still insufficiently analyzed (Lee, Kuo, Xu, & Hu, 2022). Recent developments in chatbots, machine learning, and AI-powered feedback systems have demonstrated potential in personalizing language education, but few studies analyze their efficiency within TESOL contexts (Bang, 2024). The application of dynamic AI in TESOL could transform personalized learning, yet research has not entirely examined the impact of these tools on TESOL student motivation, long-term retention and performance (Wang et al., 2024). This study occupies this digital gap by evaluating the function of AI-enhanced personalization in TESOL and its impact on student results. Chapter 3: Research Methodology (Secondary Research Approach)This chapter explores the research framework,

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data analysis approach, data collection methods, potential limitations and ethical considerations. This study evaluates the incorporation of technology in TESOL classrooms, with a significance on personalization and student outcomes. Given the essence of this research, a secondary research framework has been acquired to examine and synthesize existing studies, data resources and literature.

3. Research Methodology

Research Design

This paper is based on secondary research, depending on formerly published academic reports, statistical data, and studies to evaluate the effect of technology on personalized learning and student engagement in TESOL classrooms. Instead of compiling primary information through surveys and interviews, this research methodically examines existing literature and experiential studies to select relevant data and findings. An approach of qualitative content analysis is acquired by this research, reviewing challenges, trends, and educational outcomes of digitally-enhanced learning in TESOL.

Data Sources

This research emphasizes the analyzation of secondary data sources, including:

- Peer-reviewed journal articles on technology use in TESOL
- Published reports and policy documents from academic institutions and government entities
- Experiential research and case studieson technological personalization in language learning
- Statistical surveys and dataimplemented in previous studies connected to student engagement and digitally-enhanced educational outcomes. These sources guarantee a sturdy and varied data pool, minimizing the threat of bias associated with the responses of individual participants.

Data Analysis and Findings

Presentation of Findings

Experiences with Technologically-Enhanced Personalized Learning

> Noel Russell, a specialist in AI-powered chatbots, language models, and generative AI, imparts her experiences equalizing work and personal life as a mother of six while trailblazing AI-enhanced education (Russell, 2023).According to Russell (2023), AI models assist parents to create an effective Individualized Education Plan (IEP), ensuring smoother pedagogies for children with special needs. She states, "The first pillar of learning is how my son, my firstborn son Max -he was born with Down Syndrome -put me on this path of using assistive technology to aid in learning. I realized that it was crucial for him, but it also developed an opportunity for my other children who were typically developing to strengthen their ability to learn." (Russell, 2023, 2:15).
>
> Russell further stated, "Imagine if we could take those papers and in the world of GPT-4.0 or an Azure OpenAI service, we could build a model that allows us to pass in all of those forms that we got our kids to fill out as teachers. Wouldn't that be amazing? And then just tell me the mode based on every individual student, first, create a database to

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hold all of my students. Second, create an individualized learning path based on the common core curriculum for third grade.and poof—it will do it." (Russell,2023, 4:30).

AI-Enhanced Personalized Learning:

Sal Khan's Vision for the Future of EducationKhan Academy is a non-profit digital education platform that presents well-crafted courses for free to students globally. It was founded by Sal Khan in 2008 who first created this platform to offer tutoring sessions to his cousins. Since its inception, theKhan Academy has widened to provide a personalized, proficiency-based learning experience for learners of all ages. It is known as the personalized learning resource for students of all age groups (Khan Academy, n.d.). Sal Khan believes that traditional classrooms make learners feel bored or lost and technologically-enhanced learning provides students with a chance to learn at their own speed rather than being limited by a preset curriculum. He states, "I've always been fascinated by this personalization in education. I thought that there was a lot of opportunity for getting more people to get much further if they were allowed to learn at their own pace, to fill in their gaps. With software, you can start to do some personalization, you can start to do someanalytics and it could scale." (Khan, 2023, 3:45)

The Rise of Technology for Personalized Learning -Individualized Learning in K-12 Education and Beyond

Keven Bushweller, the Assistant Managing Editor at Education Week, emphasizes the significance of technology and how it provides teaching methods impactful real-time data tracking and adoption by developing adaptive curricula based on student performance, ensuring they attain proficiency in concepts before advancing. Additionally collaborative tools and social media strengthens student engagement by promoting engaging and collaborative learning. He states, "More than 90% of schools now report using digital tools to personalize learning in some way. The era of personalized learning in K-12 has clearly arrived." (Bushweller, 2023, 00:10)

Balancing Ethics and Innovation: Dr. Nelly Deutch on Artificial Intelligence in Personalized Learning

Dr. Nelly Deustch, an experienced EFL (English as a Foreign Language) educator has incorporated technology into teaching since 1992 and is currently teaching immersive technologies in an online Master's program at a university in Greece (Deutsch, 2023).

Regarding the limitations of AI for personalized education, he stated, "If we don't have knowledge to distinguish what is right and what is wrong, then we are doomed." (Pat, 2023, 02:45) -emphasizing the need to train the teachers to effectively utilize technological devices in classrooms. He further added, "AI is only as good as what we put into it. If we stop producing new knowledge, our AI will only be as good as the past, and we won't have a future" (Pat, 2023, 03:10). Pat's research suggests that AI tutors

ISSN E: 2709-8273
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were created according to admirable figures (e.g. favorite authors, historical figures) can improve student engagement.

Personalized Learning with AI Helper

AI Learning Helper, a resource created to help children in attaining the basic knowledge on how to read through an engaging and collaborative learning experience (AI Learning Helper, 2023). The AI system serves as a personalized learning companion, offering realistic feedback and guidance to assist children in developing their literary skills by providing explanations and definitions when children connect with new words, making learning more interactive and engaging (AI Learning Helper, 2023).

Further Insights into Digital Technology and TESOL

Advancing Research and Critical Findings According to research by Omar Jian (2023), AI systems can process extensive datasets to recognize individual learning structures, providing the personalization of academic material to meet the specific learner needs. The research further revealed that AI-enhanced virtual assistants play the role of personal tutors, providing immediate feedback, responding to questions, and endorsing resources based on the student's educational trajectory. The study "The Role of Technology in Facilitating EFL Learning: A Case Study Approach" by Smith and Lee (2024), examines the incorporation of digital tools in English as a Foreign Language (EFL) education. The study conducted at Universitas Pahlawan Tuanku Tambusai evaluates how technology strengthens educational experiences, engagement, and efficiency while also determining crucial obstacles.

The case study coordinates with prior research revealing that technology improves second-language acquisition (Smith, 2017). However, it also elevates difficulties about digital equity, as irregular resource access can develop inequalities in educational opportunities (Jones & Lee, 2023). To discuss these obstacles, institutions must incorporate teacher training programs and contribute towards sufficient infrastructure assistance (Brown, 2022). Overall, the case study emphasizes the revolutionary prospects of technology in EFL learning but emphasizes the need for critical incorporation to resolve challenges. Future research should examine longitudinal studies to evaluate the long-term influence of technology on language learning and examine innovative solutions, such as AI-enhanced learning assistants (Chen, 2024). A study published in the BMC Psychology revealed the role of TESOL and digital technology in attitudinal change and sustainable learning for students of higher education (Chen et al., 2023). Chen et al., (2023) emphasize that TESOL combined with digital systems strengthens behavioral change, making learners more comfortable with multicultural communication and prolonged language learning, and by incorporating technical resources in TESOL classrooms, language acquisition can be enhanced, fostering multicultural comprehension. This research finding aligns with the paper's focus on sustainable learning, as behaviours towards language learning strongly impacts long-term commitment and motivation (Dörnyei, 2005).

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among Iranian English Language Teaching Teachers -an In-Depth Case StudyResearch by Sadeghi and Azadibougar (2023) examines how demographic elements such as gender, age, and experience impact teachers' perspective of virtual education in TESOL. These outcomes are applicable to the paper's focus on digital technology, TESOL, self-efficacy, and student learning outcomes, as they emphasize possible obstacles to technology incorporation in language education. Sadeghi and Azadibougar (2023) discovered that male educators had a more positive perspective towards digital learning than female educators. Thai observations align with the research recommending that technology incorporation in education is often impacted by gender perceptions (Zhou & Xu, 2007).

From a TESOL outlook, this gender disparity could influence how digital resources are integrated into language teaching. If female educators are resistant towards digital education, learners under their instruction may have less opportunities for self-regulated learning (SRL) through online platforms (Zimmerman, 2002). Since SRL is a significant predictor of academic accomplishment in TESOL (Chen et al., 2023), it is crucial for academic institutions to tackle gender inequalities through professional advancement initiatives (Mishra & Koehler, 2006). Furthermore, socio-cultural learning theory (Vygotsky. 1978) highlights the function of educators in forming students' educational experiences. If gender inequalities in technology incorporation impact TESOL instruction, it may restrict learners' long-term engagement with online educational environments. The study by Sadeghi and Azadibougar (2023) also revealed that TESOL educators who are older and more experienced were less motivated to incorporate digital learning than young educators. This finding is coherent with research on technological resistance among experienced educators, where traditional pedagogies may not readily adapt technology incorporation (Selwyn, 2011). The resistance has notable outcomes for TESOL. If older and more experienced instructors keep away from digital resources, they may be less efficient amongst learners (Bandura, 1997).

This study conducted in Malaysia revealed that preserving student participation and motivation in an online learning environment proved to be demanding. Lukas and Yunus (2021) observed that ESL tutors faced difficulties in classroom management, lack of face-to-face interactions, constrained availability to crucial resources contributed to diminished engagement between students (Lukas & Yunus, 2021). This takes us back to our previously stated observations, that student participation is known to increase with gamification, and the incorporation of other tools such as videography, etc.

Motivation and Autonomous Learning

A study conducted by Sarah Houssami and Driss Benattabou (2024), from the Department of English Studies, School of Arts and Humanities at Moulay Ismail University, Meknes, Morocco examined the relationship between the kinds of motivation

-intrinsic, extrinsic, and amotivation -and participation in independent educational activities among Moroccan EFL university students. The research demonstrated a substantial positive relationship between intrinsic motivation and participation in autonomous educational activities, implying that essentially motivated learners have a stronger possibility of pursuing activities that assist language learning and independence. In contrast, extrinsic motivation demonstrated a frail correlation with autonomous learning, demonstrating its restricted role in developing student autonomy (Kormos & Csizér, 2014).

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