Reconceptualising Technology Acceptance Among Elementary ESL Teachers in Malaysian Public Schools: Extending the UTAUT Perspective

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Abstract*—Technology integration has become an important component of contemporary English as a Second Language (ESL) instruction, particularly as education systems increasingly promote digital learning and technology-supported pedagogy. However, teachers' acceptance of technology remains shaped by more than the availability of digital tools or policy expectations. This conceptual paper examines technology acceptance among elementary ESL teachers in Malaysian public primary schools through the lens of the Unified Theory of Acceptance and Use of Technology (UTAUT). Specifically, it discusses how performance expectancy, effort expectancy, social influence, and facilitating conditions may be interpreted within the pedagogical, institutional, and contextual realities of elementary ESL education. The paper argues that existing applications of UTAUT in educational technology research often emphasise predictive relationships while providing limited attention to classroom-level instructional demands, school culture, professional support, and policy-practice gaps. By extending the UTAUT perspective, this paper proposes a more contextualised understanding of technology acceptance that incorporates pedagogical readiness, institutional support, learner needs, and digital education policy implementation. The discussion contributes to educational technology literature by highlighting the need for context-sensitive interpretations of technology acceptance frameworks. It also offers implications for teacher professional development, school leadership, and policy implementation aimed at strengthening meaningful and sustainable technology integration in Malaysian elementary ESL classrooms.

***Keywords*—UTAUT, technology acceptance, ESL teachers, behavioural intention, technology integration, Malaysian public schools**

I. INTRODUCTION

The integration of technology into educational practices has become a central focus of contemporary education systems worldwide. Rapid technological advancement and increasing digitalisation have transformed teaching and learning environments, encouraging schools to adopt technology-enhanced instructional approaches that support collaboration, interaction, flexibility, and access to diverse educational resources [1], [2]. As digital technologies continue to reshape educational landscapes, the role of teachers in facilitating technology-supported learning has become increasingly important. Educational institutions are therefore expected not only to provide technological infrastructure, but also to ensure that teachers are prepared and willing to integrate digital tools effectively into classroom instruction.

In recent years, the shift from traditional teacher-centred instruction towards more learner-centred pedagogical approaches has accelerated the adoption of educational technologies across different educational contexts [3], [4]. Technology integration is increasingly associated with the promotion of active learning, critical thinking, collaborative engagement, and personalised instructional practices [5], [6]. Within language education, digital technologies provide opportunities for learners to engage with authentic materials, interactive communication platforms, and multimodal learning environments that support language development beyond conventional classroom practices [7], [8]. The growing prominence of Computer-Assisted Language Learning (CALL), Mobile-Assisted Language Learning (MALL), and Technology-Enhanced Language Learning (TELL) further reflects the expanding role of technology in supporting English language teaching and learning [9], [10].

The integration of technology in English as a Second Language (ESL) instruction has received increasing scholarly attention due to its potential to support communicative competence, learner engagement, and meaningful language interaction. Recent studies have suggested that technology-enhanced instructional approaches may facilitate collaborative learning, immediate feedback, authentic

communication, and access to real-world language resources [11], [12]. Meta-analytic and systematic review evidence also indicates that digital learning approaches, including blended learning and flipped classroom models, are positively associated with language learning outcomes when integrated purposefully into instructional practices [8], [13]. These developments highlight the growing significance of technology integration within contemporary ESL education.

In Malaysia, technology integration has become a major component of educational transformation initiatives. National policies such as the Malaysia Education Blueprint 2013–2025 and the Digital Education Policy introduced by the Ministry of Education Malaysia emphasise the importance of integrating digital technologies into teaching and learning processes to strengthen educational quality and digital readiness among students and teachers [14], [15]. The Ministry of Education has invested substantially in digital infrastructure, internet accessibility, and educational technology initiatives to encourage technology integration across Malaysian schools. These initiatives reflect broader governmental efforts to support digital transformation within the national education system.

Despite continuous policy emphasis and technological investment, the implementation of technology integration in schools remains uneven. Existing literature continues to report variations in teachers' use of technology across educational settings, with many teachers encountering challenges related to digital competence, professional readiness, institutional support, workload, and infrastructure limitations [16], [17], [18]. UNESCO [2] similarly highlighted that the availability of technological resources alone does not necessarily lead to meaningful classroom integration without adequate teacher preparedness and support systems. Within the Malaysian context, previous studies have also reported inconsistencies in technology adoption among teachers despite increasing policy-driven expectations for digital integration in schools [19], [20].

These challenges are particularly relevant within elementary ESL classrooms, where instructional demands differ considerably from those in secondary or tertiary educational contexts. Elementary ESL teachers are required to balance language acquisition, classroom interaction, learner engagement, and pedagogical adaptation simultaneously while integrating digital tools into instruction. Younger learners may also require more guided interaction, multimodal learning support, and scaffolded digital engagement, thereby increasing the complexity of technology integration within primary-level ESL classrooms. Consequently, understanding technology acceptance among elementary ESL teachers requires consideration not only of technological factors, but also of contextual pedagogical and institutional realities.

One of the most widely applied frameworks for examining technology acceptance is the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. [21]. The UTAUT framework proposes that individuals' behavioural intention to use technology is associated with four principal constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. The framework has been widely utilised across educational technology research to examine teachers' acceptance and use of digital technologies in instructional settings [22], [23]. Existing studies consistently support the relevance of UTAUT in explaining behavioural intention towards technology adoption among educators.

However, despite the extensive application of UTAUT in educational technology research, existing studies have predominantly focused on higher education, secondary education, or general teaching populations, with comparatively limited emphasis on elementary ESL teachers within Malaysian public primary school contexts [24], [25]. Furthermore, many existing applications of UTAUT primarily emphasise technological and psychological dimensions of technology acceptance while providing comparatively less attention to contextual educational realities that may shape technology integration practices among elementary ESL teachers. Factors such as institutional expectations, pedagogical demands, professional support, and classroom-level instructional realities may influence how teachers perceive and adopt educational technologies within primary ESL environments.

Accordingly, there is a need to reconceptualise the application of technology acceptance frameworks within elementary ESL educational settings by considering the broader contextual dimensions associated with technology integration in Malaysian public primary schools. Extending the UTAUT perspective within this context may contribute towards a more nuanced understanding of teachers' behavioural intention to integrate technology in ESL instruction while also supporting more contextually responsive educational policies and professional development initiatives.

Therefore, this conceptual paper examines technology acceptance among elementary ESL teachers in Malaysian public primary schools through the lens of the Unified Theory of Acceptance and Use of Technology (UTAUT). Specifically, the paper discusses the contextual, pedagogical, and institutional dimensions associated with technology integration and proposes the need for a more contextualised interpretation of UTAUT within elementary ESL educational settings.

II. UTAUT and Technology Acceptance in Educational Contexts

A. Technology Acceptance in Education

The increasing integration of digital technologies into educational environments has generated substantial scholarly interest in understanding the factors influencing teachers' acceptance and use of technology. Technology acceptance in education generally refers to individuals' willingness and intention to adopt technological tools for instructional purposes

[26]. As educational systems continue to promote digital transformation initiatives, understanding teachers' behavioural intention to use technology has become increasingly important because teachers play a central role in determining the effectiveness of technology integration within classrooms.

Existing research suggests that technology integration in education is not solely dependent on the availability of technological resources, but is also associated with teachers' perceptions, attitudes, readiness, and institutional environments [2], [16]. Teachers who perceive technology as beneficial, manageable, and supported within their professional environment are generally more likely to incorporate digital tools into instructional practices. Conversely, limited digital competence, insufficient training, lack of institutional support, and infrastructural constraints may negatively influence teachers' willingness to adopt educational technologies [17], [18].

Within language education, technology acceptance has become particularly significant due to the increasing use of digital learning platforms, multimedia resources, communication technologies, and online collaborative environments in English language teaching. Technology-enhanced language learning environments may support authentic communication, learner interaction, multimodal learning experiences, and access to diverse language resources [7], [10]. Nevertheless, the successful integration of technology in ESL instruction remains closely associated with teachers' readiness and behavioural intention to use digital technologies effectively within classroom practices.

As a result, numerous theoretical models have been developed to explain individuals' acceptance and adoption of technology. Earlier frameworks such as the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), and Diffusion of Innovation Theory (DOI) have contributed significantly to technology acceptance research [27], [28], [29]. However, the increasing complexity of technology adoption behaviours across organisational and educational contexts led to the development of more integrated theoretical approaches, including the Unified Theory of Acceptance and Use of Technology (UTAUT).

B. Overview of the Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh et al. [21] to provide a comprehensive framework for understanding individuals' behavioural intention and technology use behaviour. The model synthesised elements from eight prominent technology acceptance theories and proposed four principal determinants influencing behavioural intention and technology adoption, namely performance expectancy, effort expectancy, social influence, and facilitating conditions.

Performance expectancy refers to the extent to which individuals believe that using technology will help improve their job performance [21]. Within educational settings, teachers are more likely to integrate technology when they perceive that digital tools can enhance instructional effectiveness, classroom management, learner engagement, and educational outcomes. Previous studies consistently indicate that perceived usefulness and instructional value are strongly associated with teachers' behavioural intention to use technology in teaching and learning processes [20], [22].

Effort expectancy refers to the perceived ease associated with the use of technology. Technologies that are considered user-friendly, manageable, and accessible are generally associated with stronger behavioural intention among users [21]. In educational contexts, teachers who perceive technological tools as easy to learn and implement are more likely to adopt them in classroom instruction. Existing literature continues to identify effort expectancy as an important predictor of teachers' technology acceptance across various educational settings [23], [30].

Social influence refers to the degree to which individuals perceive that important others believe they should use a particular technology. In school environments, social influence may originate from school leadership, colleagues, policymakers, students, or broader institutional expectations. Positive professional cultures and supportive educational communities may therefore strengthen teachers' motivation and intention to integrate technology into classroom practices [21], [31].

Facilitating conditions describe the extent to which individuals believe that organisational and technical infrastructures exist to support technology use. In educational settings, facilitating conditions include access to technological resources, internet connectivity, technical assistance, institutional support, and professional development opportunities. Adequate facilitating conditions may increase teachers' readiness and confidence in using technology for instructional purposes [2], [32].

The UTAUT framework further proposes that these constructs collectively influence behavioural intention, which subsequently affects actual technology use behaviour. Due to its comprehensive explanatory capacity, UTAUT has become one of the most widely applied frameworks in educational technology research.

C. UTAUT in Educational Technology Research

The application of UTAUT in educational contexts has expanded considerably over the past decade. Numerous studies have utilised the framework to examine teachers' acceptance of educational technologies across different educational levels, subject areas, and geographical contexts. Existing literature generally supports the relevance of UTAUT constructs in explaining teachers' behavioural intention to use digital technologies in instructional settings [22], [23], [31].

Recent studies indicate that performance expectancy frequently emerges as a strong predictor of technology acceptance among educators. Teachers are generally more willing to integrate technology

when they perceive that technological tools contribute positively to instructional quality, learner participation, and professional effectiveness [30], [31]. Similarly, effort expectancy continues to demonstrate significant influence on teachers' technology adoption, particularly when technologies are perceived as accessible and manageable within existing classroom practices [22].

Social influence has also been identified as an important factor affecting technology acceptance within educational environments. Supportive institutional cultures, administrative encouragement, and collaborative professional communities may positively shape teachers' behavioural intention towards technology use [33]. In addition, facilitating conditions remain essential in supporting sustainable technology integration, particularly in contexts where technological infrastructure and institutional support systems vary significantly [32].

Within language education, UTAUT has increasingly been applied to examine technology integration among ESL and EFL educators. Existing studies suggest that language teachers' technology acceptance is influenced by pedagogical expectations, digital literacy, technological accessibility, and instructional demands associated with language learning environments [34]. Nevertheless, the majority of these studies have concentrated on higher education or secondary school contexts, with comparatively limited attention given to elementary-level ESL teachers.

D. Limitations of Existing UTAUT Applications in Educational Contexts

Despite the widespread application of UTAUT in educational technology research, several limitations remain evident within existing literature. One notable limitation is the tendency to apply UTAUT primarily as a predictive statistical framework without sufficiently contextualising the educational environments within which technology integration occurs. Many studies emphasise the measurement of relationships between constructs while providing comparatively limited discussion regarding the pedagogical, institutional, and contextual realities influencing teachers' technology acceptance behaviours.

In addition, existing UTAUT research within education has predominantly focused on higher education institutions, pre-service teachers, or general teaching populations [24], [25]. Comparatively fewer studies have examined elementary ESL teachers specifically, despite the distinct pedagogical and instructional demands associated with primary-level language education. Technology integration within elementary ESL classrooms involves unique considerations related to learner age, classroom interaction, scaffolding, multimodal instruction, and communicative language development that may not be fully captured through generic applications of technology acceptance frameworks.

Furthermore, contextual factors associated with educational systems may also shape teachers' behavioural intention in ways that extend beyond technological perceptions alone. Institutional culture, workload expectations, professional development opportunities, policy implementation practices, infrastructure disparities, and school-level support systems may significantly influence teachers' experiences with technology integration. However, these contextual dimensions are often underemphasised within existing UTAUT applications.

Within the Malaysian context, although technology integration has been strongly promoted through national educational policies, classroom implementation continues to vary considerably across schools and educational settings [15], [19]. Existing studies suggest that differences in technological access, institutional support, and teachers' professional readiness may affect the effectiveness of digital integration initiatives. Consequently, there is a need to extend and contextualise the application of UTAUT within Malaysian elementary ESL educational environments to better reflect the realities associated with technology integration in public primary schools.

III. Technology Integration in Elementary ESL Education

A. Technology and Language Learning

The integration of technology into language education has transformed the ways in which English is taught and learned across different educational contexts. The increasing availability of digital platforms, multimedia resources, online communication tools, and interactive learning applications has expanded opportunities for language learners to engage with authentic linguistic input and meaningful communicative activities [7], [35]. Technology-enhanced learning environments may support flexibility, learner autonomy, collaboration, and immediate feedback, which are considered important elements in contemporary language instruction.

Over the past two decades, the development of approaches such as Computer-Assisted Language Learning (CALL), Mobile-Assisted Language Learning (MALL), and Technology-Enhanced Language Learning (TELL) has significantly influenced instructional practices within ESL and EFL classrooms [9], [10]. These approaches encourage the integration of digital technologies to facilitate language acquisition through interactive and learner-centred activities. Digital tools such as language learning applications, educational videos, online discussion platforms, collaborative writing tools, and gamified learning environments have become increasingly prominent within English language instruction.

Recent research indicates that technology integration may positively support language learning outcomes when digital tools are aligned meaningfully with instructional objectives and pedagogical practices [8], [13]. Meta-analytic evidence suggests that technology-enhanced instructional approaches contribute positively to learner engagement, communicative competence, motivation, and academic

achievement within language learning environments [13]. Similarly, systematic reviews have highlighted that digital learning environments may facilitate authentic communication, collaborative learning, and contextualised language practice that extend beyond conventional classroom limitations [12].

In addition, technology provides access to authentic language materials and global communication opportunities that support real-world language exposure. Learners may engage with multimedia content, online interactions, digital storytelling, and virtual communication platforms that expose them to diverse language contexts and communicative experiences [11]. Such opportunities are particularly relevant in ESL settings, where exposure to authentic English communication outside the classroom may be comparatively limited.

Nevertheless, the effectiveness of technology integration within language education remains dependent on how technologies are implemented pedagogically. Existing literature suggests that technology alone does not automatically improve language learning outcomes without appropriate instructional planning, teacher facilitation, and learner support [2]. Consequently, teachers continue to play a central role in determining how digital technologies are utilised to support meaningful language learning experiences.

B. ESL Pedagogical Demands in Elementary Classrooms

Technology integration within elementary ESL classrooms involves distinct pedagogical considerations that differ from those associated with secondary or tertiary educational contexts. Elementary learners are generally at earlier stages of language acquisition and cognitive development, requiring instructional approaches that emphasise scaffolding, interaction, multimodal engagement, and guided learning experiences. As a result, elementary ESL teachers are often required to balance language instruction, classroom management, learner motivation, and developmental support simultaneously.

Communicative Language Teaching (CLT), Task-Based Learning (TBL), and learner-centred instructional approaches have increasingly shaped contemporary ESL pedagogy [36]. These approaches encourage active learner participation, meaningful communication, collaborative engagement, and authentic language use. Technology integration within elementary ESL instruction may therefore support these pedagogical goals by providing interactive and multimodal learning environments that encourage participation and communication.

Digital technologies may assist elementary ESL teachers in creating engaging instructional experiences through visual supports, audio resources, interactive games, animation, collaborative tasks, and multimedia storytelling activities. Younger learners often respond positively to multimodal learning environments that combine visual, auditory, and interactive elements to support language comprehension and retention. Educational technologies may therefore enhance learner engagement and reduce anxiety associated with second language learning when implemented appropriately.

However, elementary ESL classrooms also present unique instructional challenges that may complicate technology integration. Younger learners frequently require closer teacher guidance, structured learning activities, and continuous classroom management support during technology use. Teachers may therefore encounter additional pedagogical responsibilities when integrating digital technologies into language instruction. In some cases, technological activities may increase classroom complexity rather than reduce instructional demands, particularly when learners possess varying levels of digital literacy or language proficiency.

Furthermore, elementary ESL teachers are often expected to integrate technology while simultaneously meeting curriculum requirements, language proficiency targets, assessment expectations, and classroom management responsibilities. These combined demands may influence teachers' perceptions regarding the practicality and usefulness of technology integration within everyday instructional practices.

C. Digital Technologies in Elementary ESL Classrooms

The increasing availability of educational technologies has expanded the range of digital tools used within elementary ESL classrooms. Teachers may utilise learning management systems, interactive presentation tools, educational applications, online videos, virtual learning platforms, collaborative digital environments, and gamified language-learning applications to support instruction. These technologies may facilitate learner interaction, differentiated instruction, and language practice within classroom environments.

Interactive technologies such as educational games and digital storytelling platforms are commonly associated with increased learner motivation and participation among younger language learners. Gamified learning environments may encourage active engagement and create enjoyable learning experiences that support vocabulary acquisition, pronunciation practice, listening comprehension, and communication skills. Similarly, multimedia resources may provide contextualised language exposure through images, sounds, videos, and animations that support learner understanding and retention.

Online collaborative tools may also encourage communication and interaction among learners through group activities, peer feedback, and shared learning tasks. Such technologies align with

communicative and learner-centred pedagogical approaches commonly associated with contemporary ESL instruction. In addition, digital technologies may support differentiated learning by allowing teachers to adapt instructional materials according to learners' varying proficiency levels and learning needs.

Despite these potential benefits, technology integration within elementary ESL classrooms remains uneven across educational contexts. Existing studies continue to report variations in teachers' technology usage practices due to differences in institutional support, technological infrastructure, professional development opportunities, and teacher confidence [2], [17]. Teachers may also experience difficulties in selecting appropriate technologies that align effectively with language learning objectives and classroom realities.

Moreover, the integration of digital technologies in elementary ESL classrooms requires teachers to possess not only technological knowledge, but also pedagogical understanding regarding how technology can support language acquisition processes. Consequently, technology integration within language education should be viewed as both a pedagogical and contextual process rather than merely a technical practice.

D. Teacher Readiness and Instructional Practice

Teacher readiness plays a critical role in shaping the effectiveness of technology integration within elementary ESL classrooms. Existing literature consistently indicates that teachers' perceptions, confidence, digital competence, and professional experiences influence their willingness and ability to incorporate technology into instructional practices [16], [34]. Teachers who perceive themselves as technologically competent and pedagogically prepared are generally more likely to engage in sustained technology integration.

Professional development opportunities are particularly important in supporting teachers' readiness to integrate technology effectively. Training programmes that focus on both technical skills and pedagogical application may strengthen teachers' confidence and facilitate more meaningful classroom implementation. However, previous studies suggest that many teachers continue to experience limited access to sustained professional support related to educational technology integration [17].

In addition, teachers' instructional practices are often influenced by institutional expectations, workload demands, infrastructure availability, and school-level support systems. Teachers may encounter challenges in balancing curriculum requirements, classroom management responsibilities, and technology integration simultaneously, particularly within primary educational environments. These contextual realities may shape teachers' perceptions regarding the practicality and sustainability of technology use in classroom instruction.

Within elementary ESL contexts specifically, teacher readiness extends beyond technological competence alone. Teachers are also required to consider learner developmental needs, language proficiency levels, classroom interaction patterns, and communicative learning objectives when integrating technology into instruction. Consequently, understanding technology acceptance among elementary ESL teachers requires consideration of the broader pedagogical and contextual dimensions associated with instructional practice.

The complexity of these instructional realities suggests that technology acceptance frameworks within educational research should not be interpreted solely through technological perspectives. Instead, technology integration among elementary ESL teachers should be understood within the broader context of pedagogical demands, institutional conditions, and classroom-level educational realities.

IV. Contextual Challenges in Malaysian Public Primary Schools

A. Malaysian Digital Education Policies and Technology Integration

Technology integration has become a major priority within the Malaysian education system as part of broader national efforts to strengthen digital transformation and educational quality. Over the past decade, the Ministry of Education Malaysia has introduced various policies and initiatives aimed at encouraging the incorporation of digital technologies into teaching and learning processes. Among the most significant initiatives are the Malaysia Education Blueprint 2013–2025 and the Digital Education Policy introduced in 2023, both of which emphasise the importance of digital learning environments and technology-supported instruction within Malaysian schools [14], [15].

The Malaysia Education Blueprint 2013–2025 specifically identified Information and Communication Technology (ICT) integration as a key educational transformation strategy under Shift 7, which focuses on leveraging ICT to improve learning quality across schools nationwide. Through this initiative, substantial investments have been allocated towards internet connectivity, digital infrastructure, technological resources, and teacher professional development programmes intended to strengthen digital learning implementation. The Digital Education Policy further reinforces these objectives by outlining strategies to enhance digital competence, strengthen technological infrastructure, and support the integration of digital technologies within classroom instruction [15].

These policy initiatives reflect Malaysia's broader commitment towards preparing students and educators for participation in increasingly digitalised educational and professional environments. Similar to global educational trends, Malaysian schools are expected to integrate technology into daily instructional practices to support interactive learning, collaborative

engagement, and learner-centred pedagogy [1], [2]. Consequently, teachers are increasingly expected to utilise digital technologies not only as supplementary tools, but also as integral components of instructional delivery and classroom engagement.

Nevertheless, despite extensive policy emphasis and governmental investment, the implementation of technology integration within Malaysian schools remains uneven. Existing studies continue to report variations in the extent to which digital technologies are utilised effectively within classroom practices [19], [20]. In many cases, technology integration remains influenced by contextual realities such as school infrastructure, institutional support, teacher readiness, and accessibility of technological resources.

Within primary school contexts specifically, the implementation of digital learning policies may present additional complexities due to differences in learner needs, classroom environments, and pedagogical demands. Elementary ESL teachers are often required to integrate digital technologies while simultaneously managing language acquisition, learner engagement, and curriculum delivery, thereby creating unique instructional challenges that may influence technology acceptance and integration practices.

B. Institutional and Infrastructure Constraints

One of the major challenges associated with technology integration within Malaysian public primary schools relates to institutional and infrastructural limitations. Although digital transformation initiatives have expanded access to technological resources across schools, disparities in infrastructure quality and technological accessibility continue to affect classroom implementation practices. Existing research consistently highlights that unequal access to internet connectivity, digital devices, and technical resources remains a significant barrier to effective technology integration, particularly in developing and geographically diverse educational contexts [2], [17].

Within Malaysian schools, variations in technological infrastructure may influence teachers' ability to integrate digital tools consistently into classroom instruction. Some schools possess relatively stable internet access, technological facilities, and institutional support systems, while others continue to encounter limitations related to bandwidth, device availability, maintenance support, and technological reliability. Such disparities may shape teachers' perceptions regarding the practicality and sustainability of technology use within instructional activities.

In addition, teachers frequently encounter operational challenges associated with technology implementation, including technical disruptions, insufficient classroom equipment, and limited technical assistance. When technological difficulties occur during instructional activities, teachers may experience frustration and reduced confidence towards future technology integration. Consequently, inadequate infrastructural support may negatively affect teachers' behavioural intention and willingness to incorporate digital technologies into regular classroom practices.

Institutional support systems also play a crucial role in shaping teachers' experiences with technology integration. School leadership, administrative encouragement, collaborative professional cultures, and access to instructional guidance may significantly influence teachers' readiness to adopt educational technologies. In schools where technology integration is actively supported through leadership initiatives and collaborative learning environments, teachers may demonstrate stronger confidence and motivation towards technology use. Conversely, limited institutional encouragement may contribute to inconsistent or minimal classroom integration practices.

These institutional and infrastructural realities suggest that technology acceptance among elementary ESL teachers cannot be examined solely through individual technological perceptions. Instead, broader organisational and contextual conditions may significantly shape teachers' experiences with technology integration in Malaysian public primary schools.

C. Professional Development and Digital Competence

Professional development and digital competence are widely recognised as essential factors supporting effective technology integration within educational settings. Existing literature consistently indicates that teachers' technological knowledge, confidence, and instructional readiness influence their ability to incorporate digital technologies meaningfully into classroom practices [16], [34].

Within Malaysian public primary schools, teachers are increasingly expected to integrate technology into instructional activities in alignment with national educational policies. However, the extent to which teachers feel prepared to implement digital technologies may vary considerably depending on their professional experiences, technological exposure, and access to training opportunities. Some teachers may possess strong digital literacy skills and confidence in utilising educational technologies, while others may continue to experience uncertainty regarding technological implementation and pedagogical application.

Existing studies suggest that many teachers continue to require sustained professional development opportunities that address both technical and pedagogical dimensions of technology integration [17]. Training programmes that focus exclusively on technical operation without addressing classroom application may not adequately prepare teachers to integrate technology effectively within instructional practices. In language education specifically, teachers

may require additional pedagogical support regarding how digital technologies can facilitate communicative interaction, language acquisition, learner engagement, and multimodal instruction.

Furthermore, digital competence among teachers should not be understood solely as the ability to operate technological tools. Effective technology integration also requires pedagogical decision-making, classroom management adaptation, instructional planning, and the ability to align digital technologies with learning objectives. Elementary ESL teachers may therefore require specialised professional support that considers both language pedagogy and primary-level instructional realities.

Workload and time constraints may also affect teachers' participation in professional development and technology integration initiatives. Teachers frequently manage multiple instructional and administrative responsibilities simultaneously, which may limit opportunities for experimentation, reflection, and sustained engagement with educational technologies. Consequently, teachers' behavioural intention towards technology integration may be influenced not only by perceptions of technology itself, but also by broader professional and institutional conditions affecting instructional practice.

D. Policy-Practice Gaps in Technology Integration

Although digital transformation policies strongly encourage technology integration within Malaysian schools, a noticeable gap often exists between policy aspirations and classroom-level implementation practices. National educational policies generally promote ambitious goals related to digital learning, technological innovation, and educational modernisation. However, the translation of these policy objectives into sustainable classroom practices may remain inconsistent across educational contexts.

Existing literature suggests that policy-driven technology initiatives may not always fully account for the practical realities encountered by teachers within everyday instructional environments [2], [37]. Teachers may experience pressure to integrate technology in response to institutional expectations and policy directives, even when infrastructural support, training opportunities, or classroom conditions remain insufficient. As a result, technology integration may sometimes become compliance-oriented rather than pedagogically meaningful.

Within elementary ESL classrooms, the policy-practice gap may become particularly evident due to the unique instructional demands associated with language learning and younger learners. Teachers may recognise the importance of technology integration while simultaneously encountering practical challenges related to classroom management, learner readiness, curriculum expectations, and technological accessibility. Consequently, technology integration practices may vary substantially despite the presence of uniform national policy objectives.

Furthermore, the implementation of technology integration initiatives often depends heavily on school-level interpretation, leadership support, and resource availability. Schools with stronger institutional support systems and collaborative professional cultures may demonstrate more effective technology integration practices compared to schools facing greater infrastructural or organisational limitations. These contextual differences further contribute to variations in teachers' technology acceptance and instructional implementation.

The existence of policy-practice gaps highlights the importance of contextualising technology acceptance frameworks within educational research. Technology integration among elementary ESL teachers should therefore be understood not only as a matter of individual technological acceptance, but also as a process shaped by institutional structures, policy environments, pedagogical realities, and classroom-level educational conditions.

V. Reconceptualising UTAUT for Elementary ESL Teachers

A. Revisiting UTAUT in Primary ESL Contexts

The Unified Theory of Acceptance and Use of Technology (UTAUT) has consistently demonstrated strong explanatory value in understanding individuals' behavioural intention towards technology use across organisational and educational contexts [21]. Within educational research, the framework has frequently been applied to examine teachers' acceptance of digital technologies, particularly in relation to instructional practices, online learning environments, and educational innovation [23], [31]. The four principal UTAUT constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions, continue to provide a useful foundation for understanding technology acceptance behaviour among educators.

However, although UTAUT has been widely utilised within educational technology research, many applications of the framework continue to prioritise generalised technological acceptance rather than context-specific instructional realities. Existing studies frequently focus on the predictive relationships between UTAUT constructs and behavioural intention without sufficiently examining how contextual educational conditions shape teachers' perceptions and technology integration practices. Consequently, technology acceptance may sometimes be interpreted primarily through technological and organisational perspectives while broader pedagogical and contextual dimensions remain comparatively underexplored.

This limitation becomes particularly relevant within elementary ESL educational settings. Unlike many higher education or secondary educational environments, elementary ESL classrooms involve unique pedagogical responsibilities associated with language acquisition, learner engagement, developmental support, classroom interaction, and communicative learning. Elementary ESL teachers are often required to integrate technology while simultaneously addressing the linguistic, cognitive, emotional, and behavioural needs of younger learners. These instructional realities may influence teachers' perceptions of technology usefulness, usability, and practicality in ways that differ substantially from other educational contexts.

For example, within elementary ESL instruction, technology integration is not solely associated with efficiency or productivity, but also with the ability to support multimodal communication, learner interaction, pronunciation modelling, collaborative engagement, and scaffolded language learning. Consequently, teachers' perceptions regarding technology usefulness may extend beyond conventional performance-related expectations commonly emphasised within generic UTAUT applications. Similarly, effort expectancy within elementary ESL contexts may involve not only technological ease of use, but also the pedagogical effort required to manage digital learning activities among younger learners.

Furthermore, social influence within primary school environments may operate differently compared to other educational settings. Elementary ESL teachers frequently function within tightly structured institutional environments characterised by curriculum expectations, school-level directives, professional collaboration, and policy-driven accountability measures. Institutional expectations and leadership practices may therefore exert considerable influence on teachers' technology integration behaviours. In some contexts, teachers may perceive technology integration as a professional expectation associated with educational modernisation rather than solely an individual pedagogical choice.

Facilitating conditions may also require broader interpretation within elementary ESL educational contexts. Existing UTAUT applications frequently conceptualise facilitating conditions primarily in terms of technical infrastructure and organisational support. However, within primary ESL classrooms, facilitating conditions may additionally involve pedagogical support, access to age-appropriate digital materials, instructional guidance, classroom management assistance, and sustained professional development opportunities specifically related to language teaching and technology integration.

These contextual realities suggest that understanding technology acceptance among elementary ESL teachers requires a more nuanced interpretation of UTAUT that incorporates pedagogical and institutional considerations alongside technological factors. Rather than viewing technology acceptance as a purely individual cognitive process, technology integration within elementary ESL classrooms should be understood as a multidimensional educational practice shaped by instructional demands, classroom realities, institutional environments, and policy expectations.

B. Contextual Dimensions Influencing Technology Acceptance

The contextual realities associated with elementary ESL instruction highlight the need to consider additional dimensions that may shape teachers' behavioural intention towards technology integration. Although the original UTAUT constructs remain highly relevant, the elementary ESL context suggests that technology acceptance may also be influenced by pedagogical readiness, institutional culture, professional expectations, and classroom-level instructional conditions.

One important contextual dimension relates to pedagogical readiness. Effective technology integration within elementary ESL instruction requires teachers to possess not only technical competence, but also the pedagogical ability to align digital technologies with communicative language teaching approaches, learner-centred practices, and developmental learning needs. Teachers may therefore evaluate technology based on its compatibility with instructional objectives, classroom interaction patterns, and language-learning activities rather than solely on perceived efficiency or ease of use.

Another important dimension involves institutional culture and school-level support. Teachers' technology acceptance behaviours are often shaped by leadership practices, collegial collaboration, administrative expectations, and professional learning environments. Schools that encourage experimentation, collaboration, and continuous professional learning may create more supportive conditions for sustainable technology integration. Conversely, institutional environments characterised by limited support or excessive performance pressures may contribute to superficial or compliance-driven technology use.

Professional workload and instructional responsibilities may also influence teachers' behavioural intention towards technology integration. Elementary ESL teachers frequently manage multiple teaching responsibilities simultaneously, including lesson preparation, classroom management, language assessment, curriculum implementation, and learner support. The integration of technology may therefore be perceived either as an instructional enhancement or as an additional professional burden

depending on contextual conditions and available support systems.

Furthermore, learner-related considerations may shape technology acceptance within elementary ESL classrooms. Younger learners often require guided interaction, scaffolded learning activities, and close instructional monitoring during digital learning activities. Teachers may therefore evaluate technology according to its suitability for learner age, language proficiency, classroom engagement, and behavioural management rather than solely based on technological functionality.

Policy implementation practices may also influence teachers' technology integration experiences. Although national educational policies strongly encourage digital learning adoption, the practical realities of classroom implementation may vary considerably across schools. Differences in technological infrastructure, internet accessibility, professional development opportunities, and institutional support systems may contribute to uneven technology integration experiences among teachers. Consequently, technology acceptance should be understood within broader educational and systemic contexts rather than solely through individual perceptions.

These contextual dimensions demonstrate that technology acceptance among elementary ESL teachers involves interactions between technological perceptions, pedagogical realities, institutional environments, and policy conditions. Accordingly, a more contextualised interpretation of UTAUT may contribute towards a deeper understanding of technology integration behaviours within Malaysian public primary schools.

C. Proposed Conceptual Extension of UTAUT in Elementary ESL Education

Based on the preceding discussion, this paper proposes that the application of UTAUT within elementary ESL educational settings should be interpreted through a broader contextual lens that incorporates pedagogical and institutional dimensions alongside the original technology acceptance constructs. While performance expectancy, effort expectancy, social influence, and facilitating conditions remain important determinants of behavioural intention, their interpretation within elementary ESL classrooms may differ from generic educational or organisational contexts.

In the proposed conceptual extension, performance expectancy should be understood not only in terms of instructional efficiency and productivity, but also in relation to pedagogical effectiveness, learner engagement, communicative interaction, and language-learning support. Elementary ESL teachers may perceive technology as valuable when it facilitates meaningful communication, multimodal instruction, collaborative learning, and learner participation rather than merely improving task completion efficiency.

Similarly, effort expectancy within elementary ESL contexts should incorporate pedagogical manageability in addition to technological usability. Teachers may evaluate digital technologies based on the instructional effort required to implement them effectively among younger learners, including classroom management considerations, learner guidance, activity preparation, and technological adaptability within language-learning environments.

Social influence should also be interpreted beyond interpersonal expectations alone. Within Malaysian public primary schools, institutional culture, policy directives, leadership expectations, and professional norms may collectively shape teachers' technology integration behaviours. Technology acceptance may therefore reflect broader educational expectations associated with digital transformation initiatives and contemporary teaching standards.

Facilitating conditions similarly require broader contextual interpretation. In addition to technical infrastructure and organisational support, facilitating conditions within elementary ESL education may involve pedagogical guidance, professional learning opportunities, access to suitable instructional resources, and institutional flexibility that supports meaningful classroom integration. Sustainable technology use is therefore likely to depend not only on technological accessibility, but also on the quality of professional and pedagogical support available to teachers.

This conceptual extension does not seek to replace the original UTAUT framework. Rather, it proposes a contextual reinterpretation that reflects the realities associated with technology integration in elementary ESL classrooms within Malaysian public primary schools. Such an interpretation acknowledges that technology acceptance within educational settings is shaped not only by technological perceptions, but also by pedagogical demands, institutional structures, and contextual educational conditions.

By extending the UTAUT perspective within elementary ESL contexts, this paper contributes towards a more context-sensitive understanding of teachers' behavioural intention to integrate technology into instructional practices. The proposed conceptual interpretation may also provide useful insights for future educational technology research, teacher professional development initiatives, and policy implementation strategies aimed at strengthening meaningful technology integration within Malaysian public primary schools.

VI. IMPLICATIONS

A. Theoretical Implications

This conceptual paper contributes to educational technology literature by extending the interpretation of the Unified Theory of Acceptance and Use of Technology (UTAUT) within elementary ESL educational contexts. Although UTAUT has been widely applied in studies examining technology acceptance among educators, many existing applications continue to emphasise predictive relationships between technological constructs and behavioural intention without sufficiently contextualising the instructional realities associated with specific educational environments [23], [31]. The present discussion therefore contributes towards a more context-sensitive interpretation of technology acceptance within primary-level language education.

The paper further highlights that technology acceptance among elementary ESL teachers should not be interpreted solely through technological or organisational perspectives. Instead, behavioural intention towards technology integration is also shaped by pedagogical expectations, classroom interaction demands, institutional culture, and contextual educational conditions. This broader interpretation extends existing UTAUT applications by demonstrating that technology acceptance within educational environments involves interactions between technological perceptions and instructional realities.

In addition, this paper contributes to the growing body of literature emphasising the importance of contextualising educational technology frameworks across different educational levels and subject-specific environments. Existing UTAUT research has frequently focused on higher education or general teaching populations, with comparatively limited emphasis on elementary ESL educational settings. By focusing specifically on elementary ESL teachers in Malaysian public primary schools, this paper responds to recent calls for more context-specific educational technology research that considers the diversity of instructional environments and pedagogical responsibilities associated with technology integration.

Furthermore, the conceptual discussion presented in this paper supports the argument that educational technology frameworks should incorporate greater consideration of pedagogical dimensions when examining teachers' technology acceptance behaviours. Technology integration within elementary ESL instruction involves communicative learning, multimodal interaction, learner engagement, and scaffolded instructional practices that may not be fully represented through generic applications of technology acceptance models. Consequently, this paper reinforces the need for future educational technology research to integrate pedagogical considerations more explicitly within technology acceptance investigations.

B. Practical Implications

The discussion presented in this paper also offers several practical implications for educators, school administrators, and teacher professional development providers. First, the findings suggest that effective technology integration within elementary ESL classrooms requires more than technological accessibility alone. Teachers require sustained pedagogical and professional support that enables them to integrate digital technologies meaningfully into language instruction rather than using technology merely for administrative or superficial instructional purposes.

Professional development initiatives should therefore focus not only on technical training, but also on pedagogical application within ESL instructional contexts. Teachers may benefit from professional learning opportunities that demonstrate how digital technologies can support communicative language teaching, learner interaction, collaborative learning, and multimodal instructional strategies appropriate for younger learners. Such training should be continuous, contextually relevant, and aligned with classroom-level instructional realities.

The paper also highlights the importance of institutional support systems in strengthening teachers' behavioural intention towards technology integration. School leaders and educational administrators play a significant role in shaping institutional cultures that encourage collaboration, experimentation, and professional confidence in technology use. Supportive leadership practices, collaborative professional learning communities, and accessible technical assistance may contribute positively towards sustainable technology integration within primary school environments.

In addition, the paper suggests that educational technologies implemented within elementary ESL classrooms should be selected carefully according to pedagogical suitability and learner developmental needs. Technologies that support interactive communication, learner engagement, multimodal instruction, and scaffolded learning experiences may be more appropriate within primary-level language learning environments. Consequently, technology implementation strategies should prioritise pedagogical relevance rather than focusing exclusively on technological advancement or policy compliance.

C. Policy Implications

Several policy implications also emerge from the present discussion. Although national educational policies in Malaysia strongly promote digital transformation and technology integration within schools, the effectiveness of these initiatives may depend heavily on how policies are implemented

within classroom-level instructional environments. The existence of policy-practice gaps suggests that educational policies should account more explicitly for contextual realities encountered by teachers within diverse school settings.

Policy initiatives related to technology integration should therefore move beyond infrastructure provision alone and place greater emphasis on sustained professional development, pedagogical support, and institutional readiness. While technological infrastructure remains important, effective classroom integration also requires supportive organisational conditions, manageable teacher workloads, and access to instructional guidance that aligns with teachers' professional responsibilities.

The paper further suggests that technology integration policies should recognise the distinct instructional demands associated with elementary ESL education. Primary-level language learning environments involve different pedagogical considerations compared to secondary or tertiary educational contexts, particularly regarding learner engagement, classroom interaction, and developmental support. Consequently, policy implementation strategies should be sufficiently flexible to accommodate context-specific instructional needs within elementary classrooms.

Additionally, policymakers should consider the importance of reducing disparities in technological accessibility and institutional support across schools. Uneven infrastructure, inconsistent internet connectivity, and variations in professional support may contribute to unequal technology integration experiences among teachers and learners. Strengthening equitable access to technological resources and professional support systems may therefore enhance the sustainability and effectiveness of digital learning initiatives within Malaysian public primary schools.

Overall, the implications presented in this paper reinforce the importance of adopting a more contextualised and pedagogically informed approach towards technology integration in elementary ESL education. Sustainable technology adoption is likely to depend not only on technological availability, but also on the broader educational conditions shaping teachers' experiences, perceptions, and instructional practices.

VII. Future Research Directions

Existing research on technology acceptance in education continues to expand across diverse educational settings. Nevertheless, several gaps remain evident within the literature concerning elementary ESL teachers and technology integration in primary educational environments. The present conceptual discussion therefore suggests several important directions for future research.

First, future studies should place greater emphasis on elementary and primary school contexts within educational technology research. Much of the existing UTAUT-based literature continues to focus on higher education institutions, secondary schools, or general teaching populations [23], [31]. Consequently, further investigation is needed to understand how technology acceptance operates within primary-level instructional environments where pedagogical demands, learner characteristics, and classroom management realities differ substantially from other educational settings.

Second, future research should incorporate more context-sensitive approaches when examining teachers' technology acceptance behaviours. Existing studies frequently emphasise predictive relationships between technological constructs and behavioural intention while providing comparatively limited exploration of the institutional, pedagogical, and classroom-level conditions influencing technology integration. Future investigations may therefore benefit from examining how contextual dimensions such as institutional culture, leadership practices, professional workload, learner readiness, and pedagogical expectations shape teachers' technology acceptance within elementary ESL classrooms.

Third, there is a need for more qualitative and mixed-methods research exploring teachers' lived experiences with technology integration. Although quantitative studies continue to provide valuable insights regarding relationships between UTAUT constructs and behavioural intention, qualitative approaches may offer deeper understanding of how teachers interpret, negotiate, and implement technology within real classroom environments. Interviews, classroom observations, and reflective narratives may therefore contribute towards richer contextual understanding of technology integration practices among elementary ESL teachers.

Future research may also explore the interaction between technology acceptance frameworks and pedagogical models such as Technological Pedagogical Content Knowledge (TPACK), Communicative Language Teaching (CLT), or learner-centred instructional approaches. Integrating technology acceptance perspectives with pedagogical frameworks may provide a more comprehensive understanding of how technological, instructional, and contextual dimensions collectively influence classroom technology integration practices.

In addition, comparative studies across different school settings, geographical locations, and educational systems may contribute towards broader understanding of contextual influences on teachers' behavioural intention towards technology use. Differences between rural and urban schools, resource-rich and resource-limited environments, or varying institutional support systems may reveal

important contextual variations in technology acceptance and instructional implementation.

Longitudinal research designs may further strengthen understanding of how teachers' behavioural intention and technology integration practices evolve over time. Teachers' perceptions towards educational technology may change as they gain greater technological experience, professional exposure, and institutional support. Consequently, longitudinal investigations may provide valuable insights regarding the sustainability and long-term development of technology integration practices within elementary ESL educational environments.

Overall, future educational technology research should continue moving towards more contextually grounded and pedagogically informed approaches that recognise the complexity of technology integration within elementary ESL classrooms. Such investigations may contribute towards the development of more responsive educational policies, professional development initiatives, and instructional support systems that strengthen meaningful technology integration practices in Malaysian public primary schools.

VIII. Conclusion

Technology integration has become an increasingly important component of contemporary educational practice, particularly within language education where digital technologies may support communication, collaboration, learner engagement, and multimodal learning experiences. Within Malaysian public primary schools, educational policies and digital transformation initiatives have further strengthened expectations for teachers to incorporate technology into instructional practices. Nevertheless, meaningful technology integration within elementary ESL classrooms remains influenced by multiple pedagogical, institutional, and contextual realities that shape teachers' behavioural intention towards technology use.

This conceptual paper discussed the application of the Unified Theory of Acceptance and Use of Technology (UTAUT) within elementary ESL educational settings and argued for a more contextualised interpretation of technology acceptance among teachers in Malaysian public primary schools. Although UTAUT continues to provide a valuable framework for examining behavioural intention towards technology integration, existing applications frequently emphasise technological and predictive dimensions while providing comparatively limited attention to contextual instructional realities associated with elementary ESL education.

The discussion highlighted that technology acceptance among elementary ESL teachers should be understood not only through perceptions of usefulness, ease of use, social influence, and facilitating conditions, but also through broader pedagogical and institutional considerations. Factors such as classroom interaction demands, learner developmental needs, professional workload, institutional culture, leadership support, and policy implementation practices may significantly shape teachers' experiences with technology integration. Consequently, technology acceptance within elementary ESL classrooms should be interpreted as a multidimensional educational process rather than solely a technological adoption behaviour.

This paper further proposed a contextual extension of UTAUT that incorporates pedagogical and institutional dimensions alongside the framework's original constructs. Such an interpretation contributes towards a more nuanced understanding of technology integration within primary-level ESL educational environments and responds to growing calls for context-sensitive educational technology research.

Overall, the paper contributes to the literature by reconceptualising technology acceptance within elementary ESL education and emphasising the importance of contextual realities in shaping teachers' behavioural intention towards technology integration. It is hoped that the discussion presented in this paper may support future educational technology research, teacher professional development initiatives, and policy implementation efforts aimed at strengthening meaningful and sustainable technology integration practices within Malaysian public primary schools.

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