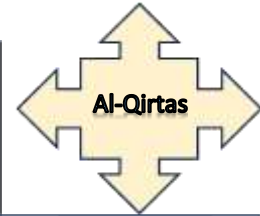


Investigating Challenges of Technological Integration in the English Language Classrooms in Sindh, Pakistan



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Abstract

This study investigates the challenges and solutions associated with incorporating technology into undergraduate English language classes at Mehran University of Engineering and Technology (MUET) and Shah Abdul Latif University (SALU) in Sindh, Pakistan. Through qualitative analysis of semi-structured interviews with 10 English language educators and quantitative data gathered from a survey of 200 undergraduate students, this research identifies critical barriers, including inadequate digital literacy among instructors, limited access to high-quality software, and infrastructural deficiencies. Findings underscore the necessity for targeted interventions such as comprehensive teacher training programs and curriculum revisions aligned with technological advancements. Strategies to foster positive attitudes towards technology adoption and optimize resource management are highlighted, emphasizing robust infrastructure and student-centered learning approaches. Recommendations include prioritizing technology infrastructure investment, continuous professional development for educators, and cultivating a supportive environment conducive to effective technology integration in English language education. By overcoming these issues and putting recommended strategies into practice, educators may improve student learning outcomes, encourage digital literacy, and get them ready for success in the digital age.

Keywords: Technology integration, Digital literacy, Undergraduate students, Challenges, Strategies, Educational technology, Teacher training, Student perceptions

Introduction:

The integration of digital technology into educational practices has revolutionized teaching and learning paradigms worldwide, presenting both opportunities and challenges, particularly in English language education contexts such as Sindh, Pakistan. This article explores the complexities surrounding the adoption of technology in English language classrooms in Sindh, highlighting barriers and proposing strategies for effective integration founded on an in-depth analysis of pertinent scholarly works and empirical discoveries. Sindh, as a province within Pakistan, faces a myriad of challenges in its educational landscape, including infrastructural limitations, socio-economic disparities, and varying levels of digital literacy among educators and students (Bilal & Khan, 2018; Jaffer & Basher, 2021). These factors significantly influence the seamless incorporation of technology into teaching practices, particularly in disciplines like English language education, where digital tools can potentially enhance engagement, facilitate interactive learning experiences, and expand access to global educational resources (Kukulka-Hulme, 2012).

The effective deployment of technology in English language classrooms requires a nuanced understanding of local contexts and educational needs (Warschauer, 2010). While digital technologies offer innovative approaches to language teaching, their implementation in Sindh is hindered by inadequate infrastructure, including unreliable electricity and limited internet connectivity (UNESCO, 2020). Such challenges restrict access to online resources and communication platforms essential for language learning (Alam, 2019). Educators' digital literacy and proficiency in utilizing educational technology emerge as critical factors influencing successful integration efforts (Farooq & Majeed, 2017). Teachers' abilities to effectively integrate technology into pedagogical practices are often constrained by insufficient training and support mechanisms (Khan & Naqvi, 2019). Furthermore, ensuring alignment between technological initiatives and curriculum objectives is essential to maximize the benefits of digital tools in enhancing language proficiency and student outcomes (Means et al., 2010). In today's rapidly advancing digital age, modern learning settings are largely shaped by the integration of technology into education. This research delves into the specific challenges faced by Pakistani students and teachers in incorporating technology into undergraduate English language classrooms at public universities in Sindh, Pakistan. Although technology has many potential applications in education, its successful use is still a challenging task, especially in settings as diverse and resource-constrained as Pakistani higher education.

Problem Statement

There are several obstacles in Pakistan's English language education system when it comes to integrating digital technology. Common constraints include things like restricted computer and internet access, low digital literacy among teachers and pupils, and reluctance to embrace new technology (Dusick, 1998). These difficulties highlight the necessity of doing a thorough investigation into the most efficient ways to use technology to improve instruction and learning in English language classrooms.

Rationale

Understanding how digital tools can aid and modify educational practices is crucial, which is why the researcher is motivated to do this research as a linguistics student who is intimately involved in the interface of language acquisition and technology. In Pakistani universities, where ICT adoption is

uneven and frequently impeded by insufficient infrastructure, exploring strategies to overcome these barriers becomes imperative (Ghavifekr et al., 2016). This study seeks to provide insights that empower educators to navigate these challenges and optimize the use of technology in English language instruction.

Background

Technology, defined by researchers like Mohammad Reza Ahmad (2018), encompasses the application of knowledge and technical processes to perform tasks. In educational contexts, technological advancements have revolutionized teaching methodologies, making learning more interactive, personalized, and accessible (Gilakjani, 2017). For English language education in Pakistan, the integration of multimedia tools and internet-based applications holds promise in enhancing engagement and improving language acquisition outcomes (Aziz et al., 2020).

Aims & Objectives

This study aims to address the following objectives:

1. Investigate the primary challenges encountered by teachers and students when integrating technology into undergraduate English language classrooms.
2. Provide practical insights into how English language teachers and students can enhance their digital literacy skills at the undergraduate level.

Research Questions

To guide this investigation, the study poses the following research questions:

RQ1: What are the key challenges faced by teachers and students in integrating technology into undergraduate English language classrooms in Sindh, Pakistan?

RQ2: How can English language teachers and students improve their digital literacy skills to effectively integrate technology in their teaching and learning practices?

Significance of the Study

The findings of this study have important implications for administrators, teachers, and students at Sindh University in Pakistan. The study intends to influence practice and policy in English language teaching by identifying obstacles and providing suggestions for efficient technology integration. Improving digital literacy and efficiently utilising technology have the potential to improve instructional approaches and educational results in the area.

Literature Review:

A critical synthesis of earlier research and scholarly papers on a certain topic is what a literature review is. It provides an extensive overview of the current state of knowledge, identifies any gaps, and establishes the framework for further research. This analysis examines various frameworks, instructional strategies, governmental regulations, stakeholder responsibilities, challenges, and approaches related to the integration of technology in education. By looking at these areas, the evaluation aims to provide light on the advantages and disadvantages of utilising technology to enhance educational performance.

Technology Integration

Definition and Models: Technology integration in education is the process of enhancing teaching and learning processes via the use of technological tools and resources. A variety of frameworks, such as

the SAMR model (Substitution, Augmentation, Modification, Redefinition) and the TPACK framework (Technological Pedagogical Content Knowledge), offer frameworks for comprehending how technology can be successfully integrated into various subject areas and instructional contexts. The SAMR model, for example, divides the use of technology into four categories: modification (significantly redesigning tasks with technology), augmentation (using technology to enhance traditional methods), and redefinition (creating new tasks that were previously inconceivable without technology). (Puentedura, 2006).

Benefits: Research has highlighted several advantages of technology integration in education. These include increased student engagement, personalized learning experiences, improved collaboration among students, enhanced access to resources and information, and opportunities for differentiated instruction (Zhao et al., 2002).

Technology Integration in English Language Classrooms

Pedagogical Approaches: In the context of English language teaching, technology can facilitate language acquisition through multimedia resources, online collaboration tools, language learning apps, and digital storytelling platforms. For example, digital tools enable students to practice listening, speaking, reading, and writing skills in interactive and authentic contexts (Warschauer, 2006).

Case Studies: Case studies from various ESL/EFL classrooms demonstrate successful integration of technology, such as using video conferencing for language exchanges, digital portfolios for writing practice, and pronunciation apps for self-paced learning (Hubbard, 2008).

Government Policy and History of Technology in Education in Pakistan

Policy Analysis: The Pakistani government has developed a number of guidelines to encourage the use of technology in the classroom with the goal of improving education quality, equity, and accessibility nationwide. Policies often focus on infrastructure development, teacher training in ICT skills, curriculum reform to include digital literacy, and initiatives for digital inclusion in marginalized communities (UNESCO, 2020).

Impact of Policies: These policies have influenced the adoption of technology in Pakistani schools, though challenges such as infrastructure limitations and socio-economic disparities persist. The National Education Policy of 2017, for example, describes objectives for utilising ICT to enhance learning results and get students ready for the digital era (Ministry of Federal Education and Professional Training, Pakistan).

Role of Teachers in Integrating Technology

Teacher Training: Effective integration of technology depends significantly on teachers' pedagogical beliefs and their proficiency in using educational technologies. According to Ernst (2005), professional development programmes play a critical role in providing educators with the skills and self-assurance needed to effectively incorporate technology into their teaching practices.

Barriers and Facilitators: Common barriers to technology integration include lack of time, inadequate resources, resistance to change, and insufficient training. Strategies to overcome these barriers include ongoing support through mentoring, collaborative planning among teachers, and creating a positive school culture that values innovation (Mouza, 2008).

Role of Students in Technology Integration

Student Engagement: Students play an active role in technology-rich environments by collaborating on projects, conducting research using online resources, and participating in interactive simulations and virtual labs. Technology enables them to take ownership of their learning and engage in self-directed inquiry (Christensen & Knezek, 2008).

Digital Citizenship: Students must be taught about the ethical and appropriate use of technology, as well as concerns about copyright laws, digital privacy, and cyberbullying (Ribble, 2015). Gaining proficiency in digital literacy enables students to safely and ethically traverse the digital landscape.

Current Utilization of Technology in Education

Global Trends: Technology trends in education include the rise of learning analytics, personalized learning platforms, adaptive learning technologies, and the integration of AI and machine learning to enhance teaching and learning experiences (Siemens, 2013).

Emerging Technologies: Technological innovations such as artificial intelligence (AI), virtual reality (VR), and augmented reality (AR) present fresh possibilities for personalised feedback systems, virtual simulations, and immersive learning experiences that are tailored to the needs of each individual student (Dennen, 2009).

Technology Use in Language Classrooms

Effective Practices: Technology enhances language learning through authentic communication opportunities, multimedia language resources, and online language communities. It supports language acquisition by providing interactive exercises for grammar and vocabulary practice and authentic materials for cultural understanding (Meskill, 2005).

Digital Literacies: Teaching digital literacy skills in language classrooms involves helping students critically evaluate online information, communicate effectively in digital environments, and navigate digital tools for language learning purposes (Kessler, 2010).

Theoretical framework

Building on the Technology Acceptance Model (TAM), the theoretical framework put forward by Venkatesh and Davis (2000) offers a thorough knowledge of the variables impacting teachers' adoption and usage of new technologies in educational contexts. Let's relate this paradigm to the context of technology integration in Sindh, Pakistani English language schools.

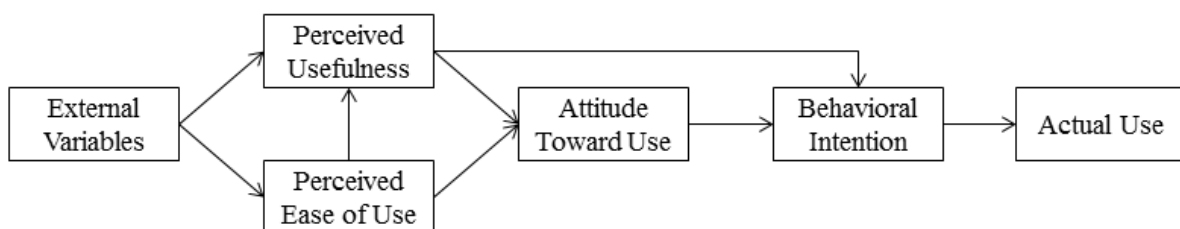


Figure 1. A theoretical extension of the technology acceptance model as TAM2 (Source: Venkatesh & Davis, 2000)
Application to Integrating Technology in English Language Classrooms

External Variables:

Limited Accessibility and Network Connection: In Sindh, Pakistan, many educational institutions face challenges with unreliable internet connectivity and inadequate ICT facilities. This external barrier significantly impacts the integration of technology into teaching practices.

Lack of Effective Training: Teachers often lack comprehensive training in using educational technologies effectively. This deficit hampers their ability to leverage ICT tools to enhance teaching and learning.

Limited Time: Teachers in Sindh may already be burdened with heavy workloads, leaving limited time for learning and integrating new technologies into their teaching routines.

Lack of Teachers' Competency: A significant number of educators may not possess sufficient digital literacy skills necessary for navigating and utilizing ICT tools in educational contexts.

Perceived Usefulness (PU):

Teachers' perceptions of how ICT tools can enhance their job performance and facilitate better learning outcomes for students are crucial. If teachers perceive that technology can improve efficiency, effectiveness, and productivity in teaching English language skills, they are more likely to adopt and integrate these tools.

Factors contributing to perceived usefulness include the ability to work more rapidly, perform better on the job, produce more, and transmit instructional content more effectively overall.

Perceived Ease-of-Use (PEOU):

Teachers' perceptions of how easy it is to learn and use ICT tools play a pivotal role in their adoption decisions. Clear and understandable interfaces, ease of use, controllability, and ease of learning contribute to teachers' perceptions of the ease-of-use of these technologies.

In Sindh, ensuring that ICT tools are user-friendly and accompanied by adequate support and training can mitigate perceived difficulties in adoption due to ease-of-use concerns.

Attitude Toward Use:

Teachers' opinions about the ease of use and usefulness of ICT tools affect how they feel about using them in English language classes. Optimistic mindsets are fostered when teachers perceive ICT as beneficial to their teaching practices and conducive to student learning.

Addressing external barriers and enhancing perceptions of usefulness and ease-of-use can positively influence teachers' attitudes towards technology adoption.

Behavioral Intention:

The intention of teachers to adopt and use ICT tools is shaped by their attitudes, perceived utility and usability. Teachers' deliberate plans and readiness to integrate technology into their lesson plans are reflected in their behavioural intentions.

Social Influence and Instrumental Cognitive Processes:

Social factors such as subjective norms (peer influence), voluntariness (autonomy in decision-making), and image (professional reputation) contribute to teachers' perceptions of the usefulness and intention to use ICT tools.

Teachers' attitudes and actions regarding the use of technology are further influenced by cognitive instrumental processes, such as perceived ease-of-use, work relevance, output quality, and outcome demonstrability.

Challenges of Technology Integration

Common Challenges: Integrating technology into education faces several challenges, ranging from technical and infrastructure issues to pedagogical and cultural barriers. These challenges include:

Infrastructure Limitations: Insufficient access to reliable internet connectivity and hardware devices in schools can hinder effective technology integration (UNESCO, 2020).

Digital Divide: Socio-economic disparities lead to unequal access to technology resources among students, affecting their learning opportunities (Warschauer, 2007).

Resistance to Change: Teachers and administrators may resist adopting new technologies due to concerns about workload, lack of familiarity, or skepticism about the benefits (Cuban, 2001).

Lack of Professional Development: Inadequate training and support for teachers in using educational technologies effectively can impede integration efforts (Mouza, 2008).

Privacy and Security Concerns: Issues related to student data privacy, cybersecurity threats, and ethical use of technology require careful consideration (Ribble, 2015).

Techniques for Overcoming Obstacles: Overcoming these obstacles calls for a multidimensional strategy that involves legislative changes, focused infrastructure expenditures, professional development programmes, and encouraging an innovative culture in schools.

Successful strategies include:

Policy Support: Governments can play a crucial role in providing funding, developing comprehensive ICT policies, and advocating for digital literacy initiatives (Ministry of Federal Education and Professional Training, Pakistan).

Community Engagement: Involving parents, students, and local communities in technology integration efforts can enhance support and sustainability (Zhao et al., 2002).

Continuous Professional Development: Offering ongoing training opportunities, mentoring programs, and collaborative learning communities for teachers can build their confidence and competence in using technology (Ertmer, 2005).

Equity and Access Initiatives: Implementing initiatives to bridge the digital divide by providing equitable access to technology resources for all students (Warschauer, 2007).

Research and Evaluation: Conducting research on the impact of technology integration and regularly evaluating implementation strategies can inform best practices and evidence-based decision-making (Siemens, 2013).

Hypotheses:

In an independent samples t-test, the hypotheses typically relate to the comparison of means between two independent groups. Here's how the hypotheses are formulated:

Null Hypothesis (H₀): The null hypothesis states that there is no significant difference between the challenges faced by teachers and students in general and engineering universities when integrating technology in English language classrooms at the undergraduate level.

H₀: $\mu_1 = \mu_2$

This means that the population means (μ) of Group 1 and Group 2 are equal. If the p-value is greater than 0.05, we consider the results not statistically significant.

Alternative Hypothesis (H1 or Ha): The alternative hypothesis contradicts the null hypothesis by proposing that there is a difference in the challenges faced by general and engineering university teachers and students while integrating technology in the English language classrooms at the undergraduate level.

H1: $\mu_1 \neq \mu_2$

This suggests that the population means (μ) of Group 1 and Group 2 are not equal. If the p-value is less than 0.05, we consider the results statistically significant.

Research Methodology

Research Design

A mixed-methods research methodology is used in this study to combine qualitative and quantitative techniques in order to provide a thorough understanding of the difficulties and effects associated with incorporating digital technology into English language instruction.

Qualitative Component: Semi-structured interviews with teachers

Quantitative Component: Questionnaire survey with students

Participants

Participants: 200 undergraduate students (first and second year) and 10 English language teachers from Shah Abdul Latif and Mehran University.

Questionnaire

Design: Adapted from Oguzhan Atabek (2019) and Muhammad Mooneeb Ali (2016), the questionnaire explores students' perceptions of digital technology integration, focusing on their attitudes, motivation, and participation in English language classes.

Content: Questions cover areas such as access to technology, perceived benefits, challenges faced, and recommendations for improvement.

Administration: Google Forms was utilized for online data collection, comprising 32 items designed to gather structured responses from students.

Semi-Structured Interviews

Participants: 10 English language teachers from Shah Abdul Latif and Mehran University.

Design: Semi-structured interviews allow for in-depth exploration of teachers' experiences, challenges, and strategies regarding technology integration.

Topics: Interviews cover themes such as pedagogical practices, digital literacy, technological challenges, and training needs.

Data Collection: Data collection involved conducting interviews in-person or via phone calls with English language teachers to capture detailed insights and perspectives.

Data Analysis

Quantitative Data Analysis: Quantitative analysis focused on key statistical measures:

Mean: Calculated to determine the average score of each group.

Standard Deviation (STD.D): Assessed variability within the scores, indicating consistency or dispersion.

Significance (SIG, 2-tailed): Conducted a two-tailed t-test to identify statistically significant differences between groups, using a p-value threshold of <0.05.

Comparative Analysis

The results indicated differences in performance levels and consistency among both universities, with significance tests confirming the robustness of these findings.

Qualitative Data Analysis: Involves thematic analysis to find recurrent themes and trends in the transcripts of teacher interviews. Themes could be things like teaching techniques, technological obstacles, and suggestions for development.

Data analysis:

Comparative Analysis

Here's a comparative analysis of students from Shah Abdul Latif University (SALU) and Mehran University of Engineering and Technology (MUET), specifically from their Social Science departments and Engineering departments respectively:

Measure of central Tendency (mean) and Measure of Spread (St. Deviation) have been compared of two universities.

RQ1: What are the issues and challenges faced by teachers and students while integrating technology in the English language classrooms at undergraduate level?

S:NO	ITEM	MEAN	STD.D	SIG (2-TAILED)
1	Incompetence regarding the effective use of information technologies is one of a barrier of integrating technology.	3.59	1.162	.952
2	Lack of sufficient evaluation of students' use of information technology.	3.55	1.151	.903
3	Corporate culture in educational institutions conduces to resistance to new technologies.	3.61	1.160	.715
4	Availability of high quality softwares are always challenging in language class rooms.	3.51	1.203	.558
5	Negative attitude towards information technologies is one of a barrier.	3.82	1.251	.367
6	Lack of content support certain technologies like tablet computer	3.88	1.084	.745
7	Anti-virus and other language related softwares are not up to date.	3.48	1.204	.291
8	Lack of information technology solutions that are sensitive to individual differences of students.	3.66	1.118	.513

9	Lack of sufficient information technology solutions that educators can use for evaluation and assessment.	3.47	1.118	.636
10	Availability of computers is less as compared to the students.	3.86	1.190	.824
11	Load shading affects the continuity of technology integration in classroom.	3.90	1.264	.640
12	Multimedia network computers are mostly unavailable for the provision of communication.	3.65	1.206	.908
13	Online tools are not easily available in language class rooms.	3.69	1.213	.712
14	Computer technicians are not available always to coup with any issue created.	3.70	1.143	.460
15	Inappropriateness of the curriculum for effective use of information technologies.	3.69	1.145	.628
16	Developing materials by using information technologies takes too much time.	3.19	1.307	1.000
17	lack of sufficient education in teacher training institutions about effective use of information technologies is a barrier faced by students and teachers	3.88	1.197	.119
18	slow internet connection is indicated as one of the major barriers faced by students and teachers.	4.16	1.086	.623
19	insufficiency of physical infrastructure of educational institutions.	3.61	1.147	.768
20	Lack of freely available content which is appropriate for effective use for educational purposes.	3.38	1.196	.015
21	lack of some features of older technologies in newer ones.	3.38	1.196	.002
22	Compared with older technologies, new ones require constantly learning.	3.33	1.265	.012
23	New technologies are not as simple and easy to understand as older technologies.	2.39	1.190	.024

RQ2: How English language teachers and Students can improve their digital literacy undergraduate level?

S:NO	ITEM	MEAN	STD.D	SIG (2-TAILED)
24	The Ministry of Education should increase new technology integration in curriculum that enables students and teachers to train in a range of independent, flexible situations.	3.98	1.084	.435
25	The incorporation of cognitive methods into practise that allows students to develop, create, and demonstrate	3.88	1.042	.839

	themselves increases the value of creative outcomes and processes.			
26	To enjoy the benefits of technological advances in education, teachers must be willing and capable of using it successfully. Instead of lecturing pupils.	3.81	1.127	.260
27	A teacher's responsibility should be to guide them in ways that will allow them to explore as they work (either independently or with other students) (Bui, 2022).	3.95	1.081	.267
28	Teachers used a number of methods, including the use of computer technology, to enable students to learn creatively.	3.96	.999	.525
29	Teachers should be encouraged for using technology as a creative teaching method,	4.00	1.008	.327
30	The focus on providing Internet access and devices for learners should not overshadow the importance of preparing teachers to teach effectively with technology.	3.98	1.167	.304
31	Students need to be taught the digital skills that apply to the learning environment to ensure they have the skills for employment	3.95	1.090	105
32	Students (and teachers) need to be thoroughly taught how to use learning and teaching digital infrastructure, and some respondents expressed that their learning management system needs to be much simpler or of better quality.	3.94	1.143	.853

The analysis of the survey data from both universities' general and engineering departments identified significant challenges regarding the integration of technology. Out of a total of 31 items, only these items demonstrated statistically significant barriers:

Significant Findings in RQ1:

- Lack of freely available content: $p = 0.015$
- Lack of features of older technologies: $p = 0.002$
- Constant learning required for new technologies: $p = 0.012$
- New technologies are not easy to understand: $p = 0.024$

In contrast, RQ2 revealed no items that reached the significance threshold, indicating that while there are areas for improvement, there are no statistically significant challenges identified at the undergraduate level.

Overall, the majority of items showed no significant differences in challenges faced regarding technological integration between the two universities. This indicates that the null hypothesis cannot be rejected, suggesting a similarity in the challenges experienced across the departments. Thus, both universities encounter comparable obstacles when integrating technology, highlighting a consistent landscape of challenges across these academic settings.

R Thematic Analysis

This study used a mixed-method approach in response to the need for more accurate and

comprehensive results. Similarly, the qualitative data has been collected in accordance with the general guidelines for thematic analysis in qualitative research, which calls for the researcher to first gather the data before becoming acquainted with it in order to identify themes and codes for further explanation.

S.N O.	THEMES	SUB-THEMS	SAMPLE RESPONSES
1.	Technology tools	Insufficient number of computers	<p>T1: No student owns a personal computer.</p> <p>T2: Another factor that makes it harder to use technology as a teaching and learning tool is the scarcity of facilities.</p> <p>T3: The issue is that not many pupils can afford the high cost of technology these days.</p> <p>T4: Due to the high cost of computers, students do not have access to technology.</p>
2.	Teachers training	Insufficiency of in-service training programs	<p>T1: In order to be able to use a new technology while instructing our pupils, we require training. A lot of teachers lack this knowledge because they haven't received the necessary training.</p> <p>T2: Insufficient teacher preparation. Without training, how can we use technology in the classroom? Training is essential since it not only demonstrates our technological proficiency but also maintains our knowledge and skills up to date and increases our confidence when we stand in front of the class.</p> <p>T3: A deficiency in professional development and training is the most frequent cause of the absence of technology integration in English language instruction.</p> <p>T4: Those without training have two options: they can use technology at their current proficiency level or put it off until they feel they are competent enough. Training and support from educational officials are required to raise instructors' confidence in the process and help them acquire the knowledge they need.</p>
3	Internet connection	Insufficiency of internet connection	<p>T1: When the Wi-Fi is disconnected, there is an issue. On the other hand, because they are accustomed to using technological resources, pupils can personally solve other issues. The technological issues are the only source</p>

			of the issue. T2: Students occasionally have slow internet connections or no data connections at all.
4	Negative attitude	Negative psychological state	T2: Since many pupils lack technological proficiency, they develop unfavourable opinions on it. T1: One problem with integrating technology in the classroom is a negative attitude towards digital devices.
5	Technology recourse	Insufficiency of resources	T1: There are occasions when load shading issues arise, which compromises the smooth operation of technology integration in the classroom by turning off the lights in the middle of power point lectures or student presentations. T2: Multimedia and projectors aren't operating correctly. T3: There aren't many projectors available, and occasionally they don't function properly. Technology technicians aren't always available to fix these problems.
6	Valuing new technology	Aware students about benefits	T1: Since using technology requires learning something new, which takes time and effort, some students are reluctant to use it. On the other hand, we can begin teaching them by outlining some possible advantages that affect consumers individually in addition to them. T2: To fully profit from technological improvements in education, teachers must be able and ready to employ technology in the classroom. as opposed to lecturing students. T3: Teachers supported students' creative learning through a variety of strategies, including the use of computers.

Result and Discussion

This section provides a thorough examination of the quantitative results from the Mehran University of Engineering and Technology (MUET) and Shah Abdul Latif University (SALU) study on integrating technology in English language classrooms. In order to improve digital literacy among students and instructors, the research sought to identify the main issues and tactics related to the adoption of technology. It also offered insights into the obstacles that prevent effective integration

and suggested solutions. The discussion delves into critical issues such as competence in using information technologies, availability of high-quality software, negative attitudes towards technology, and infrastructural constraints. Additionally, it examines strategies focused on promoting creative technology use, integrating cognitive methods, and enhancing digital skills relevant to employment. By prioritizing these findings, educational institutions can develop targeted interventions to overcome challenges and foster a conducive environment for leveraging technology in educational practices. The following sections detail the results and discuss their implications for policy, practice, and future research.

Research Question 1: Issues in Integrating Technology

Challenges Identified:

Incompetence in Using Information Technologies: The most significant barrier identified across both Shah Abdul Latif University (SALU) and Mehran University of Engineering and Technology (MUET) is the incompetence regarding the effective use of information technologies (mean 3.59, std.d 1.162). This indicates a critical need for targeted training and support to enhance faculty and student competencies in utilizing technology for educational purposes.

Availability of High-Quality Software and Tools: Both universities face challenges in accessing high-quality software essential for effective teaching in language classrooms (mean 3.51, std.d 1.203). This issue underscores the importance of improving software availability and ensuring that educators have access to updated and suitable tools for educational use.

Negative Attitudes Towards Information Technologies: SALU reported a prevalent negative attitude towards information technologies among faculty and students (mean 3.82, std.d 1.251), which is a crucial barrier to technology integration. Addressing these negative perceptions through awareness and training initiatives is essential to fostering a positive environment for technology adoption.

Technical Support and Infrastructure: Issues such as slow internet connections, inadequate availability of computers relative to student numbers, and insufficient technical support were prominent (mean 3.90, std.d 1.264). These infrastructure challenges need urgent attention to provide a conducive environment for effective technology integration in education.

Research Question 2: Strategies to Improve Digital Literacy

Strategies Identified:

Encouraging Creative Use of Technology: Both SALU and MUET emphasize the importance of encouraging educators to creatively integrate technology into teaching practices (mean 4.00, std.d 1.008). This approach aims to enhance student engagement and foster innovative learning experiences.

Integration of Cognitive Methods: There is a consensus at both universities on the integration of cognitive methods that allow students to develop, create, and demonstrate their learning through digital platforms (mean 3.98, std.d 1.084). This strategy aims to elevate the standard of instruction and equip learners for obstacles ahead.

Enhancing Digital Skills Relevant to Employment: Both universities recognize the importance of equipping students with digital skills that are directly applicable to their future careers (mean 3.95, std.d 1.090). This includes proficiency in using learning management systems and other digital tools critical for professional development.

Common Strategies:

Curriculum Integration: Both SALU and MUET stress the need for curriculum revisions that seamlessly integrate new technologies (mean 3.98, std.d 1.167). This involves updating course materials to incorporate digital tools and resources that enhance learning outcomes and student participation.

Training and Support for Educators: Providing comprehensive training and ongoing support for educators is crucial to ensuring they are proficient in utilizing technology for teaching (mean 3.96, std.d 0.999). Professional development programs should focus on enhancing pedagogical skills and digital literacy among faculty.

Accessibility of Digital Tools: Ensuring equitable access to digital tools and resources is essential for both universities (mean 3.94, std.d 1.143). This includes improving infrastructure and providing adequate resources to facilitate effective teaching and learning experiences.

Prioritization of Issues for Resolution:

Based on the highest mean results and critical analysis, the following issues should be prioritized for resolution:

Incompetence in Using Information Technologies: Addressing the competence gap among faculty and students by implementing targeted training programs and workshops focused on enhancing digital literacy and proficiency.

Negative Attitudes Towards Information Technologies: Initiating awareness campaigns and professional development activities to foster a positive attitude towards technology adoption among faculty and students at SALU.

Technical Support and Infrastructure: Improving infrastructure facilities such as internet connectivity, availability of computers, and timely technical support services to create a conducive environment for technology-enhanced learning.

Curriculum Adaptation: Revising the curriculum to incorporate digital tools and methods effectively, ensuring alignment with educational objectives and enhancing student engagement and learning outcomes.

By prioritizing these issues, SALU and MUET can effectively address the challenges identified in integrating technology into English language classrooms and improve digital literacy among undergraduate students and educators.

Result and Discussion

This section presents a qualitative analysis focusing on the challenges and opportunities associated with integrating technology in English language classrooms at Shah Abdul Latif University (SALU) and Mehran University of Engineering and Technology (MUET). The qualitative findings give more detailed information about the attitudes, beliefs, and experiences of stakeholders—students and teachers—about the use of technology in the classroom. The thematic analysis explores key themes such as insufficient technology resources, barriers to effective teacher training, issues with internet connectivity, negative attitudes towards technology adoption, challenges in managing technology resources, and perspectives on the perceived benefits of new technologies. These findings shed light on the complexities involved in leveraging technology for enhancing teaching and learning outcomes. The discussion highlights strategies and recommendations derived from the qualitative data to

address these challenges effectively. By understanding the nuanced perspectives and experiences of stakeholders, educational institutions can tailor interventions to promote a supportive and technology-driven learning environment, thereby preparing students for success in the digital age.

Technology Tools

Findings:

Insufficient Number of Computers: Respondents highlighted that not all students have access to personal computers, and there is a shortage of computers available in educational institutions.

Cost and Availability: Technology remains expensive, making it inaccessible for many students. Limited availability of facilities further complicates technology integration in learning.

Discussion:

The findings underscore the economic barriers that hinder equitable access to technology in educational settings

Policymakers should prioritize funding for computer labs and explore strategies such as subsidies or partnerships to mitigate cost barriers.

Addressing infrastructure gaps is crucial for enhancing the integration of technology into educational practices.

Teachers Training

Findings

Lack of In-Service Training: Many teachers lack the skills needed to successfully incorporate technology into their lesson plans..

Impact on Teaching Quality: Insufficient training hampers educators' ability to utilize technology effectively, impacting teaching quality and student engagement.

Discussion:

Continuous professional development programs are essential to enhance educators' digital literacy skills and confidence in using technology.

Institutions should invest in comprehensive training initiatives tailored to the specific needs of educators in English language teaching.

Collaborative efforts between educational institutions and training providers can support ongoing skill development and knowledge enhancement.

Internet Connection

Findings:

Wi-Fi Reliability: Issues such as Wi-Fi disconnections and slow internet speed pose significant challenges during instructional delivery.

Student Impact: Unreliable internet connectivity affects student concentration and access to online resources, impacting the effectiveness of technology use in classrooms.

Discussion:

Ensuring robust internet infrastructure is critical for supporting uninterrupted technology-enhanced learning experiences.

Strategies should include investing in reliable network systems, exploring alternative connectivity solutions, and improving technical support services.

Addressing internet connectivity challenges is vital for fostering a conducive learning environment and maximizing the benefits of digital tools in education.

Negative Attitude

Findings:

Resistance to Technology: Both teachers and students exhibit negative attitudes towards technology adoption, citing factors such as perceived complexity and discomfort with change.

Psychological Barriers: Incompetence in technology and a lack of confidence in using digital tools contribute to resistance towards integrating technology into English language classrooms.

Discussion:

Dispelling myths and showcasing the usefulness of technology in the classroom are essential to fostering a good attitude towards it.

Educational strategies should focus on building confidence through hands-on training and showcasing successful case studies.

Encouraging a cultural shift towards embracing technology as a facilitator of learning can enhance acceptance and utilization among stakeholders.

Technology Resources

Findings:

Infrastructure Challenges: Problems such as power outages and malfunctioning projectors hinder the effective use of technology during instructional sessions.

Resource Limitations: Limited availability of projectors and technical support further complicates the integration of multimedia resources in teaching.

Discussion:

Prioritizing maintenance schedules and upgrades is essential to ensure reliable operation of technological resources.

Institutions should develop contingency plans and allocate sufficient resources for timely technical support and equipment repair.

Enhancing resource management practices can optimize the utilization of available technology resources and improve learning outcomes.

Valuing New Technology

Findings:

Perceived Learning Burden: Some students express reluctance towards learning new technologies, citing concerns about time investment and unfamiliarity.

Educational Benefits: Teachers stress how important it is to use technology in an efficient manner to improve student engagement and foster innovative learning opportunities.

Discussion:

Teaching pupils the advantages of technology can reduce opposition and encourage an innovative learning environment.

Incorporating digital technologies into instructional activities and modelling successful technology use are important roles played by teachers.

Implementing student-centered learning approaches that leverage technology can promote active participation and personalized learning experiences.

The thematic analysis highlights several challenges and opportunities related to technology integration in English language classrooms at the undergraduate level. Addressing these challenges requires a multi-faceted approach that encompasses infrastructure improvements, professional development, cultural change, and strategic resource management.

By implementing targeted interventions and fostering a supportive environment for technology-enhanced learning, educational institutions can optimize the educational experience and prepare students for a digitally-driven future.

Conclusion

In conclusion, the comprehensive analysis of integrating technology in English language classrooms at SALU and MUET illuminates both challenges and opportunities crucial for advancing educational practices in the digital age. This study has shown important challenges that must be overcome to maximise technological integration, offering detailed insights into the intricacies and dynamics at work within these academic institutions. The identified challenges underscore the need for strategic interventions. Firstly, addressing the competence gap in technology use among faculty and students is essential. The full ability of technology to improve student learning outcomes and teacher quality is impeded by this gap. Secondly, improving access to high-quality software and tools is crucial for enabling innovative instructional practices and expanding digital learning opportunities. Overcoming negative attitudes towards technology, which are prevalent among faculty and students due to concerns about complexity and disruption of traditional methods, is another critical step towards fostering a supportive environment for technology adoption. Infrastructure challenges such as unreliable internet connectivity and inadequate technical support further complicate effective technology integration. These issues must be prioritized to ensure seamless and uninterrupted technology-enhanced learning experiences for all stakeholders. To address these challenges, several strategic recommendations have been proposed based on the study's findings. Promoting innovative use of technology and incentivizing creative integration into teaching practices can enhance engagement and collaborative learning. Integrating cognitive learning methods through digital platforms empowers students to create and explore, preparing them for future challenges in a digitally driven world. Enhancing digital skills relevant to employment and revising curricula to integrate new technologies align educational objectives with industry demands, ensuring students are well-prepared for their careers.

Furthermore, comprehensive training and support programs for educators are essential to enhance pedagogical competencies and digital literacy. Continuous professional development ensures that educators are equipped to effectively utilize technology and adapt their teaching methods to meet evolving educational needs. Increasing the accessibility of digital tools and infrastructure—like dependable internet access and sufficient computer facilities—is essential to establishing an inclusive classroom where all students have equal access to learning materials. By adopting the Technology Acceptance Model (TAM) framework in conjunction with these suggestions, the various factors that impact educators' choices to implement technology are brought to light. Removing obstacles from the outside, improving perceived utility and use, encouraging positive attitudes, and considering social

and cognitive factors are critical components of promoting effective technology integration in educational settings. By integrating these strategies and frameworks, educators and policymakers can navigate the complexities of technology integration more effectively, ultimately aiming to enhance educational outcomes in English language education in Sindh, Pakistan.

Recommendations

Based on the findings and discussions, the following recommendations are proposed to address the identified challenges and foster effective technology integration in English language classrooms:

Investment in Infrastructure: Policymakers should prioritize funding for computer labs, reliable internet infrastructure, and technical support services in educational institutions.

Professional Development: Institutions should implement continuous professional development programs to enhance educators' digital literacy skills and confidence in using technology effectively.

Promotion of Positive Attitudes: Educational initiatives should focus on promoting a positive attitude towards technology adoption through awareness campaigns, hands-on training, and showcasing successful implementations.

Resource Management: Institutions need to develop comprehensive resource management strategies to ensure the reliable operation and optimal utilization of technology resources.

Student-Centered Learning: Educators should adopt student-centered learning approaches that leverage technology to promote active participation and personalized learning experiences.

By implementing these recommendations, educational institutions can overcome existing barriers, enhance technology integration in English language teaching, and ultimately improve learning outcomes for undergraduate students. Addressing these challenges will pave the way for a more inclusive and effective educational environment where technology serves as a catalyst for innovative teaching and learning practices.

Future Research Directions

Future studies should take into account the following in order to further develop knowledge and practice in technology integration within educational contexts:

Longitudinal Studies: carrying out longitudinal research to evaluate how adopted tactics affect academic results, student involvement, and the efficacy of instruction over the long run.

Comparative Analyses: Conducting comparative analyses in a variety of educational contexts to find best practices that apply to all situations and customise responses to meet the demands of particular institutions.

Emerging Technologies: Examining how cutting-edge tools like augmented reality and artificial intelligence might improve teaching and learning processes while encouraging creative thinking in language acquisition.

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