

## Technological Transformation in ESL Engineering Education: Exploring the Influence of Mobile Assisted Language Learning on Writing Skills Development

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### Abstract

This research investigates the transformative impact of digital tools, specifically Mobile Assisted Language Learning (MALL), smartphones, web applications, and E-Learning Management Systems (E-LMS), on writing skills, student engagement, and collaborative learning in ESL engineering education. The study uncovers a dynamic language learning environment where students use diverse digital platforms to navigate between formal and informal language. MALL emerges as a medium, offering real-time error correction and enhancing student engagement. Smartphone integration extends learning beyond traditional boundaries, fostering positive language education spaces. A comparison between traditional and digital writing highlights the role of technology in simplifying the writing process. E-LMS, exemplified by Abhyas, encourages collaborative learning, signalling a shift toward interactive and community-driven education. As ESL engineering education advances, this research advocates for integrating these digital tools as essential components. The findings suggest a transition toward student-centric and participatory learning paradigms in digital education. This study contributes valuable insights to the evolving field of ESL engineering education, offering suggestions for educators to harness the full potential of digital tools in shaping effective language learning environments.

**Keywords:** MALL, Digital Writing, E-Learning, Writing Skills, Collaborative Learning, ESL

## **Background to the study**

In the contemporary educational domain, technology plays a pivotal role, particularly in the realm of language acquisition in ESL engineering contexts. This study explores the transformative impact of technology on language education, evolving into an integral component of engineering curricula. While using computers or laptops for language practice posed initial challenges, the emergence of Computer Assisted Language Learning (CALL) marked a significant trend in engineering colleges, providing support for evaluating language learners' performance. The advent of smart phones ushered in a new era, bringing forth user-friendly applications that cater to the unique needs of language learners. Mobile Assisted Language Learning (MALL) has emerged as a sought-after medium due to its inherent advantages in comfort, accessibility, and cost-effectiveness. Stemming from the broader framework of Technology Assisted Language Learning (TALL) and further shaping the educational field through CALL, MALL has become a day-to-day, portable, comfortable, and highly productive medium for language acquisition, meeting learners' expectations in terms of possibilities, practice, and outcome-based opportunities.

This research primarily aims to investigate the efficacy of MALL as a mediation medium for developing writing skills within ESL engineering education. Data was collected through real-time conversations using a combination of social media web applications - WhatsApp and E-Learning Management Systems (E-LMS) platforms such as ABHYAS and Quizizz. The results affirm MALL's relevance as the optimal medium for teaching and enhancing writing skills. The study sheds light on the multifaceted advantages of MALL, emphasizing its role in enhancing language learning experiences within the engineering domain. This research adds valuable perspectives to the ongoing discourse about integrating technology into language education by offering a detailed comprehension of MALL's influence on writing skills.

## **Mobile Assisted Language Learning (MALL)**

Mobile Assisted Language Learning (MALL) represents a contemporary evolution within the broader realm of Computer Assisted Language Learning (CALL), presenting a modern approach that holds particular significance for language learners. The emergence of MALL has been recognized as a significant advancement in language education, with its roots traced back to the paradigm of CALL. Sharples Mn (2000) foresaw the growing influence of mobile learning, predicting its classification as a form of e-learning. This foresight emphasizes the transformative possibilities that mobile technology holds for engineering education. In the modern era, technology is central to

shaping educational methodologies. The widespread use of mobile devices has caused a notable increase in mobile teaching and learning, signifying a fundamental change in how education is delivered and received. The advent of the mobile phone, an essential tool in today's society, has been crucial in bringing about significant changes in the educational field. Miangh and Nezarat (2012p. 309) define MALL as utilizing mobile technology for language learning. They emphasize the liberating nature of MALL, highlighting that learners are no longer bound to traditional classrooms or fixed computers to access learning materials.

Understanding the specific needs and challenges of ESL engineering students is crucial in contextualizing the exploration of MALL within language education. ESL engineering students often face the dual challenge of mastering technical content while navigating language proficiency requirements. The language demands within engineering courses are unique, involving specialized terminology and precise communication skills. Hence, integrating innovative approaches like MALL becomes particularly important to address the linguistic requirements of the students. Tailoring language learning tools to align with the specific academic and professional communication needs of ESL engineering students can enhance both their language proficiency and technical competence, contributing to their overall success in academic and professional spheres.

Moreover, the globalized nature of engineering education necessitates effective language communication skills for ESL students. As engineering professions often involve collaboration on international projects and communication with diverse teams, ESL engineering students must possess proficiency in English language skills to articulate complex technical ideas. This study seeks to bridge the gap between language learning and engineering education, offering insights into how MALL can serve as a valuable mediation medium for ESL engineering students, aiding them in mastering both the linguistic and technical aspects crucial for success in their academic and future professional endeavours.

### **Review of literature**

The literature review discusses various studies to highlight the contributions of MALL to writing skills development and to understand its comparative effectiveness against traditional methods.

### **Impact of Mobile Assisted Language Learning (MALL) on Writing Skills**

Mobile Assisted Language Learning (MALL) emerged as a dynamic and influential pedagogical tool in language education, particularly within ESL engineering contexts. As educators seek innovative approaches to enhance writing skills among ESL engineering students, the integration of mobile technology becomes an important area of exploration. MALL has been recognized for its potential to contribute

significantly to improving writing skills in language learners, including ESL engineering students. In their study, Smith and Chen (2018) investigated the impact of MALL on writing proficiency, noting a positive correlation between MALL usage and enhanced writing skills among ESL students. The interactive nature of MALL facilitates continuous language practice, offering learners opportunities for real-world application of writing skills (Smith & Chen, 2018, p. 234). The impact of Mobile Assisted Language Learning (MALL) on writing skills is a subject of increasing interest, particularly in the context of ESL engineering education. Recognized as a dynamic and influential pedagogical tool, MALL offers a widerange of possibilities for educators to address the specific challenges ESL engineering students face in developing proficient writing abilities. In a study conducted by Smith and Chen (2018), the researchers sought to unravel the intricate relationship between MALL usage and writing proficiency, specifically among ESL students. Their findings suggest a positive correlation, highlighting the potential of MALL in enhancing the writing skills of language learners. One notable aspect emphasized by the study was the interactive nature of MALL, enabling continuous language practice. This feature is particularly advantageous for ESL engineering students who often grapple with the need for real-world application of their writing skills (Smith & Chen, 2018, p. 234).

The interactive nature of MALL allows students to engage with language learning materials beyond the confines of the traditional classroom setting. This flexibility is especially beneficial for ESL engineering students with demanding academic schedules. MALL provides them with the convenience of accessing language practice tools at their own pace and in varied contexts, aligning with the diverse demands of their engineering coursework. Furthermore, the real-world application of writing skills through MALL is a key factor in its effectiveness. ESL engineering students not only need to master the intricacies of English language writing but also must be adept at applying these skills to technical and professional contexts. MALL facilitates this transition by offering learners opportunities for practical and meaningful language use, bridging the gap between academic writing exercises and the demands of engineering communication. While traditional methods have their merits, the dynamic and adaptive features of MALL provide a more tailored approach to addressing the specific needs of ESL engineering students. Through immediate feedback, personalized exercises, and engaging content, MALL creates an environment that nurtures continuous improvement in writing skills.

### **Smartphones and Student Engagement**

Integrating smartphones into language education has brought about a paradigm shift in students' engagement and learning motivation. Johnson et al. (2019) conducted a comprehensive study exploring the impact of smartphones on student engagement, emphasizing the personalized and multifaceted nature of these devices. The study revealed that students using mobile technology, especially smartphones, demonstrated

higher levels of engagement and motivation in language learning activities (Johnson et al., 2019, p. 145). Mobile technology, particularly smartphones, has revolutionized various aspects of our lives, including education. Integrating smartphones into language education has brought about a paradigm shift in students' engagement and learning motivation.

Additionally, smartphones are widely available, enabling students to access language learning resources and practice activities anytime, anywhere. E-Learning Management Systems (E-LMS) platforms provide students with a structured framework for language learning, offering access to learning materials, interactive exercises, and virtual classrooms (He, 2016, p. 340). These platforms contribute to student engagement by providing systematic instruction, practice opportunities, and personalized feedback. E-Learning Management Systems (E-LMS) platforms also support student engagement by fostering a sense of community and connection. Students can interact with their teachers and peers through discussion forums, chat features, and virtual classrooms. This interaction enhances engagement, as students feel connected to a larger learning community and can receive support from their peers and instructors (Smith & Strong, 2016, p. 862).

Research has shown that collaborative learning through social media enhances students' engagement and motivation. It promotes active participation, peer feedback, and authentic language use, which are crucial for language skill development (Lai & Li, 2019, p. 114). In addition to individual engagement, smartphones facilitate collaborative learning and student interaction. Social media platforms, such as WhatsApp, Twitter, and Facebook, provide opportunities for students to connect and communicate with each other outside of the classroom. These platforms offer a space for peer-to-peer interactions, collaborative projects, and language practice in authentic contexts (Lai & Li, 2019, p. 113). The interactive and social nature of social media platforms fosters a sense of community among students, enhancing their engagement in language learning activities. Another significant impact of smartphones on student engagement is the provision of immediate feedback. Digital writing tools available on smartphones, such as grammar and spell-checking features, help students improve their language accuracy and fluency (Bullen et al., 2011, p. 8). Immediate feedback gives students a sense of progress and encourages them to continue practising their writing skills.

Furthermore, smartphones offer access to a wide range of online resources, including language dictionaries, grammar guides, and online language courses. This availability of resources enhances students' ability to self-correct and self-improve their language skills (Bullen et al., 2011, p. 10). Combining immediate feedback and readily available resources contributes to student engagement and motivation in language learning.

## Web Applications and Social Media

The use of web applications like Vocab24, quizzes, and social media platforms such as WhatsApp, Twitter, and Facebook has become integral to language learning in ESL engineering education. According to a study by Li and Wang (2020), these applications offer a multifaceted approach to language acquisition, incorporating vocabulary building through apps like Vocab24 and fostering communication skills through social media platforms. Such varied tools contribute to a comprehensive language learning experience, positively influencing written communication skills (Li & Wang, 2020, p. 78). Investigating the differences in performance between traditional writing and digital writing in the context of mobile technology is crucial. A comparative analysis by Garcia and Kim (2017) explored how digital writing tools impact ESL learners. Their findings suggested that digital writing enhances the writing process and promotes collaborative learning, allowing students to receive instant feedback and engage in peer review (Garcia & Kim, 2017, p. 112).

The implementation of E-Learning Management Systems (E-LMS) like Abhyas has gained attention in ESL engineering education. E-LMS platforms offer a structured and accessible environment for students to engage with course materials, including writing assignments. A study by Sharma and Patel (2019) investigated the influence of E-LMS on writing skills development, revealing a positive correlation between E-LMS usage and improved writing proficiency among ESL engineering students (Sharma & Patel, 2019, p. 205). Mobile technology, smartphones, web applications, and E-LMS collectively contribute to a holistic language learning experience, offering personalized, engaging, and effective avenues for writing skills development. Understanding these dynamics is crucial for educators and policymakers seeking to optimize language education for ESL engineering students in the digital age.

## Mobile Assisted Language Learning (MALL) in ESL Teaching-Learning Contexts

Mobile Assisted Language Learning (MALL) has gained significant attention in recent years for its potential to enhance language skills, specifically in the context of ESL engineering students. This approach utilizes mobile technology, particularly smartphones, to facilitate language learning and improve writing skills. By integrating mobile technology into language education, MALL has the potential to offer a range of benefits that traditional methods may not provide. One significant impact of incorporating mobile technology, especially smartphones, is the improvement in students' engagement and learning motivation. Studies have shown that students often find mobile devices more engaging and enjoyable as learning tools compared to traditional methods (Chinnery, 2006). The portability and personalization features of smartphones allow students to access language learning resources at any time and from any location, increasing their motivation to engage in language learning activities (Levy & Stockwell, 2006). The interactive and multimedia capabilities of smartphones also

create a learning environment that enhances students' interest and motivation (Godwin-Jones, 2011). Web applications and social media platforms have also proven effective in enhancing language learning and written communication skills among ESL engineering students. Platforms such as vocab24, Quizzes, WhatsApp, Twitter, and Facebook offer opportunities for collaborative learning, peer feedback, and authentic language use (Lai & Li, 2019). These platforms enable students to practice language skills in real-life situations and encourage active participation in writing activities. The use of mobile technology in language learning has gained attention in recent years due to its potential to enhance language skills. Mobile-Assisted Language Learning (MALL) refers to integrating mobile devices, particularly smartphones, into language education to facilitate learning and improve writing skills. Many studies have discussed the advantages of using mobile technology in language learning. One significant impact of incorporating mobile devices, especially smartphones, is the improvement in students' engagement and learning motivation. Chinnery (2006) found that students often find mobile devices more engaging and enjoyable as learning tools than traditional methods. Students can access various language learning applications, multimedia content, and interactive exercises on their smartphones, making learning more interactive and engaging. The ability to incorporate audio, video, and interactive elements into language learning materials provides learners with diverse and immersive learning experiences.

While MALL offers numerous benefits, it also faces some challenges and limitations. One of the main challenges is the lack of technological infrastructure and resources in certain educational settings, particularly in developing countries. Not all students may have access to smartphones or reliable internet connections, limiting their ability to engage with MALL activities fully. Moreover, the effectiveness of MALL heavily relies on the quality of the language learning applications and resources available. Not all applications are well-designed or provide appropriate language-learning content. It is essential for educators and developers to critically evaluate the effectiveness and suitability of mobile applications before integrating them into language learning.

Furthermore, the potential distractions and misuse of mobile devices pose challenges in maintaining students' focus and engagement. Students may deviate from language learning activities and instead engage in non-educational use of their smartphones. Educators must establish clear guidelines and strategies to minimize distractions and maximize the educational benefits of mobile devices.

### **Traditional Writing and Digital Writing**

Several differences can be observed when comparing traditional writing to digital writing using mobile technology. Digital writing provides students with immediate feedback, grammar and spell-checking features, and access to a wide range of online resources to enhance language accuracy and fluency (Bullen, Morgan, & Qayyum, 2011).

It also allows for revision and editing in real-time, which fosters self-reflection and improvement in writing skills (Kukulka-Hulme & Shield, 2008). The implementation of an E-Learning Management System (E-LMS) like Abhyas can have a significant influence on students' writing skills development in an ESL engineering education setting. E-LMS platforms provide students with a structured and organized framework for language learning, offering access to learning materials, interactive exercises, and virtual classrooms (He, 2016). This enhances students' writing skills by providing systematic instruction, practice opportunities, and personalized feedback (Smith & Strong, 2016). Mobile Assisted Language Learning (MALL) has the potential to contribute to the improvement of writing skills among ESL engineering students when compared to traditional methods. Integrating mobile technology, specifically smartphones, enhances students' engagement and learning motivation. The use of web applications, social media platforms, and E-LMS systems also offers students opportunities for collaborative learning, authentic language use, and systematic instruction. Therefore, mobile technology and its various applications have the potential to revolutionize language learning and contribute to the development of students' writing skills in ESL engineering education.

### Research Questions

The current study addresses the following research questions.

- How does Mobile-Assisted Language Learning (MALL) impact writing skills development among ESL engineering students compared to traditional methods?
- How does smartphone integration influence students' engagement and learning motivation in language education?
- How do ESL engineering students perceive and actively engage with web applications, such as WhatsApp, ABHYAS, and Quizzes, in language learning?
- What advantages and challenges are associated with digital writing facilitated by mobile technology?
- To what extent does the implementation of an E-Learning Management System (E-LMS), like Abhyas, influence collaborative learning experiences and writing skills development among ESL engineering students?

### Methodology

The study employed a mixed-methods research design to explore the impact of digital tools, such as Mobile Assisted Language Learning (MALL), smartphones, web applications, and E-Learning Management Systems (E-LMS) on ESL engineering education. A qualitative analysis was conducted to understand the influence of MALL on writing skills, student engagement, and collaborative learning experiences. This



involved an examination of digital communication tools, code-switching patterns, and the informal nature of interactions. Additionally, the study focused on the integration of smartphones and their role in fostering positive and interactive communication styles among ESL engineering students. A qualitative comparison between traditional and digital writing was conducted, highlighting the advantages and challenges associated with mobile technology.

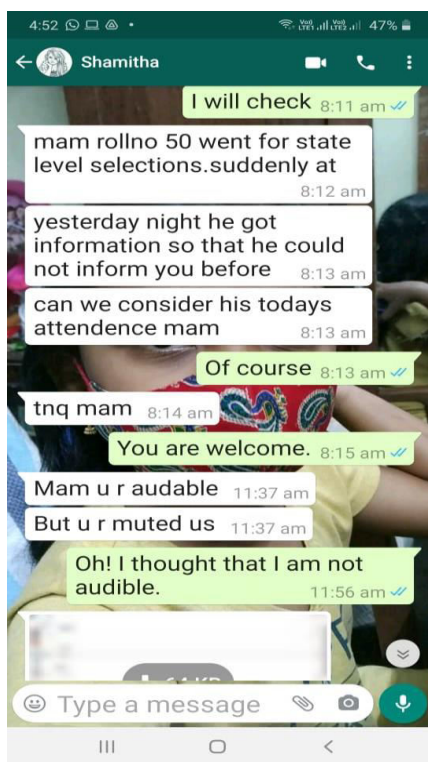
Furthermore, the study explored the impact of E-LMS, with specific focus on Abhyas, in managing assignments and providing a collaborative space for students. Quantitative data complemented the qualitative findings through the usage of analytics to provide a holistic understanding of the dynamic interactions between students and these digital tools. The research design aimed at capturing the multifaceted aspects of language learning in ESL engineering education.

### **Data Analysis**

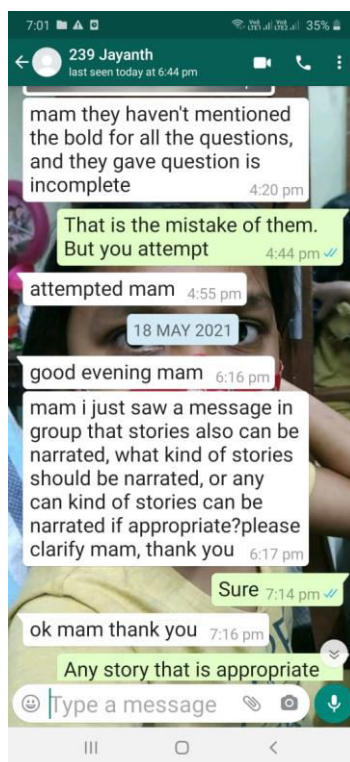
The data analysis process involved a meticulous examination of qualitative and quantitative data to derive meaningful insights into the impact of digital tools on ESL engineering education. Qualitatively, the study explored patterns of WhatsApp chats and Quizizz data within digital communication tools, revealing a blend of formal and informal language, code-switching phenomena, and the use of abbreviations. The qualitative analysis extended to smartphone integration, emphasizing the friendly and interactive communication styles facilitated by these devices. A comparative analysis between traditional and digital writing uncovered advantages, such as automatic error correction, and challenges related to the informality and rapid nature of digital communication. The data also presents the role of E-Learning Management Systems (E-LMS), particularly Abhyas, in managing assignments and fostering collaborative learning environments.

### **Social Media Applications**

The following WhatsApp conversations are between a teacher and a student.



Figure(i)

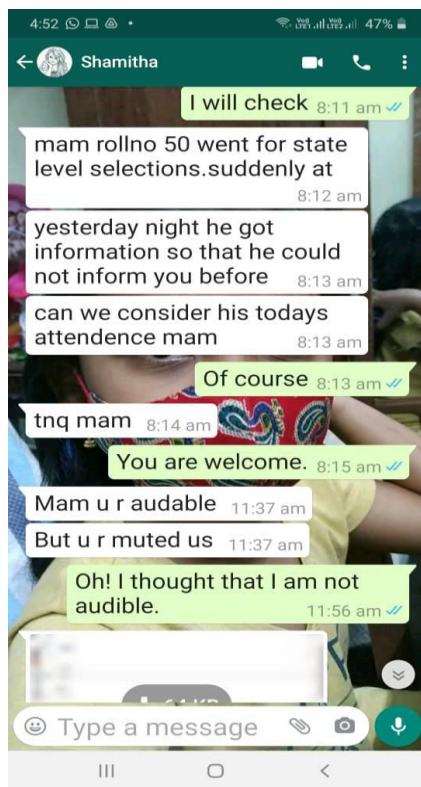


Figure(ii)

In Figure (i), The conversation blends English and abbreviations like "tnq" for "thank you," reflecting code-switching. This is common in informal digital communication. The use of terms like "mam" instead of "ma'am" reflects informal or colloquial language. It suggests a familiarity or informal rapport between the student and the teacher. The pragmatic aspect is evident in the expressions of politeness, such as "tnq mam" and "You are welcome." These expressions contribute to the politeness strategies employed in the conversation. The back-and-forth exchange between the student and the teacher follows the principles of turn-taking in conversation. Each participant takes turns to speak or respond, maintaining conversational coherence. The use of timestamps ("8:11 am," "8:12 am") and the acknowledgement of audibility issues ("Mam u r audable") are specific to digital communication. These features contribute to the context of the online conversation. The informal and rapid nature of the communication is reflected in the orthography, with shortened words like "u" for "you" and the omission of certain letters for brevity.

In Figure (ii),The conversation unfolds chronologically with a respectful tone, marked by the use of "mam" for formal address. Messages are delivered concisely, maintaining a clear and direct communication style. The dialogue revolves around issues such as incomplete questions, errors, and the need for clarification within a group dynamic. Consistency is maintained in language usage and communication style throughout the conversation. The user employs courteous language, as evidenced by the consistent use

of "mam" and expressions of gratitude. The user raises concerns about incomplete questions and errors made by others within the group. There is an active effort to seek clarity on the acceptable content within the group context. The user actively participates in the discussion, demonstrating a keen interest in understanding group guidelines. The language employed reflects a respectful and straightforward communication style. The user engages thoughtfully with the content, expressing concerns and seeking clarification.



Figure(iii)



Figure(iv)

In the above screenshots, the messages from the students are filled with a few errors. The student did not stop but continued the conversation. The mobile technology even allows the errors to be corrected automatically. The same case applies to Twitter, Facebook, and Instagram.

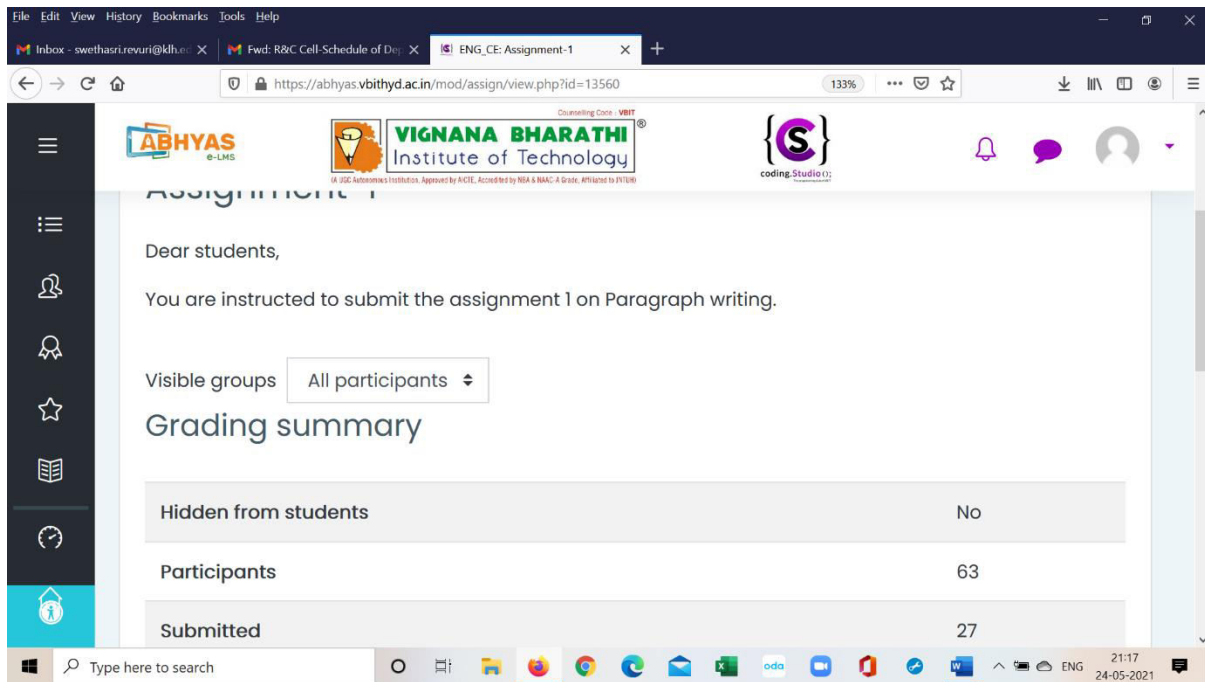
In Figure (iii), the messages include time stamps that indicate a real-time or near-real-time conversation. The communication is relatively informal, as evident from the use of abbreviations like "tnq" for "thank you." Politeness is demonstrated through phrases like "tnq mam" (thank you, mam) and "You are welcome." The conversation involves information sharing about a student, Mythri Celine, who went for state-level selections. The discussion revolves around attendance and communication regarding an unexpected. There is a direct query about considering today's attendance for a student

who could not inform the teacher in advance. The response is prompt and affirmative. There is an acknowledgement of technical issues, specifically regarding audio. The teacher admits the misunderstanding and addresses the situation. The use of abbreviations like "tnq" and informal language, such as "ur" for "you're," adds an informal touch to the conversation. The teacher responds promptly to the queries and concerns raised by the students, maintaining an interactive and responsive communication style. The communication is clear and concise, with confirmations like "Of course" to affirm decisions or responses. The language used in the data indicates an informal and friendly communication style between a student and her teacher.

In Figure IV the conversation begins with a standard greeting, "How are you?" indicating a friendly and polite tone. "Hello ma'am" and expressions like "Hope that you have remembered me" suggests a courteous communication style. A repeated query about working with the Khelo team indicates a curiosity about the recipient's current professional involvement. The conversation involves exchanging information about the Khelo team, whether anyone is working with them, and the availability of internship opportunities. The message "Hope that you have remembered me" suggests a desire to confirm recognition and a hint at past interactions. The use of "Oh! Really!" and casual expressions like "If you are interested, I will ask for an internship" adds a conversational and informal touch. The inclusion of time references ("5:44 pm," "6:25 pm") provides a sense of the timeline of the conversation. There is an offer to inquire about an internship opportunity for the recipient, showing a willingness to help or assist. The communication is responsive, with quick replies to the queries and offers made during the conversation. The recipient acknowledges the information and intends to provide updates, as seen in "Okay, ma'am. Will let you know!" The informal language and time references contribute to a conversational and engaging communication style.

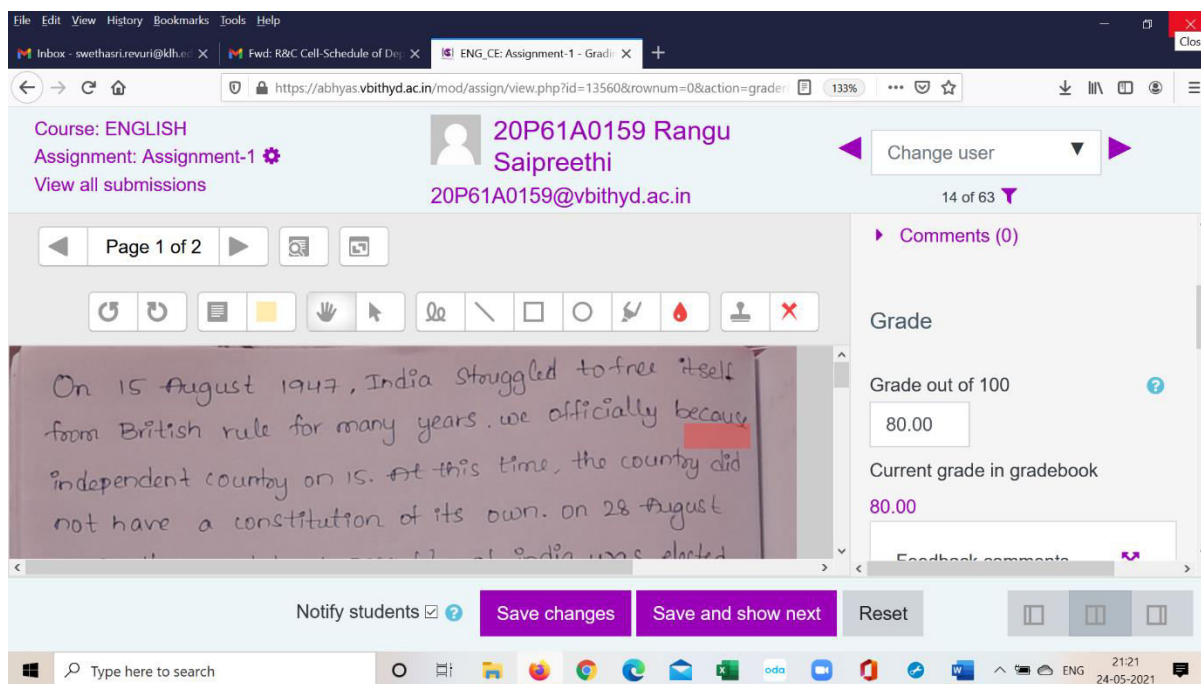
### **E-Learning Management Systems (E-LMS) platform: Abhyas**

Abhyas is an E-LMS used by the Vignana Bharath Institute of Technology. It allows the learners to upload the assignments and learning material. It can be accessed through mobile technology. Abhyas is the medium of writing skills for the students.



Figure(v)

In Figure (v), the communication is formal, as it is addressed to "Dear students" and comes from an educational institution. The use of headings like "ABHYAS" and "VIGNANA BHARATHI Institute of Technology" adds formality. The message provides clear instructions to students, indicating that they are instructed to submit Assignment 1 on Paragraph writing. The mention of "VIGNANA BHARATHI Institute of Technology" and terms like "Visible groups," "Grading summary," and "Hidden from students" reflect the institutional or educational context. The assignment is specified as "Paragraph writing," indicating a focus on this particular skill. The mention of "ABHYAS" suggests the potential use of an E-LMS for managing assignments and possibly enhancing the learning experience.

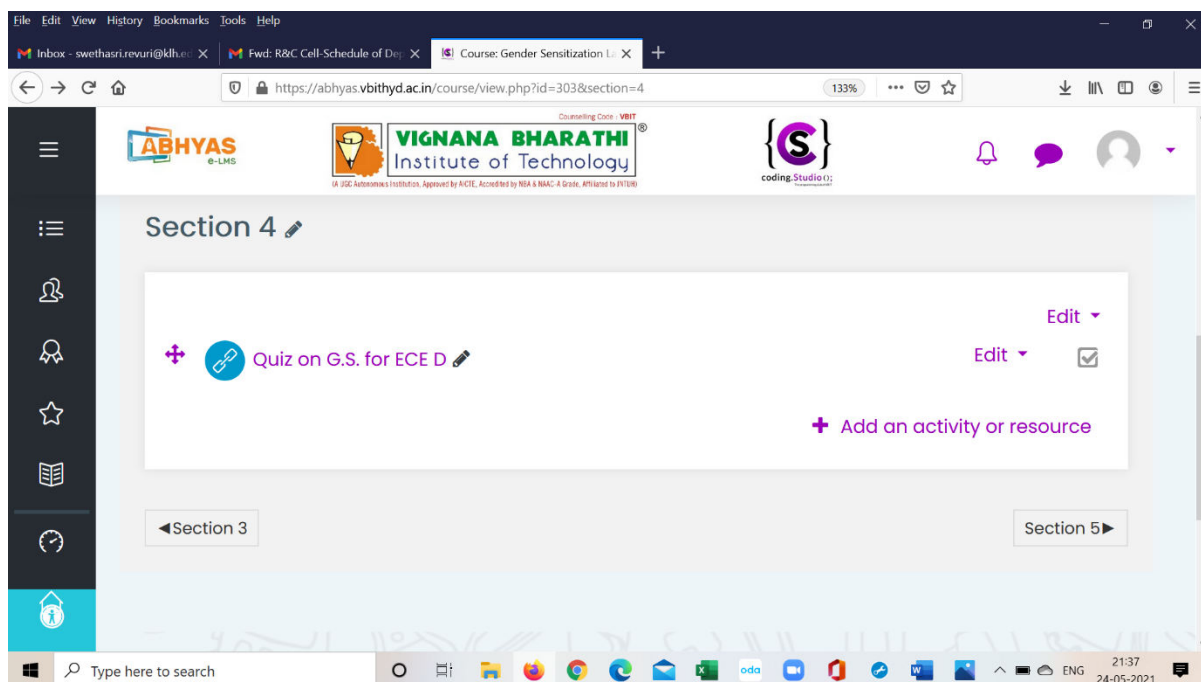


Figure(vi)

In the above figures (vi), the students submitted the assignment for grading. The faculty reviewed it, and the errors were highlighted. When the faculty gave the grade, the students would receive a notification.

The content appears to be an assignment for the English course, specifically labelled as "Assignment-1." The mention of "View all submissions" suggests the use of an E-LMS (like Abhyas) for managing and reviewing assignments. The student is identified by the name "Rangu" and the unique identifier "20P61A0159." This information could be essential for tracking individual student progress. The content of the assignment is related to India's struggle for independence, and it appears to be part of an English course within an ESL engineering education setting. The content contains language errors and typos, such as "rult" instead of "rule," "becous" instead of "because," and incomplete sentences like "on 15." This reflects the writing style and potential areas for improvement. The E-LMS could facilitate feedback mechanisms, allowing instructors to comment on specific language issues and guide students toward improvement. The data indicates the use of an E-LMS in an ESL engineering education setting for managing assignments.

The screenshot below is a quiz link related to multiple-choice questions posted in ABHYAS portal.

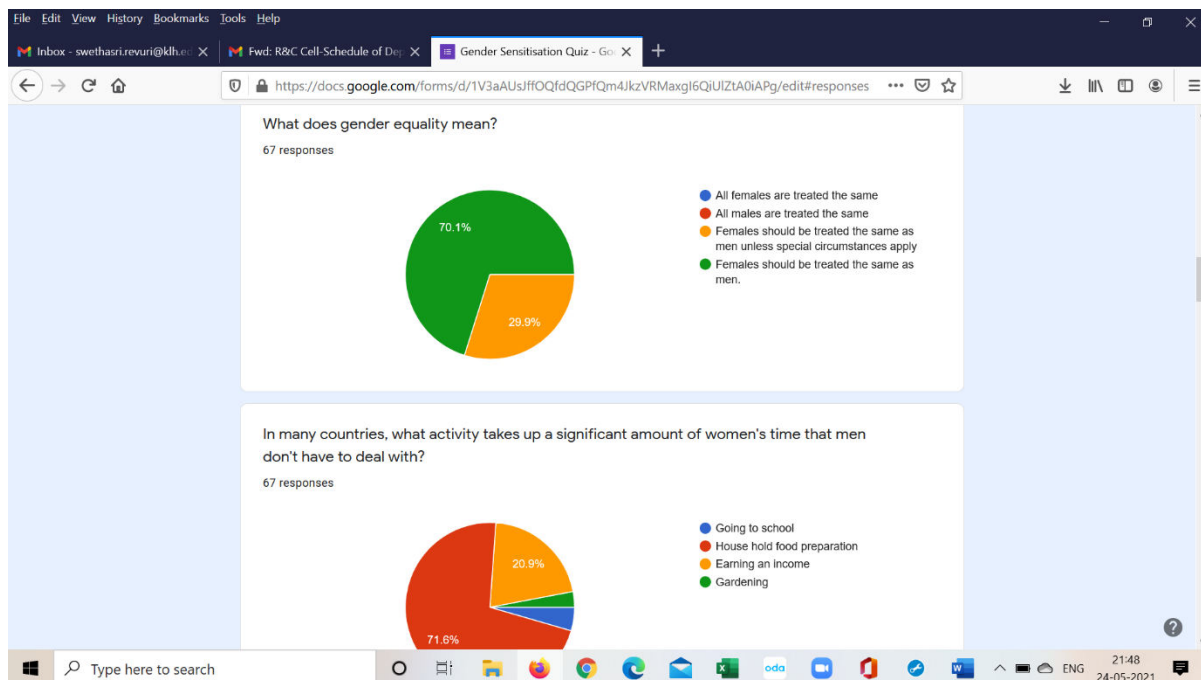


Figure(vii)

In Figure(vii). the mention of "Institute of Technology" indicates an educational institution or engineering college. The term "ABHYAS" suggests the use of an E-LMS within the educational setting. The instruction to "+ Add an activity or resource" indicates the interactive nature of the system, allowing users to include various elements in their coursework. The content refers to different sections, including "Section 5," and mentions the addition of an activity or resource, specifically a "Quiz on GS for ECE D" in "Section 3." The presence of "Edit" suggests ongoing customization or modification within the E-LMS platform, allowing users to make changes to their learning materials. Symbols like "+" and "☆" may indicate interactive features or special elements within the E-LMS, allowing users to add content or highlight specific activities.

The data in Figure (vii) does not directly address writing skills. However, the ability to add activities or resources, including quizzes, within the E-LMS suggests a broader educational context that could potentially contribute to writing skills development through written assignments, discussions, or feedback mechanisms. The collaborative nature of E-LMS platforms may foster communication and collaboration among ESL engineering students, providing opportunities for written interactions, discussions, and shared resources. While the provided content does not explicitly mention writing skills, the use of an E-LMS like "ABHYAS" in an ESL engineering education setting suggests a platform that could play a role in various aspects of students' learning, including written communication, collaboration and potentially writing skills development through assignments and interactions.

The screenshot presented below is statistical information about student performance in an online quiz administered on the mobile application Quizizz.



Figure(viii)

In Figure 7, the data provided on quiz on gender sensitization using pie charts indicates the relevance of web applications in online assessment activities. The quiz contains questions about gender equality and women's activities in different countries, with responses. The quiz includes options with varying degrees of agreement, allowing participants to express Percentage responses for each question are provided, offering insights into the distribution of opinions among the respondents. The quiz focuses on gender sensitization, indicating an effort to incorporate social issues and awareness within the educational setting. The number of responses (67) suggests student engagement with the online survey, indicating a willingness to participate in web-based activities. While the content is focused on gender sensitization, the

The data presented above indicates an engagement with an E-LMS platform (ABHYAS) and the use of web applications, specifically Google Forms, for educational quizzes. The content focuses on gender sensitization, but the use of such platforms suggests an opportunity for language learning and written communication in ESL engineering education.



## Findings of the study

The findings highlight the transformative impact of digital tools on writing skills development, student engagement, and collaborative learning experiences.

## Writing Skills Development

The study explores how MALL improves writing skills among ESL engineering students compared to traditional methods. Data analysis indicates a blend of formal and informal language, reflecting the phenomenon of code-switching commonly observed in digital communication. The use of abbreviations like "tnq" and "mam" suggests an informal rapport between students and teachers. The pragmatic aspect of politeness strategies, as seen in expressions like "tnq mam" and "You are welcome," is vital in fostering a positive and respectful tone. The turn-taking principles, punctuated by timestamps and acknowledgement of audibility issues, highlights the significance of the online context in shaping these interactions. The informal and rapid nature of communication, characterized by orthographic shortcuts, aligns with the informal atmosphere of digital conversations. The findings suggest that MALL, represented by the digital communication tools used, provides a dynamic environment for language learning. The ability to correct errors in real-time online conversation indicates the potential of mobile technology in facilitating immediate feedback, an essential element in writing skills development. Furthermore, the informal nature of digital communication enhances student engagement and participation, fostering a more interactive learning environment than traditional methods.

## Integration of Mobile Technology

The study focuses on the impact of smartphone integration on students' engagement and learning motivation in language education. The conversations reveal a friendly and courteous tone in digital interactions, emphasizing the potential influence of digital tools on creating positive and engaging learning environments. The data analysis indicates that the integration of smartphones contributes to a friendly and interactive communication style. The use of greetings, expressions like "Hope that you have remembered me," and inquiries about working with the Khelo team demonstrate the potential influence of smartphones in fostering communication beyond traditional academic discussions. The informal language and quick replies further highlight the ease and accessibility offered by mobile technology. The findings suggest that students actively engage with web applications, reflecting a multifaceted approach to language learning. The eclectic mix of WhatsApp, ABHYAS, and Quiziz suggests that students are not confined to traditional methods but are exploring varied digital platforms for language enrichment.

The study discusses observed differences in performance between traditional writing and digital writing when utilizing mobile technology in language education. The data provides insights into the advantages and challenges associated with digital writing. The findings highlight the advantages of digital writing facilitated by mobile technology. The ability to correct errors automatically, as evident in online conversations, highlights the efficiency and convenience offered by digital platforms. The integration of correction mechanisms enhances the writing process, allowing students to focus on content rather than mechanics. However, the data also suggests that the informality and fast nature of digital communication may lead to errors. Despite these challenges, the automatic correction features mitigate potential issues, emphasizing the adaptability and resilience of digital writing facilitated by mobile technology.

### **E-Learning Management System (E-LMS) for Collaborative Learning**

The study also explores the extent to which the implementation of an E-LMS, like Abhyas, influences students' writing skills development in an ESL engineering education setting. The analysis sheds light on the role of E-LMS in managing assignments and providing a platform for collaborative learning. The formal communication from the educational institution using the E-LMS, as seen in Figure (v), reveals the role of platform in managing assignments. The assignment submission process, including the review and grading phases, reflects the potential of E-LMS in providing a structured and organized environment for writing skills development. The data suggests that E-LMS platforms, like Abhyas, foster collaborative learning among ESL engineering students. The ability to upload assignments, receive feedback, and engage in discussions indicates a collaborative and interactive space for students to enhance their writing skills collectively. The findings of this study provide valuable insights into the impact of digital tools on ESL engineering education. Mobile technology, web applications, and E-LMS platforms collectively create engaging and interactive learning environments. The adaptability of digital communication tools, with the advantages they offer in terms of immediate feedback and collaborative learning, positions them as valuable assets in language learning and writing skills development. As technology continues to evolve, understanding and improving the potential of these digital tools become essential for educators and institutions aiming to provide dynamic and effective language education in ESL engineering contexts.

Abhyas, as an E-LMS, played a significant role in coordinating collaborative learning experience. The collaborative features of E-LMS platforms, including the ability to upload assignments, receive feedback, and engage in discussions, signify a shift towards collaborative and interactive learning. E-LMS platforms like Abhyas have the potential to develop a sense of community among ESL engineering students, providing them with a shared space for collective growth and skill development. As technology keeps

changing, educators must navigate the digital horizon with a keen understanding of the transformative potential of MALL, smartphones, web applications, and E-LMS platforms. Embracing these tools as supplements and integral components of the teaching-learning contexts will be crucial. The collaborative and interactive nature of digital tools allows educators to redefine pedagogical approaches, encouraging student-centric and participatory learning. The journey ahead involves continuous exploration, adaptation, and innovation to harness the full potential of digital tools in shaping the linguistic and academic development of ESL engineering education.

### **Role of MALL in Language Learning**

The study unravelled the potential of MALL in revolutionizing language learning experiences. The blend of formal and informal language, characterized by code-switching and the use of abbreviations, reflects the effectiveness of digital communication. The pragmatics of politeness strategies, turn-taking principles, and the rapid, informal nature of communication contribute to a dynamic environment conducive to language learning. The immediacy of error correction in real-time communication highlights the role of MALL in providing instantaneous feedback, an important feature in enhancing writing skills. Moreover, the informal atmosphere develops increased student engagement and participation, overcoming the constraints of traditional methods. MALL emerges not only as a tool for language acquisition but as a medium for interactive and collaborative learning experiences. The integration of smartphones positively influences student engagement and motivation in language education. The friendly and courteous tone observed in digital interactions reveals the potential of smartphones to create positive and engaging learning environments.

As demonstrated by expressions like "Hope that you have remembered me" and inquiries about working with external teams, smartphones extend the learning contexts beyond the classroom, promoting a holistic approach to language education. The findings suggest that smartphones serve as communication tools and facilitators of enriched and interconnected learning experiences. Students demonstrated a multifaceted approach to language learning through active engagement with web applications. The eclectic mix of platforms such as WhatsApp, ABHYAS, and Quizzes demonstrates a departure from traditional methods. The data indicates that students are not confined to conventional learning approaches but actively explore diverse digital platforms for language enrichment. A comparison between traditional and digital writing highlighted both the advantages and challenges associated with the integration of mobile technology. The automatic error correction feature emerged as an advantage, emphasizing the efficiency and convenience of digital platforms. The ability to focus on content rather than mechanics reveals the potential of technology in simplifying the writing process. However, the informality and speed of digital

communication may lead to errors. Despite these challenges, the automatic correction features reduce potential errors. Balancing the benefits and addressing challenges is crucial for a comprehensive approach to language education.

### Conclusion

This study emphasizes the impact of digital tools like Mobile Assisted Language Learning (MALL), smartphones, web applications, and E-Learning Management Systems (E-LMS) on writing skills, student engagement, and collaborative learning within ESL engineering education. The research reveals a shifting environment where students navigate between formal and informal language and use diverse digital platforms for language development. MALL emerges as an important medium, providing real-time error correction and enhancing student engagement in language learning. Smartphone integration expands learning environments, creating a positive environment for language education. The comparison between traditional and digital writing highlights the advantages of technology in simplifying the writing process. E-LMS encourages collaborative learning, marking a move towards interactive and community-driven education. As ESL engineering education progresses, integrating these digital tools as integral components in teaching-learning contexts can lead to productive outcomes. This study recommends that educators reevaluate teaching approaches, fostering student-centric and participatory learning in digital education.

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