Effects of ICT Integration on English Language Learning at the Secondary Level

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Abstract

The use of Information and Communication Technology (ICT) in education is receiving growing attention, especially for its ability to make language learning more effective and engaging. The purpose of this study was to explore how ICT effects the teaching of the English Language at the secondary level students. Employing an experimental research design, the study incorporated both pre-test and post-test measures across two groups to evaluate learning outcomes. The study was conducted among 60 ninth-grade students at a public secondary school in Bagmati Municipality, Sarlahi district. From this group, 30 students were chosen for in-depth interviews to gather qualitative insights into their learning experiences. The findings of the study indicated a significant difference in academic performance between the two groups. Specifically, students who were taught using ICT-based methods achieved notably higher results compared to those taught through traditional approaches. These findings highlight the effectiveness of integrating ICT to enhance English Language Learning (ELL) at the secondary school level.

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Introduction

Information and Communication Technology (ICT) is a broad and ever-evolving field that plays a vital role in contemporary society. At its core, ICT refers to all technologies used to handle telecommunication, broadcast media, intelligent building management systems, audio-visual processing and transmission systems, and network-based control and monitoring functions (UNESCO, 2009). It goes beyond traditional Information Technology (IT) by emphasizing the integration of various communication tools—such as computers, mobile devices, internet platforms, and multimedia applications—into cohesive systems that facilitate the processing, dissemination, and exchange of information across diverse contexts. In today's world, we are continually interacting with ICT by sending emails, screening videos, using smartphone apps, joining video conferences, accessing educational platforms, or engaging in virtual collaboration (ITU, 2020).

One of the transformative features of ICT is its capacity to integrate various communication technologies into a seamless interactive system. Umar and Hassan (2015) notes that such technological integration has played a role in creating a "global village," where information and ideas can cross geographic, national, and cultural boundaries almost instantly. This level of connectivity has transformed not only how we interact socially and professionally but also how we learn and teach.

ICT has significantly impacted education worldwide by changing how information is delivered and absorbed. It makes teaching and learning more dynamic and interactive. According to Kilag et al. (2023), the use of ICT in education makes learning more engaging and accessible, leading to better educational outcomes for students. Students are no longer limited to textbooks and classroom lectures; with ICT, they can access digital libraries, multimedia presentations, virtual laboratories, and online discussions, all of which enhance their learning experiences.

Despite global enthusiasm for incorporating ICT into classrooms, many developing countries, including Nepal, still face several barriers to its effective implementation. Infrastructure limitations, unreliable internet connectivity, and a lack of digital resources continue to hinder progress in this area (Bala et al., 2023). Beyond these technical obstacles, there lies another major challenge: the mindset of educators. Teachers' attitudes, confidence, and their belief in the usefulness of

ICT play a crucial role in determining whether these tools are actually used in the classroom. As Joshi et al. (2021) emphasize, secondary school teachers in Nepal need comprehensive ICT training programmes to overcome these personal and professional hurdles.

The advantages of integrating ICT into education are numerous and well-documented. As Saradha (2023) points out, ICT enables greater access to educational resources and fosters collaboration among students. It also supports differentiated instruction, allowing teachers to adapt lessons to individual learning styles and needs. ICT tools such as multimedia content, educational software, and online quizzes help make learning more personalized and effective. Fontanos et al. (2020) highlight that ICT not only promotes student-centered learning but also encourages critical thinking, problem-solving, and creativity.

Furthermore, a research has shown that using ICT in the classroom increases student engagement, enthusiasm, and academic performance (Alisoy, 2023). Digital tools can make learning feel more like a discovery process rather than a passive reception of facts. For example, interactive whiteboards, educational games, and simulation apps can transform even the most complex subjects into engaging and understandable content. This shift is significant in a time when digital literacy is as essential as reading and writing.

One of the areas where ICT has shown particular promise is in the teaching and learning of English as a foreign language. With globalization, English proficiency has become a critical skill in both academic and professional settings. ICT tools such as online dictionaries, grammar checkers, language-learning apps, and multimedia content help create an interactive and immersive environment for students to practice their English skills. Altun (2015) asserts that technology enhances language learning by making lessons more appealing and helping students stay motivated. These tools can also improve pronunciation, vocabulary, listening skills, and even cultural understanding through exposure to native speakers and real-world contexts.

According to Qin and Shuo (2011), ICT introduces a variety of teaching strategies and content formats that enrich both the language input and the learning environment. Teachers can supplement traditional classroom activities with videos, songs, podcasts, and mobile apps that adapt to learners' pace and preferences. The result is a more flexible and engaging English learning experience that fosters not only language acquisition but also a deeper connection with the subject matter.

The COVID-19 pandemic served as a major turning point in how education systems around the world including Nepal approached ICT. As schools shut down and in-person classes became impossible, educators were forced to shift to remote and online teaching. While the transition was challenging, it accelerated the adoption of digital tools and showcased the potential of ICT in maintaining educational continuity. Dawadi et al. (2020) observed that although the sudden shift exposed various systemic weaknesses, it also brought lasting improvements in teachers' digital teaching practices. For many educators and students, this experience marked the beginning of a deeper integration of technology into everyday learning.

In today's classrooms, ICT opens up endless possibilities. Students can attend virtual classes, participate in group projects via shared platforms, access global databases, and even receive tutoring from AI-powered applications (UNESCO, 2022). These resources empower learners to take charge of their education—reviewing lessons at their own pace, exploring topics of personal interest, and preparing for a world that increasingly values digital competence (Ally, 2019).

ICT has fundamentally reshaped the landscape of modern education. It has opened doors to more interactive, inclusive, and effective teaching and learning processes. While challenges remain particularly in developing countries, ongoing efforts in infrastructure development, teacher training, and policy support can help bridge the digital divide. With the right strategies in place, ICT has the potential to transform classrooms into vibrant learning environments where all students can thrive, regardless of their background or learning style. As we continue to navigate the digital age, embracing ICT in education is not just a choice, it is a necessity.

Objectives

The main purpose of this study was to find out how using ICT can help in teaching and learning the English Language. It also aimed to understand how students at the secondary level feel about learning English with the help of ICT tools.

Review of Related Literatures

Integration of ICT into education has created a significant opportunity for reshaping contemporary pedagogical practices, particularly in English language classrooms. It has offered and enabled the teachers to adopt the learner-centered pedagogies, promote the individualized learning process and provide students access

to diverse, high-quality and authentic resources. However, it is traced that a large number of teachers, especially in developing contexts, lack adequate professional training in the use of these digital tools or the use of innovative teaching techniques. Schleicher (2020) stressed the inequities in access and digital competence of the students from underrepresented groups who are more at risk of falling behind due to limited access to ICT and insufficient support for autonomous learning. Sabiri (2020) emphasizes effective ICT integration for teachers to be equipped with not only basic technical skills but also with specific pedagogical competencies to promote students' language development, individualized learning, engagement, and access to high-quality educational resources. The study further highlights that integration of ICT is not simply about the presence of technology in the classrooms, but the meaningful and effective use of technology in improving pedagogical practices.

According to Poudel (2022), further reveals a surprising fact that though teachers demonstrate a positive attitude towards ICT integration in English language teaching classrooms, their classrooms remain the same as in the traditional classroom, perhaps due to several contextual factors. In this context, Lubis (2018), in a qualitative study of 13 English teachers in Indonesia, found that though teachers were positive towards ICT integration into their classrooms, they usually limit ICT to searching for materials and preparing presentations rather than enhancing language production, interaction, and communication. Moreover, teachers faced significant barriers, including limited time and technical challenges, which hindered deeper integration. Teachers quoted barriers such as lack of time, insufficient training, and technical difficulties. Similarly, Atyang et al. (2018) conducted a study in Bungoma sub-county, Kenya, and found that many schools were well-equipped with ICT tools, but their actual usage in classrooms was minimal. Teachers were found using traditional, lecture-based methods and lacked professional support for adapting ICT integration into their communicative and learner-centered language classrooms. One interesting fact was that even though the school leadership was positive and supportive toward ICT integration into classroom teaching, the real practice of ICT integration was hindered by inadequate infrastructure and limited access to continuous training. Such findings reflect the recurring challenges of the gap between stakeholders' intentions and classrooms' realities. This disparity between national or institutional policies for promoting ICT integration into classroom pedagogy and on-the-ground realities of the classroom implementation is a critical concern all over the world.

Musa and Garba (2019) surveyed the impact of ICT integration on mathematics learning among 115 students from both selected private and public secondary schools within Makurdi Metropolis, Nigeria, and found that the use of ICT in teaching mathematics not only improved the overall efficiency of the teaching process but also enhanced students' understanding of key mathematical concepts. The findings of this study highlight technology as a powerful tool in making abstract mathematical ideas more accessible and engaging for learners. Although their study did not focus on English language teaching directly, the implications are significant: if technology can demystify complex content in mathematics, it can be utilized in English language teaching too.

Khan and Kuddus (2020) explored the dynamics in the context of Bangladesh secondary schools. In their study, 100 English language teachers were involved and revealed that who had revealed that policy level support and initiatives for ICT integration into education had been increasing, the practical implementation lagged due to the infrastructure deficits, lack of training and institutional inertia. Teachers were found to be positive about using technology in their classroom, but hesitate to use it actually due to the context-specific resources and supportive mechanisms. The study stressed a systemic issue that though ICT policies might be positive and visionary, they fail to adapt their every day in their classroom teaching due to their teaching conditions and technological constraints in their rural or under-resourced settings. Such disconnects significantly limit the potential use of ICT to transform English language instruction in meaningful and effective ways.

On the other hand, studies show that the effective use of ICT integration into language teaching positively impacts learning pedagogies and outcomes. For instance, Assylzhanova et al. (2022) conducted a quasi-experimental study in Kazakhstan to assess the effectiveness of an ICT-enhanced blended learning approach on elementary school students' English achievement and their attitudes toward English lessons. The study found that the students who received instruction through a computer-aided blended curriculum outperformed their peers who were taught in traditional settings. The integration of multimedia tools and interactive activities not only supported their academic achievement and retention but also fostered a positive attitude toward language learning. In the same vein, Bhandari and Bhandari (2024) explored ICT integration in secondary ELT classrooms in Nepal using a phenomenological research design. This study found that digital tools enhanced student engagement, improved

cognitive processing, facilitated independent learning, foster learners' autonomy and created more dynamic classroom activities. This research emphasizes the importance of equipping teachers with digital skills and encourages broader implementation of ICT in Nepalese public schools to improve English language instruction.

Another study in English language education relates to its impact on students' literacy development. Purwanto et al. (2025) explored the role of ICT in enhancing students' English language literacy in Indonesia, particularly in the context of low literacy levels identified by PISA assessments. The findings revealed that ICT integration significantly strengthens students' literacy skills, especially in text understanding and critical analysis. The study further highlights that with increased accessibility, interactive learning experiences, and the use of modern digital tools, ICT presents a compelling alternative to traditional instruction. It not only enhances student engagement but also promotes deeper cognitive development in language learning. Despite challenges like unequal access and resource distribution, the research affirms the transformative potential of ICT in advancing both English language learning and overall literacy development in the Indonesian context.

Across these studies, ICT has the potential to make a real difference in how English is taught and learned. Teachers generally see its value, as shown by Lubis (2018) and Atyang et al. (2018), but they often face obstacles like lack of training, time, or school resources. Khan and Kuddus (2020) pointed out a similar challenge—many schools have policies encouraging ICT, but real classroom use does not always match. On the brighter side, other studies show how impactful ICT can be when used well. Assylzhanova et al. (2022) and Purwanto et al. (2025) found that students not only learned more effectively but also felt more engaged and confident. Musa and Garba (2019) showed that even complex subjects became easier to understand with technology. Together, these findings remind us that with the right support, ICT can do more than just enhance lessons—it can transform the learning experiences. Furthermore, this review reveals a significant research gap: there is a lack of robust, context-sensitive and outcome-focused studies that examine how ICT-integration actually influences English language teaching at the secondary level in community school settings, particularly in developing countries, like Nepal. Thus, this study attempts to examine the effectiveness of ICT in enhancing the teaching and learning of English at secondary level and to explore students' perceptions of learning English through ICT tools.

Method

This study adopted an experimental research design, using both a pre-test and a post-test to assess the impact of the intervention. The focus group consisted of grade nine students studying English language at a public secondary school in Bagmati Municipality, Sarlahi district. A total of 60 students participated in the study. They were divided into two groups: 30 students in the control group, who did not receive any special instruction, and 30 students in the experimental group, who were taught using the intervention. Additionally, 30 students were randomly selected from the same school to take part in interviews for more detailed insights.

In order to collect primary data, an achievement test with 50 multiple-choice questions was prepared. Each question had four options, but only one was correct. The content validity of the test was confirmed by a university professor, a lecturer, and a high school teacher. Before using the test in the main study, a pilot study was carried out with 20 students from a different school to check the reliability and difficulty level of the questions.

The study also included a ten-item attitude scale to measure students' views on using ICT tools in EL. This scale used a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree." The questionnaire was adapted from a study by Shadaan and Leong (2013) and included statements about how students perceive the use of ICT in English language learning.

Before collecting data, the researcher visited the selected school to build a good relationship with teachers and administrators. After explaining the purpose of the study, the researcher sought permission to work with grade nine students for two weeks. A coin toss was used to fairly assign students to the control or experimental group.

Both groups took a pre-test at the start of the study. Then, after the teaching sessions were completed, a post-test was given to both groups with help from the school administration. The results of the pre-test and post-test were compared to analyze the impact of ICT-based instruction. Efforts were made to control external factors as much as possible during both testing phases.

Findings and Discussion

Both control and experimental groups took the pre-test first. The pre-test was administered to both the control and experimental groups. The results include detailed

information such as the mean scores, standard deviation, variance, and the calculated t-value for each group. These figures help compare the academic performance of students in both groups before any intervention was applied.

Table 1

Presents the Summary of These Pre-Test Results for Both Groups

Group	Sample size	Mean	S D	Variance	T-value	Remarks
Control	30	6.91	5.63	31.69	0.79	0.79<2.00
Experimental	30	7.84	5.69	32.38		

Source: Field survey, 2025.

The data in Table 1 presents the pre-test performance of students in both the control and experimental groups. The average (mean) score for the control group was 6.91, while the experimental group scored a slightly higher average of 7.81. The control group had a standard deviation of 5.63 and a variance of 31.69, whereas the experimental group had a standard deviation of 5.69 and a variance of 32.38. A statistical t-test was conducted to compare the two groups, resulting in a t-value of 0.79. Since this is lower than the critical t-value of 1.96 at the 0.05 significance level for a two-tailed test, it indicates that the difference in scores is not statistically significant. Therefore, the null hypothesis—which assumes no difference between the groups—was accepted. This means both groups had almost the same level of ability before the teaching intervention began.

Both control and experimental groups took the Post-test.The post-test was administered to both the control and experimental groups. The results include detailed information such as the mean scores, standard deviation, variance, and the calculated t-value for each group. These figures help compare the academic performance of students in both groups after intervention was applied.

Table 2

Presents the Summary of These Post-Test Results for Both Groups

Group	Sample size	Mean	S D	Variance	T-value	Remarks
Control	30	15.63	8.53	72.76	2.611	2.611>2.00
Experimental	30	20.35	8.74	76.39		

Source: Field survey, 2025.

Table 2 presents information about the students in both the control and experimental groups, along with their average post-test scores of 15.63 and 20.35, respectively. The control group had a variance of 72.76 and a standard deviation of 8.53, whereas the experimental group's variance and standard deviation were 76.39 and 8.74, respectively. When comparing the calculated t-value of 2.611 to the critical t-value of 1.96 at a 0.05 significance level for a two-tailed test, it is clear that 2.611 is greater than 1.96. Therefore, the null hypothesis was rejected, indicating a significant difference in post-test achievement between the experimental and control groups.

Result of students' perceptions towards ICT tools in the learning mathematic.

The following table shows the students' perceptions about the use of ICT in teaching EL as well as the chi-square values for each statement:

Table 3

Results of students' Perceptions Towards ICT Tools in the Learning EL

Statements	Response					χ^2	Present	Result
	SA	A	UD	D	SD			
ICT tools enhance concept comprehension	14	10	4	2	0	39.34	82.75	Positive
AI tools facilitates efficient learning	19	10	1	0	0	85.45	100	Positive
ICT increases classroom engagement	19	6	4	1	0	79.84	86.20	Positive
ICT supports personalized and self-regulated learning	20	7	2	1	0	85.06	93.30	Positive
ICT and AI improve academic performance	14	11	4	1	0	69.42	86.20	Positive
ICT and AI make assignments more enjoyable and effective	16	8	4	2	0	72.69	82.75	Positive
ICT and AI foster interactive learning environments	9	14	7	3	0	57.23	79.31	Positive

Statements	Response					χ^2	Present	Result
	SA	A	UD	D	SD			
Confidence in using digital and AI learning platforms	18	7	3	2	0	78.42	86.20	Positive
Enthusiasm toward new ICT tools in Education	12	13	4	1	0	65.25	86.20	Positive
Need for ICT and AI integration in classroom instruction	18	9	3	0	0	80.23	93.10	Positive

Source: Questionnaire Survey, 2025.

Table 3 presents the results of students' perceptions toward the use of ICT and AI tools in learning the English language (EL). All the statements received statistically significant responses, as indicated by their chi-square values at the 0.05 level, showing that students' opinions are meaningful and reliable. The data reveals that all students agreed ICT tools help them understand EL concepts better. For instance, the findings reveal that a significant 82.75% of respondents believe ICT tools enhance their comprehension of complex concepts, while a remarkable 100% perceive AI-powered educational tools as facilitating more efficient and accessible learning experiences. Furthermore, the data indicates high levels of engagement, with 86.20% reporting increased engagement when ICT technologies are incorporated. Participants also appreciate the personalized learning pace offered by ICT tools, with 93.30% agreeing that these tools enable self-regulated learning. The positive impact extends to academic performance, as 86.20% perceive a positive effect on their academic results through ICT and AI integration, and 82.75% find completing academic tasks more enjoyable and effective using these resources. Respondents also largely agree that these technologies contribute to a more interactive and stimulating learning environment 79.31% and feel confident navigating digital learning platforms and AI-driven assistanances 86.20%. The enthusiasm for exploring new ICT in education is high at 86.20%, and there is a strong belief among 93.10% of respondents that it is essential for educators to incorporate ICT and AI tools into routine classroom instruction. In essence, the table comprehensively demonstrates a strong, consistent endorsement of ICT and AI's beneficial role in enhancing various facets of the learning experiences.

Discussions

The findings of this study confirm the transformative potential of ICT integration in improving English language learning at the secondary level. Although the pre-test results showed no significant difference between the control and experimental groups, the post-test results demonstrated a statistically significant improvement in the performance of the experimental group, confirming the effectiveness of ICT-enhanced instruction. This aligns with studies by Assylzhanova et al. (2022) and Bhandari and Bhandari (2024), which found that ICT not only supports academic achievement but also encourages student engagement, autonomy, and cognitive development. Additionally, the perception data further highlights these outcomes, as most students responded positively to the use of ICT and AI tools in their English language learning, reporting improvements in comprehension, engagement, self-regulation, and overall learning enjoyment. Despite these promising outcomes, broader literature and contextual realities caution against assuming continuous integration. Studies by Lubis (2018), Atyang et al. (2018), and Khan and Kuddus (2020) show that although teachers may express positive attitudes towards ICT, practical implementation is often hampered by limited training, infrastructure issues, and contextual constraints. This disconnection between positive perceptions and actual classroom practices highlights a recurring challenge: the gap between policy-level enthusiasm and real-world conditions. Therefore, this study emphasizes that meaningful ICT integration relies not just on access to technology but also on ongoing teacher training, pedagogical support, and systemic reform. Moreover, it highlights the need for more context-sensitive, outcome-focused research to guide policy and practice for ICT integration in English language classrooms in developing countries.

Conclusion

An experimental study investigated the significant positive impact of integrating ICT into English language teaching for secondary-level students. The research utilized an experimental design, confirming through a pre-test that both control and experimental groups were academically comparable before the intervention. After the experimental group received ICT-based instruction, a post-test was administered, revealing a clear and statistically significant improvement in their academic performance compared to the traditionally taught control group.

This outcome strongly suggests that incorporating ICT tools in teaching learning enhances student learning more effectively than conventional methods alone. The study highlights that ICT is not just a supportive tool but actively transforms the learning experience, leading to improved student engagement, comprehension, and overall achievement. Secondary-level students responded favorably, demonstrating increased motivation and participation, which aligns with global educational trends emphasizing digital tool integration. Moreover, ICT supports the creation of high-quality, engaging, and personalized educational materials, helping to bridge learning gaps. Therefore, the study concludes that educators and institutions should be encouraged to adopt and invest in ICT resources to prepare both teachers and students for success in the modern digital learning environment.

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