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Exploring the roles of technology and self-regulated learning in enhancing students' English competence

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Abstract

Advancements in information technology for e-learning provide the broadest possible opportunities for students to develop active, independent learning (self-regulated learning). This research explored the roles of technology and students' self-regulated learning (SRL) in developing students' English competence. The respondents of this study consisted of 5 university lecturers and 40 students. Data related to English achievement were collected by administering mid-semester tests and final semester tests. Questionnaires and interviews were conducted during the learning period. This study found that the students' academic achievement improved after implementing self-regulated learning. Students who received instruction in self-regulation skills exhibited a greater academic accomplishment score. The students' efficacy of digital tools is enhanced when combined with robust self-regulated learning practices. The benefits of technology-supported learning environments were greater for students with high levels of metacognitive awareness, which resulted in noticeably greater advances in English proficiency. Additionally, their enthusiasm for learning improved, resulting in a more proactive approach to addressing their learning challenges. Therefore, university lecturers should encourage their students to develop self-regulated learning strategies intensively. Moreover, technology should be integrated into both classroom and outside-classroom learning. Deliberate instructional design that incorporates digital learning resources and explicit instruction in self-regulated learning is necessary for long-term gains in English proficiency.

Keywords: Competence, English, Exploring, Self-regulated learning, Student, Roles, Technology.

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Contents

Contribution of this paper to the literature

The originality of this study lies in its specific focus on investigating the roles of technology and self-regulated learning in developing students' English competence. The students' English competence improves after the implementation of self-regulated learning and the integration of technology in English learning. The research findings enhance education by offering evidence-based insights that improve teaching methodologies and learning outcomes.

1. Introduction

Through technological advancements, particularly in information technology, many experts believe that kids expect active learning experiences backed by multiple media. Numerous learning materials available on the Internet can help pupils learn. Online learning uses the internet network with its accessibility, connectivity, flexibility and ability to provide various learning interactions (Maba, Widiastuti, Mantra, Suartama, & Sukanadi, 2023). Students benefit significantly from having ready access to various learning materials and information. Furthermore, establishing autonomous learning, also known as self-regulated learning (SRL), is a crucial component for students' success in addressing learning challenges during this pandemic (Dalimunthe, Sutisna, Zakiah, & Handayani, 2021). Self-regulated learning is not merely a mental capability for academic success; rather, it is the process by which pupils transform their cognitive abilities into academic competencies. Students who self-regulate their learning will perceive learning as well-executed proactive tasks (Hudaifah, 2020).

Students must employ self-regulated learning (SRL) techniques to succeed in their academic pursuits. SRL tactics and academic success are closely related (Cai, Wang, Xu, & Zhou, 2020). Students who employ SRL methods outperform those who do not use SRL tactics in terms of educational attainment (Ardiansyah, Yusuf, Subagya, & Atmojo, 2023). Because the function of SRL in supporting student learning achievement is so critical, it is essential to design numerous learning alternatives that can enhance it (Ateş, 2024). As we enter the information and communications technology (ICT) age, the relevance of employing ICT is felt in many aspects of life. The creation of the Internet is one of the most incredible technical breakthroughs of our time.

Indonesia has great potential to align itself with developed countries in diverse facets of life, including education. The advancement of internet information technology has provided virtual interaction spaces and an abundance of information and resources that are easily accessible and quickly available (Urbina, Villatoro, & Salinas, 2021). Because the boundaries of space and time in the learning process are increasingly open and even felt to be slowly disappearing, various daily activities, including educational activities, can be carried out more quickly, cheaply, efficiently, and democratically. If, in the past, the source of knowledge was centered on lecturers and formal educational institutions, it is now spread across various locations that cross institutional, geographical, and national boundaries. One of the learning models developed based on the Internet is cyber or electronic learning (e-learning). E-learning has catalyzed the conversion of traditional education into a digital format, both in content and systems.

The social cognitive perspective posits that academic achievement is a multifaceted interplay of individual capabilities, self-perception, task evaluation, success expectations, cognitive strategies, self-regulation, gender, parenting style, socioeconomic status, performance, and personal attitudes towards education (Higgins, Rathner, & Frankland, 2023). This indicates that both external and internal factors influence individual academic achievement. Learning is governed by both external and internal factors that are self-regulated (Ma & She, 2024). Consequently, learning should be active, productive, and self-directed (Cascolan, 2023).

Students who learn through self-regulation, in addition to progressing through the learning phases above, must also be able to apply various regulatory strategies in their learning (Tareen, Haand, Muhammadi, & Zhang, 2023). Self-regulation strategies in learning encompass three categories: cognitive regulation strategies, motivational regulation strategies, and academic behavioral regulation strategies (Villareal, 2023). Cognitive regulation strategies are methods for processing information related to various cognitive and metacognitive activities that individuals use to adjust and change their cognition, ranging from basic memory recall to more complex strategies (Tuilan, 2023). Cognitive strategies include rehearsal, elaboration, organization, and metacognition. The regulatory approach: motivation is a mechanism employed by humans to manage stress and emotions, facilitating efforts to overcome failure and achieve success in learning (Ma & Guo, 2023).

Self-regulated learning is influenced by three primary factors: self-confidence (or self-efficacy), motivation, and objectives (Sapulete, Laurens, & Gaspersz, 2023). Self-efficacy refers to an individual's conviction regarding their ability to acquire or perform a specific skill at a certain proficiency level (Utami, 2023). Moreover, motivation propels an individual toward a goal, anticipating outcomes from their activities and fostering trust in their abilities (Tareen et al., 2023). Goals serve as benchmarks for individuals to assess their learning advancement. The three factors above are noted. Specifically, objectives, motivation, and self-efficacy are closely related to self-regulated learning (SRL) (Paulina, Mutiah, & Panaemalae, 2023). Self-efficacy refers to the confidence individuals have in their ability to accomplish tasks, which in turn influences goal orientation, whether in learning or performance (Zahidi & Ong, 2023). Furthermore, higher self-efficacy enhances motivation to improve self-regulation, thereby facilitating the adoption of more self-regulated learning practices, which ultimately impact academic achievement (Akyıldız & Kaya, 2023).

Previous studies indicate that self-regulated learning correlates with academic success. For instance, studies undertaken (Gys, Haft, & Zhou, 2024) found that students' self-regulatory behavior from an early age helps predict

future academic success. Cleary and Russo (2024) found that learners who can utilize self-regulated learning strategies, particularly cognitive and metacognitive strategies, achieve higher academic success than those who cannot. Nabilah, Syamsuri, and Pujiastuti (2024) described a school climate that promotes self-regulation, which has a favorable influence on academic attainment (Kilag, 2024). Also, the SRL intervention program was designed to mitigate underachievement and enhance academic performance in primary school students (Ningsih, Darmanto, & Sumaji, 2024). Additionally, self-regulation strategies in learning strongly predicted self-efficacy and subsequently influenced achievement.

Previous studies have primarily investigated the phenomenon of self-regulated learning, which encompasses motivation, self-efficacy, and academic achievement. Only a few studies have examined the roles of technology and self-regulated learning in students' English competence. Therefore, this study was deemed necessary because technology in learning is widely used in education nowadays.

2. Literature Review

The integration of technology in language teaching has significantly transformed the approaches through which students achieve English competence. Digital platforms, multimedia tools, and online learning environments provide learners access to authentic content, interactive exercises, and immediate feedback that were previously unavailable in traditional classroom settings (Widiastuti, Weir, Sukoco, & Sulistyo, 2023). Lai (2023) asserts that technology in language education enhances student autonomy, boosts motivation, and provides opportunities for meaningful contact outside the classroom. Recent studies demonstrate that mobile-assisted language learning (MALL) and computer-assisted language learning (CALL) tools enable personalized learning pathways, permitting students to cultivate language skills at their own pace and according to their individual needs (Budiana, 2021). These technological advancements enhance language proficiency and promote digital literacy, which are crucial in the globalized environment of English usage.

Alongside technology, self-regulated learning (SRL) has emerged as a crucial factor in enhancing students' English ability. Self-Regulated Learning (SRL) refers to learners' ability to oversee their educational processes by establishing goals, monitoring progress, and reflecting on outcomes (Wirth, Stebner, Trypke, Schuster, & Leutner, 2020). In the domain of English language acquisition, self-regulated learners are more likely to utilize effective strategies, such as repetitive practice, vocabulary organization, and active language use in communicative contexts. Sangsawang (2020) posits that self-regulated learning (SRL) competencies, including time management, self-motivation, and self-evaluation, are critical indicators of academic achievement in language acquisition. The incorporation of technology augments self-regulated learning (SRL), as digital technologies require students to manage their study schedules, investigate online resources, and evaluate their performance.

The integration of technology and self-regulated learning cultivates an environment that enhances students' English ability. Studies demonstrate that when students possess technological tools that foster autonomy, they are more likely to utilize self-regulated strategies effectively (Teng, 2022). Digital platforms with progress tracking features enable learners to assess their achievements, while interactive applications enhance engagement and persistence in language skill development. Moreover, the adaptability of technology-enhanced learning environments promotes the growth of self-regulated learning by providing learners the liberty to choose when and how to engage in their studies. Thus, technology and self-regulated learning (SRL) play complementary roles: technology provides the tools and resources, while self-regulation ensures that learners effectively utilize them to achieve fluency in English.

3. Materials and Methods

This study employed a mixed-method approach that combines quantitative and qualitative research. This design, known as mixed methods, facilitates the integration of quantitative data analysis with comprehensive qualitative insights. This methodology enables the study to encompass and investigate both the quantitative and qualitative aspects of the research subject. This research was conducted in Indonesia to examine the impact of technology and self-regulated learning on enhancing students' academic proficiency. This study was conducted at Mahasaraswati University, Denpasar, Bali, Indonesia. Five university instructors were randomly selected as subjects for the study to gain insights from an instructional perspective. A total of 40 university students participated as responders, providing data on their learning experiences and outcomes. The selection of both instructors and students enabled the study to gain a more comprehensive grasp of the teaching and learning process in higher education.

The data collection procedure utilized three principal methods: semi-structured interviews, questionnaires, and document analysis. Semi-structured interviews were conducted with the lecturers to gather their thoughts, experiences, and perspectives on integrating technology and self-regulated learning procedures. Questionnaires were distributed to 40 students to collect quantitative and qualitative data regarding their engagement, techniques, and obstacles in learning. Document analysis was conducted by evaluating students' academic performance, particularly their mid-semester and final-semester examination results, to furnish quantifiable evidence of learning outcomes.

The data collected from various sources were evaluated descriptively to discern patterns and correlations among technology use, self-regulated learning, and academic success. Interviews and questionnaires were administered throughout the learning period to ensure that the results accurately reflected genuine teaching practices and student experiences. The examination of academic success data concentrated on comparing mid-semester and final-semester scores to assess potential improvement. This descriptive analysis sought to elucidate the role of technology and self-regulated learning in enhancing students' academic competency.

This study conducted a data analysis of student achievement by mean score analysis, including a sample of 40 students. The students' test scores were initially gathered from the assessment results and meticulously documented to prevent any errors in tabulation. The scores of each student were compiled in a table, and the aggregate score of all 40 students was computed. To calculate the mean score, the aggregate of these scores ($\sum X$) was divided by the total number of students ($N = 40$), using the formula $\bar{X} = \sum X/N$. The mean score functioned as the representative metric of the group's overall performance.

Furthermore, the data obtained from the questionnaire responses of 40 students were subjected to percentage

analysis. The questionnaire included four response categories: Strongly Agree (SA), Agree (A), Undecided (U), and Disagree (D). The responses in each category were initially quantified, followed by the calculation of the percentage using the formula: Percentage = (Frequency / 40) × 100%. This formula indicates that the percentage equals the frequency divided by 40, multiplied by 100%. This computation was performed for each response category across all items, enabling the representation of students' opinions in percentage form. The data were presented descriptively to provide a clear understanding of the findings.

4. Results

This study's data comprised students' performance in mid-semester and final semester examinations, findings from a questionnaire administered to the students, and extracts from the interviews. A pre-test was conducted with 40 students to assess their initial competence before training on self-regulated learning and technology utilization. Consequently, the outcomes are presented in the following tabulation.

Table 1. The tabulation of data showing the students' academic scores at mid-semester and final semester.

Test	Commutative score	Mean	Mean differences
Pre-test achievement	1986	49.65	19.15
Mid-semester achievement	2524	63.1	
Final semester achievement	3075	82. 25	

Table 1 presents the students' academic achievement in the mid-semester and the final semester. The test results of the mid-semester and final semester exams showed that students' academic scores improved after the training on using technology in learning and SRL. This can be seen from the data, which show that the pre-test score was 49.65, the mid-semester achievement was 63.1, and the final semester achievement was 80.25.

In addition, supporting data was collected by administering a questionnaire at the end of the self-regulated training. The data obtained through the questionnaire shows the students' responses after training on well-regulated learning strategies and the use of technology. The questionnaire was structured, and the results were analyzed using a Likert rating scale of 5-1. The questionnaire consists of ten questions with options including "strongly agree" (SA), "agree" (A), "undecided" (U), and "disagree" (D). The data shows the number of subject responses to each questionnaire item, tabulated as follows:

Table 2. The tabulation of data showing students' responses after training in self-regulated learning and the use of technology.

Qualification	Total Score	Percentage
Strongly agreed	820	48%
Agreed	460	27%
Undecided	308	18%
Disagreed	120	7%
Strongly disagreed	0	0%
Grand total score (GTS)	1708	100%

Table 2 presents the responses to the questionnaire after the training on self-regulated learning and the use of technology conducted with ten students. Based on the table of the questionnaire responses from the students, it is clearly shown that the application of self-regulated learning and the use of technology in education was positive, with 48% of the respondents strongly agreeing, 27% agreeing, 18% undecided, and 7% disagreeing on the implementation of self-regulated learning and the utilization of technology in education. Additionally, excerpts from conversations with university professors about self-regulated learning are provided below.

Lecturer A emphasized the importance of self-regulated learning for students, stating: "Self-regulated learning is essential for modern students as they need to actively engage in obtaining knowledge from various sources." Moreover, the development of self-regulated learning substantially improves students' academic performance (Lecturer A). This assertion posits that self-regulated learning is crucial in the current educational environment and significantly enhances students' academic achievement. The analysis reveals that the primary theme of this excerpt is the imperative of self-regulated learning for students.

Lecturer B emphasized the significance of self-regulated learning in improving student competence, stating: "Students must actively engage their self-regulated learning strategies to acquire diverse information and knowledge, thereby enhancing their academic and social proficiency." "Following my participation in training on self-regulated learning, they have exhibited increased engagement in their studies and achieved superior academic outcomes" (Lecturer B). The lecturer posits that the application of self-regulatory approaches facilitates students in achieving academic and social proficiency. The analysis demonstrates that self-regulated learning improves student proficiency.

Lecturer C highlighted the imaginative and analytical dimensions of self-regulated learning, asserting: "Self-regulated learning is one of the most effective strategies students should adopt to enhance their creativity and critical thinking, thereby improving their competence across diverse subjects." Instruction in self-regulated learning is essential for augmenting my students' drive to participate in more active learning. (Lecturer C). This viewpoint suggests that self-regulated learning fosters both knowledge acquisition and the development of creativity and critical thinking, which are essential for student growth and development. The data indicate that self-regulated learning enhances students' creativity and critical thinking skills.

Lecturer D emphasized the substantial enhancement in student competence following the instruction, stating: "After the training in self-regulated learning, my students' competence improved significantly." Consequently, I urge pupils to enhance their self-regulated learning strategies perpetually (Lecturer D). This indicates that training in self-regulated learning enhances student competency and motivates them to refine their learning practices. The investigation reveals that self-regulated learning enhances competency and fosters further development.

Lecturer E observed substantial changes in student involvement and inventiveness after the introduction of self-regulated learning, stating: "After my students participated in training on self-regulated learning, I observed them

becoming more active in their learning activities through the application of self-regulated learning strategies." They exhibit more creativity in acquiring information from diverse sources (Lecturer E). This underscores that the instruction directly influenced student learning behavior, enhancing both their engagement and creativity. The analysis indicates that this excerpt emphasizes that training in self-regulated learning improves student engagement and creativity.

Interviews with university teachers regarding self-regulated learning can be summarized as follows.

Lecturer A emphasized the crucial importance of technology in facilitating students' learning, asserting: "Technology greatly assists my students in their educational pursuits." They are extensively utilized in the learning process. Numerous applications and educational platforms are utilized" (Lecturer A). This underscores that students are increasingly relying on digital tools, applications, and platforms to enhance their learning experience. The investigation reveals that students utilize a wide range of learning programs and platforms.

Lecturer B articulated that educational technology enhances student engagement, stating: "My students exhibited increased initiative in acquiring information when I permitted the use of learning technology." "I frequently permit my students to explore Google and utilize educational applications" (Lecturer B). This indicates that technology encourages pupils to seek information and engage actively in the educational process independently. The analysis demonstrates that pupils exhibit increased engagement in learning when technology is employed.

Lecturer C highlighted the need to use technology in education, asserting: "Technology is essential for integration in contemporary classrooms." It facilitates pupils' acquisition of knowledge from diverse sources (Lecturer C). This underscores that technology broadens access to varied knowledge sources and enhances students' learning. The analysis emphasizes that technology facilitates students' acquisition of knowledge from many sources.

Lecturer D highlighted the motivational influence of technology in the classroom, asserting: "Learning technologies significantly aid my students in their educational pursuits." "I observed that my students exhibit greater motivation to engage in activities when technology is integrated into their learning" (Lecturer D). This demonstrates that students' interest and readiness to participate in class activities increase with the integration of technology. The data indicate that pupils exhibit heightened motivation when technology is included in educational activities.

Lecturer E elucidated the significance of technology in enhancing the dynamism of learning activities, stating: "I consistently incorporate learning technology in my instruction, including artificial intelligence, as it invigorates the learning experience, particularly during student projects" (Lecturer E). This suggests that technology, particularly sophisticated instruments such as artificial intelligence, enhances the quality of project-based learning and supports students in completing their assignments. The analysis indicates that learning technologies assist students in achieving their educational objectives.

5. Discussion

The findings revealed that students' academic levels improved after participating in training on the application of technology in education and autonomous learning. The data shows that the pre-test mean score was 49.65, the mid-semester achievement mean score was 63.1, and the final semester achievement mean score was 80.25. Furthermore, the questionnaire results showed that the implementation of self-regulated learning and the utilization of technology in education was practical, with 48% of the responses strongly agreeing, 27% agreeing, 18% undecided, and 7% disagreeing.

According to the self-regulated learning interview, all professors concur that self-regulated learning is essential for students. Students become more competent as a result of self-regulated learning. Self-regulated learning encourages students to gather information from various sources in a more creative and effective manner. Self-regulated learning increases students' competency and motivation to grow. Training in self-regulated learning influences students' academic advancement. Similarly, Suan (2023) found that self-regulation is the capacity to manage, organize, plan, direct, and oversee behavior to attain a specified objective through the utilization of physical, cognitive, motivational, emotional, and social techniques.

Based on the interview results regarding the use of learning technology, all lecturers agreed that technology significantly aids students' learning. They put a lot of effort into learning. They utilize a variety of applications and learning platforms. Students were more engaged in gathering information when they were permitted to use learning technology. As a result, students are frequently allowed to use Google and learning applications. Nowadays, including technology in the classroom is critical. It enables pupils to study more and acquire knowledge from a variety of sources. Students benefit significantly from learning technology. Students are more motivated to participate in activities when they are permitted to use technology in their learning. Using learning technologies in the classroom, especially artificial intelligence, to make learning more engaging (Burns, 2019).

However, 5 out of 40 students had academic achievement scores that remained unchanged. This is because students often experience other problems related to self-perception and self-identity, such as confusion about their identity, difficulty making friends, a preference for being alone, and coming from broken families. This could be a contributing factor to their low academic achievement. Therefore, from a social cognitive perspective, educational achievement is perceived as a multifaceted interplay among individual capabilities, self-perception, task evaluation, success expectations, mental strategies, self-regulation, gender, parenting style, socioeconomic status, performance, and personal attitudes towards classroom learning. Apart from that, the attitude of students who prefer to be alone and struggle to make friends is also an obstacle to developing the subject's ability to self-regulate. Based on SRL theory, self-regulated learning can grow well in relation to the function of intelligence or maturity; however, the development process depends on social agents who can serve as models for the individual, such as parents, teachers, peers, or coaches (Panadero, 2023).

The results of this study indicated that students who received SRL instruction exhibited superior academic performance compared to those who did not receive such training. This research demonstrates that self-regulated learning instruction substantially enhances academic performance in pupils. The SRL intervention program is effective in mitigating underachievement and can improve students' academic performance (Tareen et al., 2023). The findings in this research also show that academic achievement is impacted by two factors: external and internal. Learning is governed not only by external factors but also by self-regulated internal factors. Consequently, learning must be dynamic, constructive, and self-directed.

Students achieve better academic results if they are aware and responsible, know efficient learning methodologies, and employ proficient self-regulated learning techniques. Research results have shown that individuals with effective self-regulation in learning can utilize numerous self-regulated learning strategies, particularly cognitive and metacognitive strategies, resulting in superior academic achievement compared to those who cannot employ them. Individuals exhibiting good self-regulation employ superior planning, organizational, and self-monitoring skills compared to those with inadequate self-regulation.

Questionnaire interviews conducted after receiving training also support the idea that self-regulated learning can be improved. Before receiving SRL training, subjects reported issues generally related to the following problems: low motivation or laziness to learn, lack of self-confidence, frequent studying or reading but easily forgetting the material, lack of interest in lecture content, absence of clear learning goals, perceiving course material as less important, feeling they do not have enough time to study due to other activities, often forgetting to complete coursework, submitting assignments late, rarely attending lectures, and frequently arriving late. These findings align with previous research by Sinnayah, Rathner, Loton, Klein, and Hartley (2019)

The interviews reveal that, prior to receiving training, the subjects in this study lacked the capacity and competencies to self-regulate throughout the learning process, encompassing cognition, motivation, and behavior. However, after receiving training during evaluation and follow-up, subjects could apply steps and several learning strategies based on self-regulation. Some subjects use strategies by emphasizing or saying specific reasons, ideas, or words to themselves to complete learning tasks, starting learning activities to satisfy curiosity, wanting to become more competent and make their parents proud, and wanting to increase independence and combining it with other regulatory strategies, such as making a summary of lecture material, creating keywords with funny terms that are easy to remember.

Some other students use strategies by employing certain words or reasons for ability purposes, such as wanting to complete assignments better than their friends in class and comparing their work with that of their peers. By using these regulatory strategies, students reported feeling more confident, better able to regulate their motivation, and more effective at managing time, as well as being more optimistic about achieving their learning goals compared to before the training. Additionally, their achievement index scores increased more than in the previous semester.

Self-regulated learning is influenced by three principal factors: self-efficacy, motivation, and personal objectives. Motivation and self-confidence influence how and why individuals learn effectively (Sönmez, 2023). Highly motivated individuals typically set more ambitious learning objectives for themselves, design learning activities independently, develop self-observation skills, and engage in self-evaluation during the learning process. Research indicates that students with elevated motivation and interest in the subject employ more self-regulated learning mechanisms than those with diminished motivation and interest. Generally, students who receive training exhibit higher academic success scores or demonstrate improvement compared to their performance before instruction (Zarei, Gandomkar, Sohrabpour, & Sandars, 2023).

Based on the discussion above, learning achievement and success in attaining objectives are contingent upon Self-Regulated Learning (SRL). Psychological research suggests that this influences the development of SRL through self-efficacy and social support. Self-efficacy refers to an individual's conviction regarding their ability to organize and execute a requisite task to attain particular outcomes. The primary determinant is self-efficacy, defined as the conviction that an individual can manage the issue and achieve a favorable result. The second aspect, social support, is categorized as an environmental factor. Social support encompasses the physical comfort and psychological assistance offered by friends and family members. Social support is reflected in the quantity of social interactions conducted by individuals within established connections, utilizing available resources in their environment.

6. Conclusion

The application of technology in education and self-regulated learning plays a crucial role in enhancing students' academic performance. Researchers suggest that research subjects with higher educational achievement scores after receiving training are expected to continue applying the training results to the learning process in subsequent semesters by employing more varied self-regulation strategies in cognitive, motivational, and behavioral aspects. Research subjects who are still unable to improve their academic achievement scores, as they may be suspected of having other complex problems, are advised to adopt a proactive attitude to resolve their issues as soon as possible and, if necessary, seek help from experts or professionals in their field. Researchers are advised to conduct more in-depth and intensive research regarding the utilization of technology in education and the more intensive application of self-regulated learning methodologies.

7. Originality Statements

This manuscript offers a novel contribution by analyzing the combined influence of technology and self-regulated learning (SRL) on improving students' English proficiency. This study uniquely examines the combined effect of technology on language learning and SRL strategies, emphasizing how digital tools can enhance learners' autonomy, motivation, and strategic learning behaviors. The originality of this work lies in its comprehensive approach, which integrates technology-enhanced learning with self-regulated learning theory, providing novel insights into the interaction between these two dimensions to enhance language competence. To our knowledge, no previous research has thoroughly examined the interplay between these two criteria in the realm of English language teaching, specifically within Indonesian higher education. This study consequently offers both theoretical and practical insights for the development of more effective, learner-centered English training.

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