Improving Writing Skills through Essay Writing via 'Write & Improve' for Error Analysis and 'Padlet' for Collaborative Writing & Peer Review

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Abstract

This study was carried out to improve the undergraduates' writing skills through essay writing via Cambridge English 'Write & Improve' synchronously in the classroom for error analysis and 'Padlet' asynchronously outside the classroom for collaborative writing and peer review. However, previous research proved that Cambridge English 'Write & Improve' and Padlet could enhance students' engagement in mastering writing skills. It also recommended that the students be allowed to self-correct the most recurring errors in their writing tasks through error analysis using 'Write & Improve', and the students should go through peer review by writing collaboratively using Padlet. In this study, the researchers employed a quantitative and cross-sectional study by gathering and evaluating the results of two research groups, the control and experimental groups, both in the pre-test and the post-test. The experimental group pursued the training through digital learning, while the control group used traditional learning. However, after the post-test, the researchers administered the Paired t-test, as the sample size is $\leq 30\ (n \leq 30)$, as part of the statistical analysis. The results showed that the calculated t (10.66) >tabulated t (1.740) proved that the writing assessment training was effective. The Null Hypothesis (H_0), which said that the training had no significant effect because there was no significant improvement in the experimental group after the training, was rejected, and the Alternative Hypothesis (H_1), which said that the training was effective because there was significant improvement in the experimental group after the training was accepted. Therefore, the findings demonstrated a subtle growth in the experimental group's writing skills in the post-test after three months of training.

Keywords: Essay writing, Write & Improve, Padlet, Control group, Experimental group

1. Introduction

Writing well is essential for language production, and its relevance grows when writing in English. However, it is considered a challenging skill, especially when students learn English as a Second Language (ESL), where they confront numerous writing obstacles (Fareed et al., 2016). Selvaraj and Aziz (2019) also emphasized that mastery of writing skills is indispensable because of its growing need in almost all walks of life. Therefore, it is essential in the global market for job aspirants to procure their dream job and flourish in it. People with good writing skills are likely to seize numerous job opportunities, as what the current business world and potential employers look for in their employees. Written communication is usually essential for employability and in the professional workplace. However, surprisingly, it is what most graduates are deficient in (Moore & Morton, 2017).

Nonetheless, students encounter numerous obstacles when attempting to acquire writing abilities. These difficulties include a lack of vocabulary, which is a barrier to practical writing skills because it is essential to sentence construction; a lack of grammar, which makes it difficult for students to write sentences with proper syntax; and poor spelling, which is another source of anxiety for students when learning writing skills because accurate spelling is conducive to positive writing skill development. In addition to these difficulties, students may encounter difficulties developing their writing abilities due to a lack of enthusiasm, preparation, or exposure to books and other reading resources (Moses & Mohamad, 2019). In this context, writing practice and exposure to receptive skills are also necessary to improve one's writing abilities. It was also recommended that a writing culture be fostered and opportunities for writing practice be offered (Fareed et al., 2016).Moreover, writing requires a wide range of knowledge and skills, causing students to lose interest. To produce quality writing, students must possess knowledge of punctuation, grammar, vocabulary, spelling, and sentence structure (Anyiendah, 2017).

Despite all these challenges in mastering writing skills, teaching English writing nowadays mostly goes on traditionally through grammar-based practices without implementing modern methods. Therefore, it is recommended that the students be allowed to self-correct the most recurring errors found in their writing tasks by analyzing the errors (Sajid & Siddiqui, 2015) through an automated writing evaluation system of Cambridge English 'Write & Improve' which can assess by providing instant feedback. In addition, Arimuliani et al. (2022) also suggested that teachers should evaluate their students' writing through peer review and collaboration. Going further, Lin et al. (2017) confirmed through their study that digital learning had better positive effects on learning outcomes and motivation than conventional learning, and it could enhance the students' engagement in learning and strengthen their experience with a combination of practice and assessment, thus promoting deeper learning. They also asserted that digital learning could be utilized to develop teaching strategies so students could learn effectively.

Considering all the challenges and suggestions of the previous research and the desperate need for research on improving the students' writing skills in the context of higher education, the researchers carried out this study, employing 'Cambridge Write & Improve' synchronously in the classroom for the students to self-correct the errors found in their writing through error analysis and 'Padlet' asynchronously outside the classroom for the students to write collaboratively for peer review. The use of 'Padlet' was also endorsed, as it improved students' essay writing by serving as the typical whiteboard for all the students to write on and review their work collaboratively (Arimuliani et al., 2022).

Fundamentally, the researchers identified the necessity of improving undergraduates' English writing skills, as various strategies came into the limelight that endorsed and signified the importance of writing skills for employability and in the professional workplace. However, with the intervention of digital learning, improving the students' writing skills has become conspicuously simpler than earlier. According to Dorji (2021), there is a desperate need for research on strategies to improve students' English writing skills in the context of higher education.

At this juncture, in light of the urgent necessity to implement a new strategy to assist students in improving their writing skills, this study focused on a couple of areas by engaging them in serious yet enjoyable learning synchronously and asynchronously through essay writing. The thrust areas include the incorporation of Cambridge English 'Write & Improve' synchronously in the classroom to help the experimental group self-correct and analyze the errors in their essay writing, and the other is the employment of Padlet asynchronously out of the classroom to help enhance the experimental group's collaborative learning and thus improve their writing through peer review which is a proven strategy for improving the students' quality of writing (Baker, 2016).

The researchers answered the following research questions to fulfil the desperate need to improve the undergraduates' writing skills through essay writing.

- Does the employment of Cambridge English 'Write & Improve' help the experimental group self-correct and analyze the errors in their essay writing?

- Does using Padlet help enhance the experimental group's collaborative learning and thus improve their writing through peer review?

- Is there any statistically significant improvement in the experimental group's writing ability after training at the level ($\alpha = 0.05$) with $v = n-1$ degrees of freedom?

The researchers could contribute to the existing research landscape by formulating research questions and consequent findings.

- Identifying the need for improving the undergraduates' writing skills through digital learning.

- Employing Cambridge English 'Write & Improve' synchronously to help the students self-correct their essay writing through its automated writing evaluation.

- Employing 'Padlet' asynchronously for collaborative writing and peer review to enhance the students' writing skills through essay writing.

This research limited the control group to just receiving traditional instruction and trained the experimental group through digital learning, using 'Write & Improve' in the classroom synchronously and Padlet outside the classroom asynchronously. Consequently, the significance of this research is evident through the significant growth in the experimental group's writing skills after the training. The results obtained by the experimental group before and after the intervention endorsed this study. Thus, this study benefited 21st-century learners, especially in strengthening their essay-writing abilities in English.

2. Literature Review

This literature review encompasses all the background research concerning the use and advantages of 'Padlet' and 'Cambridge Write & Improve' in improving writing skills through essay writing. It also dispenses the background study of using Padlet asynchronously and Write & Improve synchronously, along with the significance of synchronous and asynchronous learning in improving writing skills.

The COVID-19 pandemic unexpectedly shut down many educational institutions and opened a gateway for many new opportunities. One of those opportunities, the resurrection of digital learning, stands out. Synchronous learning is stressful at times, yet it creates a way for student collaboration, while asynchronous learning allows the students to self-explore the topics assigned to them. However, an amalgamation of synchronous and asynchronous learning led to a balanced education (Fernandez et al., 2022). The students like to blend synchronous and asynchronous e-learning for effective language learning. Synchronous sessions usually pressure the students to respond immediately.

However, they can observe how much deep learning occurs when they respond immediately, whereas asynchronous learning allows the students to respond at their own pace (Perveen, 2016). Moallem (2015) suggested combining asynchronous and synchronous learning methods provides the highest social presence and cognitive and emotional support. Previous research has also shown the advantages of synchronous learning in developing team performance.

2.1 Cambridge English Write & Improve

The integration of the Automated Writing Evaluation (AWE) tool 'Write & Improve' into language learning has been phenomenal in the context of higher education. This cutting-edge software, run by artificial intelligence, intrigues students' motivation for writing and revision. The author has also recommended the incorporation of 'Write & Improve' among language learners to develop their writing skills and suggested introducing it into teaching, learning, and assessment. This 'Write & Improve' of Cambridge Assessment English also provides instant feedback to avoid subjective human assessment and thus enhances students' writing ability at higher educational levels (Karpova, 2020). Write & Improve provides instant, automated, timely, effective, non-judgmental, and contextualized feedback. These traits of 'Write & Improve' help the students discover the errors in their writing and thus practice more to improve their writing. Combining automated and teacher-provided feedback is essential to significantly improve students' writing skills (Wali & Huijser, 2018). Providing timely feedback to the students has been so significant that they can jump to the next level in learning a language. Teacher corrective feedback asked for clarification directly and helped in the discussion, whereas Cambridge Write & Improve gave invaluable feedback instantaneously in the students' writing. However, the teacher's feedback and Cambridge English Write & Improve can make the students independent learners with appropriate guidance and instructions (Tursina et al., 2021).

Write & Improve employs machine-learning technology to identify errors in learners' written language. This tool identifies errors with 90% certainty and uses the learner's input data to imply its error patterns further. This technology can also scale the level of learners' language using the Common European Framework of Reference (CEFR). In addition, it delivers summative and formative feedback on learners' writing while giving them autonomy and engagement. This technology can also alleviate the students' anxiety during feedback, as they get it without facing the teacher. This type of feedback enhances the students' learning experience and heightens their motivation. Write & Improve positively impacts Postgraduate students' writing skills, and researchers have used it for a writing task self-evaluation of the Common European Framework of Reference for Languages (CEFR) concerning the writing rubric. The researchers also recommended the prospect of further research on 'Write & Improve' to teach several other groups of learners for various educational purposes (Kostikova & Miasoiedova, 2019).

2.2 Padlet in ESL Classroom

The change in teaching and learning methodology due to the COVID-19 pandemic has suddenly opened the threshold of a new era in the world of education. Teaching and learning online have been a significant concern for many teachers and learners during the pandemic. However, various educational technology tools have rescued the teaching and learning process during this miserable pandemic. Information and Communication Technology gradually gained the upper hand in education after the COVID-19 outbreak. Despite the utility of many educational technology tools for various reasons, learning writing skills requires a lot of special effort and conscientiousness from many learners, especially when there is no significant possibility of face-to-face interaction between teachers and students during the pandemic. However, it was identified that the EdTech tool Padlet had been a tremendous resource for teaching and learning Writing skills. In this hour of need, using Padlet to improve students' writing skills by collaborating with students and assessing their writing has brought considerable change in the teaching and learning process. The role of this learning tool, concerning the previous relevant research, has been pivotal in rooting out students' academic issues in writing.

Taufikurohman (2018) said that Padlet could be effectively used to teach writing descriptive text. It also provides a free multimedia user-friendly wall to encourage real-time participation of the whole class. Padlet is a tool that may be used to increase students' motivation to learn how to write, and it has been demonstrated that in the post-test given later in the research, the experimental group fared better than the control group (Ismawardani & Sulistyanto, 2019). Padlet is a notice board where the learners can collect ideas from and share their ideas. It also encourages students' creativity to create and gather information in one room, which helps improve writing (Saepuloh & Salsabila, 2020). However, its employment in the classroom, both physically and virtually, builds a consensus with students about learning new things with a positive intent, and the students who use technology for the sake of learning perform better than those who do not use it.

2.3 Padlet for Collaborative Learning

Padlet is an excellent online platform that connects students to learn collaboratively and enjoy learning on par with their peers. It broadens the standard platform so learners can share their ideas, knowledge, and information and acquire their peers' ideas. This way, it serves the purpose of collaborative learning (Rashid et al., 2019). Padlet can also be used for collaborative discussion through collective writing, and it helps to have peer review practices that amplify student writing skills integrated into all subjects and disciplines in higher education institutions in several contexts. The collaboration in writing using Padlet improved the organization and quality of the learners' writing, and it helped the learners realize their mistakes in their writing on Padlet. Apart from this, Padlet made their learning intriguing and allowed the learners to comment on their peers' work and get their comments. Padlet best serves cooperative learning in the name of group work, especially on one platform where the learners can write and go neck and neck with their peers and gain various ideas shared by the other users of Padlet. This pursuit of cooperative learning builds consensus among the learners on developing their writing ability by boosting their competitive spirit (Etfita & Wahyuni, 2021).

In pursuit of acquiring writing skills, collaboration and peer learning become indispensable. One learner sharing ideas with one's peers in addition to introspecting their writing abilities on par with their peers on the same platform, Padlet, and allowing other learners on the Padlet to critique their piece of writing through their comments and feedback certainly gives tremendous scope for improving the writing ability of the learners (Shuker & Burton, 2021). Thus, engaging students collaboratively in Padlet to improve their writing skills is a cakewalk for teachers.

2.4 Padlet for the Assessment of Writing

Jong and Tan (2021)stated that the findings obtained from their study stipulated the efficacy of Padlet as a tool for assessing writing skills. They said Padlet was an easy-to-use tool for reviewing and providing feedback on their writing. A Survey questionnaire given to the chosen group of students showed that most respondents considered Padlet an exciting and suitable tool for improving writing. Students relished the use of Padlet in the assessment of their writing. Dian et al. (2020) proved that applying Padlet in teaching and learning English writing procedure text could enhance students' writing skills. Padlet displayed a significant improvement in students' writing gradually from the preliminary test to the post-test conducted eventually.

Padlet successfully met the learning objectives and helped to assess the competencies of creativity, critical thinking, communication, and collaboration of the 21st Learning Skills. The findings suggest that using Padlet along with Google documents or slides helped students achieve better learning outcomes as Padlet connects the students to the utility of technology. It can also be a motivating tool for group presentations and individual writing activities.The integration of Padlet in ESL tertiary classrooms to improve English writing demonstrated that the students could develop new ideas, share knowledge from the activities, collaborate, and interact with their peers. Therefore, the author recommended using Padlet to add more value to the English writing domain (Mahmud, 2019). It was also used for the assessment of learning outcomes, results of assignment assessments, and peer review among students (Kharis et al., 2020). This way, the previous research about using Padlet in ELT ascertains that it could improve students' writing skills. Some researchers found it interesting to collaborate with students, and some utilized it in assessing their students' writing skills. Some other researchers used Padlet with Google Slides and documents, greatly enhancing their writing ability.

Our research optimized the novel way of using Padlet asynchronously and 'Cambridge English Write & Improve' synchronously as a supportive learning resource. 'Cambridge English Write & Improve' offers free writing practice covering all levels, including beginner (A1, A2), intermediate (B1, B2), and advanced (C1, C2) with 6 levels A1, A2, B1, B2, C1 & C2 aligned to 'The Common European Framework of Reference for Languages' (CEFR). This study was used authentically to help the students practice their writing in two levels: beginner (A1, A2) and intermediate (B1, B2). This way, using Padlet out of the classroom and 'Cambridge English Write & Improve' in the classroom proved phenomenal in improving the Engineering students' writing skills.

3. Methodology

3.1 Participants

In our research, twenty-eight Computer Science and Engineering students in the academic year 2022-2023 at Sri Vasavi Engineering College were the participants. The participants in this study were students from Sri Vasavi Engineering College in Tadepalligudem, Andhra Pradesh, who were enrolled in the first semester of their third year of Computer Science Engineering. This research was carried out as part of their third-year first-semester English theory course 'Professional Communication Skills-III'.

3.2 Materials

In this study, around 40 Computers with uninterrupted internet connectivity, provided by Sri Vasavi Engineering College for Cambridge English Write & Improve to be used synchronously in the classroom, mobiles asynchronously used by the students for the writing activities on Padlet, and CEFR writing rubric to assess the student's writing, were all considered independent variables. The course work of 'Professional Communication Skills-III' for the third year of the first semester in Computer Science Engineering and its lesson plan was considered the dependent variable. The researchers chose Padlet to help the experimental group practice their essay writing at home asynchronously. They used the CEFR writing rubrics to assess that group's practice sessions asynchronously at home. In contrast, the Cambridge English Write & Improve was used synchronously in the classroom for Automated Writing Evaluation.

3.3 Procedure

The researchers conducted a quantitative study by gathering and examining the experimental and control groups' data from the pre-and post-tests. The data was gathered from the pre-and post-test outcomes of the research groups, which included the control and experimental groups. This data was considered, including the range of marks for each level, as shown in Table 1, employed by the researchers in both the pre-test and post-test. This data has been collected only from Sri Vasavi Engineering College, Tadepalligudem, Andhra Pradesh, India. In this study, essay writing was instructed as part of the Computer Science and Engineering students' third-year first-semester theory coursework. Therefore, the prospects of not having the same course structure in other institutes nearby and, as a result, researchers' curricular inaccessibility to other institutes around and eventually the number of the sample size $n \leq 30$ have all limited the data to be collected from only one institute Sri Vasavi Engineering College.

Twenty-eight Sri Vasavi Engineering College students from Tadepalligudem, Andhra Pradesh, India, participated in this study. All these twenty-eight students went through a pre-test conducted conventionally on paper on May 25, 2022, which consequently led to the division of the two groups: the Control group of 12 students and the Experimental group of 16 students. In our research, the engineering students'

third-year first-semester theory course work, which comprises essay writing as part of the curriculum, the Experimental group of 16 students, unlike the other 12 students of the Control group, used Cambridge English Write & Improve synchronously in the classroom for Automated Writing Evaluation and Padlet asynchronously outside the classroom for collaborative writing and the exchange of peer review as well. The Control group of 12 students was given teaching instructions traditionally throughout our research. This group was exempt from using both the Padlet and Write & Improve.

As part of the procedure, the Control group practised traditionally and was not given instant feedback as they had not used 'Write & Improve'. The impact remained absent in the process as they were given feedback manually. However, the Experimental group was given feedback on their writing during their practice sessions on 'Write & Improve'. It helped them stay motivated and gain momentum throughout their learning in the research. This study has been the culmination of the very thought of engaging students in writing both synchronously and asynchronously using digital technology. For this reason, our research was actively carried out for about 3 months, from May 25, 2022, to August 27, 2022, by using Cambridge English Write & Improve synchronously in the classroom and Padlet asynchronously outside the classroom.

For the experimental group, essay writing was taught in the classroom on Cambridge English Write & Improve for around 45 days for two hours each, while the control group was instructed traditionally. However, the experimental group practised their essay writing on 'Cambridge English Write & Improve,' which consists of 3 levels: beginner, intermediate, and advanced, but particularly the first two levels, up to B2, were used for practice sessions. Essay writing, pertinent to the first two levels (Till B2 level), was practised in the physical classroom synchronously on 'Write & Improve' and given as assignments for asynchronous learning (outside the classroom) of students' essay writing on Padlet. The experimental group was asked to write a minimum of 25-word essays to a maximum of 200-word ones in and outside the classroom regularly. 'Cambridge English Write & Improve' was used in the classroom practice sessions to extract information with instant automated feedback. Subsequently, Padlet was used asynchronously, for which manual feedback was given. Students were trained to regularly give their grades and comments to their peers on their work on Padlet. It helped every student know their ability to be on par with their peers. This kind of approach bolstered their competitive spirit as well. Of course, apart from the students' comments, the researchers regularly gave constructive feedback to the experimental group. As part of our thorough research for over 3 months, a post-test was conducted on August 27, 2022, conventionally for both the control and experimental groups. Consequently, the experimental group could perform better in the post-test.

4. Results

4.1 Pre-test

The researchers administered a pre-test, traditionally on paper, to all 28 student participants on May 25, 2022. As a result, the control group (12 students) and the experimental group (16 students), were formulated based on the range of marks for each level, as shown in Table 1. The students who procured only the A1 level (as in Table 1) were considered the experimental group, and those who could get A2 and B1 levels were considered the control group. The researchers used the CEFR Writing Can-Do statements as writing rubrics and added a range of marks to each Can-Do statement, as shown in Table 1. These marks about the level were taken as A1: 0-25, A2: 26-50, B1: 51-75, and B2: 76-100 based on the CEFR writing rubrics below. However, Assessment Parameters for evaluating the students' writing were confined to the B2 level (Intermediate) of the CEFR concerning its Can-Do statements.

Table 1. Researchers' Marks aligned to the CEFR Writing Can-Do Statements

Researchers' Marks	CEFR Level	Assessment Parameters
76-100	B2	Can write clear, detailed texts on a variety of subjects related to his field of interest, synthesizing and evaluating information and arguments from a number of sources.
51-75	B1	Can write straightforward connected texts on a range of familiar subjects within his field of interest by linking a series of shorter discrete elements into a linear sequence.
26-50	A2	Can write a series of simple phrases and sentences linked with simple connectors like "and", "but" and "because".
1-25	A1	Can write simple isolated phrases and sentences.

In the pre-test results, among the control group (12 students), 3 students got B1 level with the marks 62, 69, and 72, and 9 students got A2 level with the marks 26, 29, 30, 31, 35, 38, 38, 41 and 43. The experimental group (16 students) reached A1 level with the marks 9, 10, 11, 12, 12, 12, 13, 15, 19, 20, 21, 21, 22, 23, 23, and 24. These were the marks of each student participant given by the teacher-researchers as per the Can-Do statements (Table 1).

4.2 Post-test

The experimental group was instructed using digital learning, whereas the control group received traditional teaching from the researchers

throughout the study for about 3 months, from May 25, 2022, to August 27, 2022. The researchers employed Cambridge English Write & Improve synchronously in the classroom and Padlet asynchronously outside the classroom to enhance the essay-writing skills of the experimental group. After the training intervention, the researchers administered a post-test on August 27, 2022, to all 28 students to find if there was any significant improvement in the experimental group's writing skills at the level ($\alpha = 0.05$) with v = n-1 degrees of freedom. Similar to the pre-test, the post-test was administered, and the performances of all 28 students were evaluated based on the range of marks for each level, as shown in Table 1.

Intriguingly, in the post-test, the experimental group performed better, based on the CEFR writing rubrics as in Table 1. In the post-test, nine participants from the experimental group were able to procure an A2 level with marks 26, 27, 29, 33, 34, 34, 35, 39, and 42. Six students could get B1 level marks: 54, 55, 57, 62, 62, and 64. Only one student stayed back in the A1 level with 22 marks. In contrast, seven students in the control group could get A2 with marks 25, 26, 26, 36, 37, 45, and 46. Five students could get to the B1 level of the CEFR writing rubric with marks 53, 57, 59, 63, and 65. Neither of the groups could attain the B2 level. However, the researchers statistically analyzed the experimental group's performance before and after training through the pre-test and post-test results. Interestingly, after three months of training, the experimental group could improve their writing skills through essay writing. The statistical evaluation of the outcomes obtained in the post-test displays a subtle growth in the experimental group's writing skills through their essay writing. To determine whether there was a significant difference between the experimental group's pre- and post-training scores, the researchers compared the scores of the experimental group on the pre-and post-tests. As a result, the researchers applied a Paired t-test as the sample size is ≤ 30 ($n \leq 30$) to statistically analyze the scores the experimental group received in the pre-and post-tests.

Below are the results of the pre-and post-tests taken by the experimental group before and after the training.
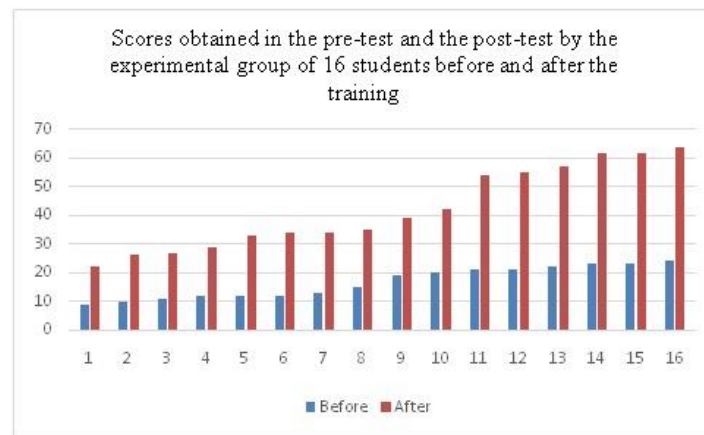

Figure 1. Scores obtained in the pre-test and the post-test by the experimental group of 16 students before and after the training

Based on the pre-and post-test results of the 16 students in the experimental group before and after the training, the researchers wanted to test whether the training was effective at the level ($\alpha = 0.05$) of significance with v = n-1 degrees of freedom to determine whether the experimental group's writing skills have improved in a statistically significant way after training.

The researchers administered the Paired t-test as the sample size is $\leq 30, n \leq 30$

Solution

Let us apply a Paired t-test.

First, the researchers employed two hypotheses. The Null Hypothesis and the Alternative Hypothesis are employed to conduct statistical hypothesis testing at a 0.05 significance level with v = n-1 degrees of freedom. The Null Hypothesis states that the training has no significant effect because there is no significant improvement in the experimental group after the training. At the same time, the Alternative Hypothesis considers the training effective because there is a significant improvement in the experimental group after the training.

Null Hypothesis (H_0): The training has no significant effect because there is no significant improvement in the experimental group after the training.

Alternative Hypothesis (H_1): The training is effective because there is a significant improvement in the experimental group after the training.

As part of the hypotheses employed, the researchers wanted to ascertain whether the experimental group's writing skills had significantly improved at the significance level ($\alpha = 0.05$) with v = n-1 degrees of freedom.

Based on the marks of the experimental group in the pre-test and the post-test (according to Figure 1), the researchers identified the Differences d_i as -25.5, Variance σ^2 as 92.13, and the Standard Deviation σ as 10.66. These findings led the researchers to determine the Test Statistic $|t|$ as 10.66.

Test Statistic

Differences (d_i) = -13, -16, -16, -17, -21, -22, -21, -20, -20, -22, -33, -34, -35, -39, -39, -40

$$\bar{d} = \frac{\sum_{i=1}^{n} d_i}{n}$$

$$\bar{d} = \frac{-408}{16} = -25.5$$

Variance $\sigma^2 = \frac{(d_1 - \bar{d})^2 + (d_2 - \bar{d})^2 + \ldots + (d_n - \bar{d})^2}{n-1}$

$= (-13+25.5)^2 + (-16+25.5)^2 + (-16+25.5)^2 + (-17+25.5)^2 + (-21+25.5)^2 +$

$(-22+25.5)^2 + (-21+25.5)^2 + (-20+25.5)^2 + (-20+25.5)^2 + (-22+25.5)^2 +$

$(-33+25.5)^2 + (-34+25.5)^2 + (-35+25.5)^2 + (-39+25.5)^2 + (-39+25.5)^2 +$

$(-40+25.5)^2 / (16\text{-}1)$

$= 156.25 + 90.25 + 90.25 + 72.25 + 20.25 + 12.25 + 20.25 + 30.25 + 30.25 + 12.25$

$+ 110.25 + 72.25 + 90.25 + 182.25 + 182.25 + 210.25 / 15$

$$\sigma^2 = \frac{1382}{15} = 92.13$$

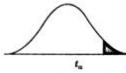Standard Deviation $\sigma = \sqrt{92.13} = 9.59$

Test Statistic $|\mathbf{t}| = \frac{\bar{d}}{\frac{\sigma}{\sqrt{n}}} = \frac{-25.5}{\frac{9.59}{\sqrt{16}}} = \frac{-25.5}{\frac{9.59}{4}} = \frac{-25.5}{2.39} = 10.66$

Tab $t_{0.05}$ with 17 d.o.f is 1.740 (from the statistical table- Figure 2 below)

However, the researchers in this study used the statistical table below (Figure 2) to test the hypotheses and calculate the required probability as an area under the curve at the level (α = 0.05) with v = n-1 degrees of freedom. Fundamentally, Figure 2 below shows the critical values of the t-distribution with v degrees of freedom, which are employed in hypothesis testing when working with small sample sizes and when the population standard deviation is unknown. These crucial values aid in choosing the thresholds for accepting or rejecting a null hypothesis. Whenever we perform a t-test, we compare the estimated t-statistic from our sample data to the crucial values from the t-distribution to decide whether to accept or reject the null hypothesis. The null hypothesis frequently assumes no discernible difference between two groups or that a population parameter has a specific value. The estimated t-statistic may be used to reject the null hypothesis if it is outside the crucial zone indicated by the critical values. In addition, When α is set appropriately, the t table can be used for one-sided (lower and upper) and two-sided tests. The significance level, α, is demonstrated using a t distribution with 10 degrees of freedom. α = 0.05 is the most commonly used significance level. We calculate 1 - α/2 for a two-sided test or 1 - 0.05/2 = 0.975 for α = 0.05. We reject the null hypothesis if the test statistic's absolute value exceeds the critical value of 0.975. We only tabulate the positive critical values in the table below due to the t distribution's symmetry.

IX. VALUES OF t

d.f.	t.100	t.050	t.025	t.010	t.005
1	3.078	6.314	12.706	31.821	63.657
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.499
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947
16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898
18	1.330	1.734	2.101	2.552	2.878
19	1.328	1.729	2.093	2.539	2.861
20	1.325	1.725	2.086	2.528	2.845
21	1.323	1.721	2.080	2.518	2.831
22	1.321	1.717	2.074	2.508	2.819
23	1.319	1.714	2.069	2.500	2.807
24	1.318	1.711	2.064	2.492	2.797
25	1.316	1.708	2.060	2.485	2.787
26	1.315	1.706	2.056	2.479	2.779
27	1.314	1.703	2.052	2.473	2.771
28	1.313	1.701	2.048	2.467	2.763
29	1.311	1.699	2.045	2.462	2.756
inf.	1.282	1.645	1.960	2.326	2.576

Figure 2. A statistical table showing the critical values of the t-distribution

Conclusion: According to the results of the experimental group before and after the training and subsequent statistical analysis, the researchers found that there was a significant improvement in the experimental group's essay-writing skills because of the digital training given to them through the employment of Cambridge English 'Write & Improve' in the classroom synchronously and the use of Padlet out of the classroom asynchronously. It was statistically justified as the Test Statistic, i.e., Calculated t (10.66) >Tabulated t (1.740) according to Figure 2. Therefore, the researchers rejected the null hypothesis, which states that the training has no significant effect because there is no significant improvement in the experimental group after the training and at the same time, accepted the alternative hypothesis, i.e., that the writing assessment training is effective because there is a significant improvement in the experimental group after the training at the 0.05 level of significance, as the findings showed statistically significant improvement in the experimental group's writing ability after training at the level ($\alpha = 0.05$) with $v = n-1$ degrees of freedom.

5. Discussion

Our research was carried out to enhance engineering students' writing skills, mainly through essay writing, using Cambridge English Write & Improve synchronously in the classroom for practice and Padlet asynchronously for assignments at home. Practice sessions taken on 'Write & Improve' that works by a class of Artificial Intelligence known as Supervised Machine Learning, in the classroom were given instant and automated feedback, while the assignments to the students to do on Padlet at home were given feedback through the comments and peer review for collaborative learning. This research lasted 3 months, from May 25, 2022, to August 27, 2022.

In this study, Cambridge English Write & Improve was employed synchronously in the classroom for the students to self-correct the errors found in their essay writing through error analysis (Sajid & Siddiqui, 2015), supporting the first research question of this study. It also provided instant feedback to avoid subjective human assessment and thus enhanced the writing ability of undergraduate students (Karpova, 2020). The automated writing evaluation of Write & Improve was timely, effective, non-judgemental, and contextualized (Wali & Huijser, 2018). Apart from this, using Padlet outside the classroom for the students to collaborate with their peers for their peer review immensely fructified the study, supporting the study's second research question, as it enabled cooperation, collaboration, and reflection when face-to-face communication was not possible. However, this asynchronous online discussion was the gateway to all posts in discussions, which enabled the process of knowledge creation (Gasparic & Pecar, 2016). It was also an effort to enhance student interaction and motivation that ensured the continuity of learning during asynchronous meetings, particularly in the absence of synchronous meetings (Al Momani& Abu Musa, 2022). The students positively perceived online learning through Padlet, as it helped the teacher design the lesson creatively, and the students experienced different learning experiences through digital tools to meet the learning objectives (Ahmad et al., 2022).

In this study, digital learning backed up deeper and self-directed learning and was considered higher than traditional learning. The nature of learning by integrating digital technology into the curriculum intrigued students' learning and motivation and opposed the superficial and monotonous way of memorizing and regulating the facts (Nalini et al., 2020). This study discovered that the outcomes of the post-test

justified a substantial growth in the experimental group's writing skills through essay writing after three months of training. The results of the post-test proved that the writing assessment training is effective at a 0.05 significance level, meeting the third research question of this study. The results also demonstrated that the Calculated t (10.66) > Tabulated t (1.740). As a result, the Null Hypothesis (H_0) was rejected, and the Alternative Hypothesis (H_1) was accepted, i.e., the training was effective.

This study claimed the significance of feedback: with the proper support, students can be inspired to become autonomous learners through Cambridge English Write & Improve corrective feedback that aligns with the findings of Tursina et al. (2021). Incorporating Cambridge English 'Write & Improve' as an Automated Writing Evaluation (AWE) tool along with CEFR in the context of ESL in this study corroborates the study of Yannakoudakis et al. (2018). Apart from this, the employment of Padlet in this study for collaborative learning, which motivates the students to complete their tasks and interact with their group members outside the classroom, was backed up by the study of Rashid et al. (2019) and peer review as a strategy for enhancing students' writing skills was supported by the idea of Baker (2016).

6. Conclusion

This study has resulted from the very thought of engaging students in writing synchronously and asynchronously using digital technology. For this reason, this research was actively carried out for about 3 months, from May 25, 2022, to August 27, 2022, by using Cambridge English Write & Improve synchronously in the classroom and Padlet asynchronously outside the classroom. To sum up, essay writing was taught to the experimental group in the classroom on Cambridge English Write & Improve for around 45 days for two hours each, whereas the control group was instructed traditionally.

At the outset, the researchers administered a pre-test to all the twenty-eight Computer Science Engineering students of Sri Vasavi Engineering College, conventionally on paper, on May 25, 2022. The pre-test results helped the researchers divide the entire student group into two research groups: Control and Experimental. The control group included 12 students who reached the researchers' expectations through their performance, whereas the experimental group, which included 16 students, could not obtain the necessary score in the pre-test. After the pre-test, the researchers decided to train the experimental group using digital technology in the form of 'Write & Improve' and Padlet. The control group was exempt from the training and was traditionally given instructions in the classroom. During the study's intervention, the researchers made the experimental group practice their essay writing on 'Cambridge Write & Improve' up to the B2 level. This 'Write & Improve' provided instant feedback for the participants to know where they had erred in their writing. This practice was taken synchronously in the classroom for two hours a week as per the class timetable. However, the assignments were given to the experimental group to be done at home asynchronously, and they had a week to finish on 'Padlet' so they could get their peer comments for their writing throughout the week. Likewise, the study continued for over 3 months, from May 25, 2022, to August 27, 2022. The training in the classroom synchronously took place for 12 weeks, with 2 hours each, and the training out of the classroom asynchronously took place for 12 weeks. The researchers used 'Write & Improve' for the experimental group's synchronous learning and 'Padlet' for their asynchronous writing at home.

After over three months of training, the researchers administered a post-test conventionally on paper to all twenty-eight students on August 27, 2022. The researchers noticed a slight difference in performance between the control and experimental groups. The experimental group that followed through digital learning could significantly improve their writing after their three-month training. The significant difference in the results obtained by the experimental group in the pre-test and the post-test proved that the writing assessment training was effective.

According to the statistical analysis of the results of the experimental group, it was justified as the Test Statistic, i.e., Calculated t (10.66) >Tabulated t (1.740) (Figure 2). Consequently, the null hypothesis was rejected, which states that the training has no significant effect because there is no significant improvement in the experimental group after the training. At the same time, the alternative hypothesis, i.e., that the writing assessment training is effective because there is a significant improvement in the experimental group after the training, was accepted, as the findings showed statistically significant improvement in the experimental group's writing ability after training at the level (α = 0.05) with v = n-1 degrees of freedom. The results obtained by the experimental group before and after the intervention vindicated the significance of this study. These findings recommend employing Cambridge English 'Write & Improve' for error analysis through instant feedback and Padlet for collaborative learning through peer review, as this study proved effective for 21st-century learners, especially in improving their English writing skills through essay writing.

This research was confined to three-month training and a cross-sectional study. Therefore, this study might not have ensured the students' writing ability on a large scale. It was also limited to a small sample size, i.e., n $\leq$ 30. However, this study can be extended to a large sample size. A longitudinal study that multiplies the number of observations over time can produce better results. The findings of this study's post-test are encouraging for larger-scale, longitudinal research employing a similar methodology in the future. This study recommends digital learning for the improvement of writing skills. Cambridge English 'Write & Improve' can help the students self-correct the errors found in their writing as it gives them instant feedback. Using Padlet is also recommended for mastering writing skills collaboratively through peer review.

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Authors' Contributions

All authors contributed equally to the conception and design of the study.

Competing Interests

The authors declare that they have no competing interests.

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