

IMPROVING LEARNERS' ENGLISH WRITING SKILLS THROUGH DIGITAL TECHNOLOGY AND PROJECT-BASED LEARNING

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Abstract

This groundbreaking research endeavors to elevate participants' learning competence through the innovative integration of digital technology as a pedagogical medium. Pioneering a novel approach, this study seeks to gauge the efficacy of digital-based technology in enhancing English writing proficiency and participants' perceptions of its utility on the Storyboard That platform. Adopting a quantitative methodology, data is meticulously collected from experimental and control groups comprising nursing participants. Leveraging a synergistic blend of digital technology and project-based learning (PjBL), the research yields noteworthy gains in both knowledge and attitudes, with N-gain scores of 0.53 and 0.52, respectively. While initial trial results place competence and integration in the medium category, there exists a compelling imperative for further refinement and enhancement. The findings underscore the transformative potential of digital technology in augmenting writing skills and platform utilization, laying the groundwork for future innovations in English language education. By advocating for the seamless integration of digital tools like Storyboard That into the curriculum, this research not only fosters creativity and proficiency in English writing but also cultivates a dynamic learning environment conducive to holistic skill development. Ultimately, this study serves as a clarion call for educators to embrace the transformative power of digital technology in fostering English language proficiency and nurturing a generation of digitally literate and proficient learners poised to thrive in an increasingly interconnected world.

Keywords: English Writing, Project-based Learning, Technology in Learning



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INTRODUCTION

Project-based learning (PjBL) is essential in modern education (Hujjatusnaini et al., 2022) because it enables students to learn in real context, helping in the development of contextual skills. The students understand the theoretical aspect and the application in practical situations, thereby developing relevant skills for real life (Al-Busaidi & Al-Seyabi, 2021). According to Kortam et al., (2018), students tend to be more excited and invested in learning when engaging in projects of their choice or interest, leading to improved memory and understanding of the material. PjBL requires active participation in the planning, execution and evaluation of projects, promoting deeper engagement compared to passive learning methods (Matzembacher et al., 2019). It helps in the development of 21st century skills, including problem solving, cooperation, creativity, and communication (Hadinugrahaningsih, 2017), which are essential in the labour market. Therefore, the participants were encouraged to engage in choice projects, fostering independence through the management of time and resources (Surahman et al., 2018). PjBL also encourages creative thinking, innovative solutions, and new product designs (Anazifa & Djukri, 2017). According to Robinson (2013), PjBL presents a learning approach that focuses on problem solving, student engagement, and the development of relevant skills for the future, producing learners who are independent, creative, and ready to face the challenges of the modern world (Prasad et al., 2017).

Some studies have reported potential drawbacks associated with the implementation of PjBL integrating digital technology in English, despite the numerous benefits offered. Gawrisch et al., (2020), further stated that limited access to technology, especially in educational settings with budget constraints, can hinder the effectiveness of this learning method. The quality of digital content used in PjBL needs attention, as inappropriate or irrelevant content may hinder student learning (Han et al., 2015). Furthermore, assessment in PjBL that integrates technology can be challenging and time-consuming, due to difficulties in determining objective criteria (Herro, 2017). Chang & Kang, (2016) stated that students encounter difficulties in managing complex projects, especially when lacking experience in the use of technology. In addition, the impact of PjBL integrated with digital technology clarifies the improvement in English writing skills (Sudadi et al., 2021).

Technology-integrated learning development is a method that uses digital tools to improve the quality and effectiveness of education (Lawrence & Tar, 2018). This method fosters more interactive, collaborative and relevant learning experiences (Al-Samarraie & Saeed, 2018 ; Ansari & Khan, 2020; Yates et al., 2021). Technology-integrated PjBL is a highly effective in producing meaningful learning experiences using digital tools that support and enrich the learning process (Barak, 2018; Bereczki & Kárpáti, 2021). When identifying learning objectives through PjBL, it is essential to determine the competencies, skills, or knowledge acquired by students (Baghoussi & Zoubida El Ouchdi, 2019; Sholihah & Lastariwati, 2020). This includes selecting appropriate technology namely classroom devices such as computers, mobile phones or tablets, specialized software, applications, or specific online tools that support different aspects of the project (Nikolopoulou, 2020). In addition, the selection of projects in line with the learning curriculum focused on addressing relevant problems or challenges.

Digital learning resources such as videos, simulations, online references, and collaboration tools, support PjBL (Kumar Basak et al., 2018; Lau et al., 2018). It facilitates collaboration and communication, enabling students to share ideas, information, and project results (Blau et al., 2020; Vlachopoulos & Makri, 2019). In addition, students and teachers use technology to provide feedback on projects and learning processes, improving technology-based PjBL experience (Rifda Eliyasni, 2019). This served as a reflection material to improve future learning approaches and optimize the role of technology in supporting long-term learning (Nicholson, 2015). Therefore, evaluating the effectiveness of technology in PjBL is essential to make necessary changes (Almaiah et al., 2020; Jowsey et al., 2020). Therefore, the integration process leads to an engaging and immersive experience for students, while fostering critical skills development. With proper planning and support, technology becomes a powerful tool to enhance the PjBL approach in education.

Technology-integrated PjBL has a positive impact on student learning outcomes (Diana et al., 2021; Dogara et al., 2020; Hidayati et al., 2023) Engaging in technology-integrated PjBL encourages actively solving real problems, and project participation (Ronnie Homi Shroff, 2019), leading to increased student engagement and a sense of ownership (Tsybulsky & Muchnik-Rozanov, 2019). In addition, students have the opportunity to develop relevant technological skills, such as software proficiency, hardware understanding, programming, data analysis, etc (Al-Htaybat et al., 2018; Falloon,

2020). Technology-integrated PjBL also fosters collaboration among students, through team work (Vogler et al., 2018), and the use of various communication tools namely emails, and chats, as well as share ideas through multimedia presentations (Lee, 2021).

PjBL facilitates access to technology-related learning resources, enabling students to use various digital tools (Miller et al., 2021). These resources include online learning materials, databases, educational websites, and other digital platforms that enrich learning experience (Kai et al., 2017). Furthermore, by encouraging students to solve real-world problems, PjBL fosters a relationship between learning and practical situations (Ting et al., 2021). It helps in data collection, information analysis, and problem-solving. PjBL also promotes independent learning (Larson & Farnsworth, 2020), enabling students to access certain resources, solve problems, and personally search for information, which are essential skills for lifelong learning (Moore, 2020). This approach has a significant positive impact, and ensures equal access to technology as well as provides adequate training for teachers. In addition, careful planning and appropriate integration of technology in the curriculum are essential to realizing the benefits in student learning outcomes.

PjBL significantly contributes to the development of English writing skills (Sa'diyah & Cahyono, 2019), by engaging students in real and relevant language contexts (Yamada, 2021). Students also learn the rules of grammar, as well as language application in everyday situations and projects. Engaging in interesting and meaningful projects, leads to the intrinsic motivation to develop writing skills (Shin, 2018), affecting both quality and perseverance. PjBL also includes collaborative activities among students (van Blankenstein et al., 2019), facilitating communication, sharing of ideas, and providing feedback to teammates, enriching writing skills through social interaction. However, through research-based projects, it helps improve information-finding, data-analysis, and writing-presentation skills. PjBL projects often require the presentation of results in written form, fostering the development of writing skills related to producing reports, proposals or presentations.

Students, often engage in research-based projects, tasked with searching, collecting, and analyzing information, thereby improving academic and argumentative writing skills (Awada et al., 2020). Collaboration is an integral aspect of PjBL, as it encourages working together in teams to plan, organize and present assigned projects. This process develops writing skills, especially in drafting team reports and presentations. Moreover, students engage in projects specifically designed to improve writing skills, such as creating proposals, producing reports, or drafting guidance documents. According to (Safaruddin et al., 2020), students can use a variety of media and technologies to present project results, including the creation of blogs, presentation videos, or websites, all of which require diverse writing skills. Some PjBL projects are challenging, leading to the exploration of creative writing, including the development of stories, poems, or drama scripts that improves writing skills in various genres (Pentury et al., 2020). Engaging students in projects requiring the use of English provides a real and meaningful context, which in turn significantly improves writing skills. Although many studies have shown the effectiveness of PjBL, there is still a need for in-depth research on the use of digital technology in the context of English language learning.

The use of PjBL offers numerous benefits to the learning process, including fostering collaboration, problem solving, and enhancing the creativity of participants through the integration of digital tools. PjBL holds significant potential to contribute to English language learning, by facilitating the development of essential skills using digital tools. This research aims to determine the effectiveness of digital-based technology on projects carried out by participants in English language learning and to assess the level of creativity. In addition, to find the empirical impact of whether PjBL integrated with digital technology can provide significant improvement in English writing skills and gain an in-depth understanding of participants' perspectives on the use of digital technology in English language learning through PjBL. The main research questions are stated as follows: 1). Does PjBL, integrating digital technology improve English writing skills?; 2). What are the participants perceptions of using digital-based technology on the storyboard that platform in English language learning?

METHODOLOGY

This research applied a quantitative method on nursing participants from Health Science Colleges in Indonesia. The effectiveness was evaluated using N-Gain and division of test scores, carried out by pre-experimental methods (Khoiri et al., 2023), including comparing aspects of knowledge and attitudes before and after the application of digital technology and PjBL. In addition, questionnaire analysis measured perceptions of participants concerning the use of digital technology on the

storyboardthat platform, with responses collected through Google form (GF) using a likert scale with four options, namely strongly agree, agree, disagree, and strongly disagree. The participants produced projects in the form of videos uploaded to the Youtube channel, showcasing creativity in learning. This method was considered suitable for answering the two research questions regarding improving English writing skills and participants perceptions of using technology.

The research was conducted in the Nursing department of a private campus on the island of Sumatra in Indonesia. The participants were selected through random sampling techniques, with 35 participants (6 men and 29 women), and 28 participants (8 men and 24 women) assigned to the experimental and control classes, from semester 3. The participants selected are considered sufficient to provide reliable results. Despite being at the beginner level in English writing, all nursing participants found the course challenging. Similarly, the participants encountered difficulties in using technology, having been accustomed to traditional learning tools, such as textbooks. To address this, experimental participants received instructions using the storyboardthat platform, while those in the control received traditional writing techniques without technological media or tools. Thus, the findings from this study will provide valuable insights into the use of PjBL integrated with digital technology in English language learning.

The research procedure comprised several stages, a pre-test, followed by the use of the Storyboardthat platform to write simple sentences, and a post-test. After the post-test, the results of the project were disseminated through a YouTube channel. At the end of the experimental stage, participants were given the opportunity to fill out a questionnaire aimed at evaluating the diverse perceptions regarding the use of storyboardthat platform for learning English writing. The method of using technology on the storyboardthat platform for writing English in the form of simple sentences is as follows :

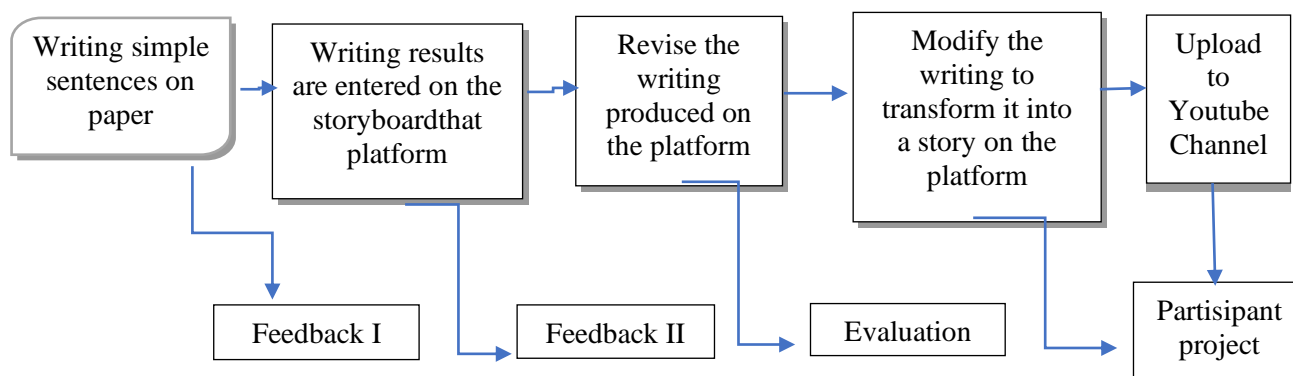


Figure 1. Stage of Platform Storyboardthat

Based on the research questions, a simple sentence writing test and a questionnaire were used to collect data. The writing test was conducted twice in both the experimental and control classes. The aim was to assess the ability of participants to write simple sentences, and each of the test comprised a total of ten sentences. After the test was completed, participants filled out a questionnaire aimed at exploring the perceptions of the storyboardthat platform usage in writing English. This questionnaire, designed using Google form (GF), comprised 11 items in a close ended manner scored on a Likert scale with options ranging from four to one, 4 = strongly agree, 3 = agree, 2 = disagree 1 = strongly disagree. It focused on two aspects, namely the use of the storyboardthat platform and the effectiveness in the language learning process. In addition, the questionnaire was adapted and modified from previous research.

Table 1. Grid of Questionnaire Instruments

Aspects	Number of Questionnaire	Total Item
The use of Flatform storyboardthat	2,3,4,5,6,7	6
The effectiveness of flatform storyboardthat	1,8,9,10,11	5

After validating and revising the model to ascertain the quality, the next step was to test the effectiveness compared to the old or traditional model. This testing included comparing knowledge and attitudes before and after the application of digital technology integration and PjBL, using a pre-experimental method. The usefulness was then interpreted based on the N-Gain effectiveness category and score distribution, as shown in Table 2.

$$\text{N-Gain} = \frac{\text{Skor Posttest} - \text{Skor pretest}}{\text{Skor Ideal} - \text{Skor Pretest}}$$

Table 2. N-Gain Effectiveness Interpretation Categories and Score Distribution

Percentage (%)	Interpretation	N-Gain Score	Category
< 40	Not effective	$g > 0.7$	High
40-55	Less effective	$0.3 \leq g \leq 0.7$	Moderate
56-75	Moderate Effective	$g < 0.3$	Low
>76	Effective		

Source: (Hake, 1998) Source: (Meltzer, 2002)

The test was conducted on 24 participants from nursing science, while an extensive assessment was carried out on 35 nursing students. From the results, the average values of the two aspects, namely knowledge and attitude, were obtained. According to Cámara-Zapata & Morales (2020), effective learning improvement is depicted by an average normalized gain higher than others. To evaluate this, the value of <g> needs to be determined. The stages of data analysis associated with improving skills, include the following steps, namely (1) determining the N Gain, (2) and assessing the impact size. The impact coefficient obtained was interpreted using criteria.

During the research, only participants in the experimental class provided feedback on the perceived use of storyboardthat platform for English language learning, particularly in writing. The responses from the questionnaires were recorded quantitatively and analyzed descriptively, with the number of frequencies counted to determine the average values stored in an excel file. The analysis aimed to determine the perception of participants on the influence of the storyboardthat platform, represented as a percentage of the average value. Two major aspects were analyzed, the use of the platform and usefulness in the English writing learning process. The parameters for interpreting the percentage values in Table 3 were grouped into four categories based on influence, categorized from the highest to lowest.

Table 3. Interpretation Parameter

Range	Interpretation
81 – 100	Most influence
66 – 80	Much influence
51– 65	Less influence
50 – 0	Least influence

RESULTS AND DISCUSSIONS

Preliminary Study Results

The integration of digital technology with PjBL improves the English writing skills of students (Aghayani & Hajmohammadi, 2019). By combining these approaches, students engage in more interactive and collaborative learning experiences. Platforms such as Google Docs or Microsoft Word Online, facilitates real-time collaboration, enabling students to collectively work on writing projects and providing direct feedback(Mehall, 2020). According to Cong-Lem (2018), the use of blogs or websites for project presentations, improves writing skills, as well as introduces students to the genre of online writing and understanding a wider audience.

Technology enables easy access to digital research resources such as online databases, e-books, and electronic journals. This accessibility empowers students to skilfully search for information effectively incorporate it into writing. Furthermore, using presentation media such as PowerPoint, Prezi, or Canva to deliver project findings (Sanchez, 2020), improves students’ skills in designing

presentations and effectively conveying information. The use of automatic editing and feedback tools namely Grammarly, provides instant feedback, helping students in correcting grammar mistakes and improving writing (O’neill & Russell, 2019). The use of multimedia elements such as images, audio and video, enriches the learning experience and helps students develop different writing skills (Yeh et al., 2020).

Peer-to-Peer evaluation using technology can be greatly enhanced with the aid of digital platforms, designed to facilitate sending and receiving feedback from classmates. Teachers can provide feedback in the form of audio or video comments, offering clarification and direction in a more direct and supportive manner. The integration of digital technology and PjBL enriches students learning experience and fosters an environment conducive to the sustainable development of writing skills (Rahmania, 2021). Various digital platforms are available to improve English writing skills, providing a range of resources, tools and interactive environments to support the learning process. Some examples include google docs, microsoft word online, grammarly, padlet, blogs (wordpress, blogger), medium, scrivener, storybird, canva, and book creator.

Several research reported that students engaged in PjBL with technology integration showed significant improvement in writing abilities compared to the control group (Aghayani & Hajmohammadi, 2019). According to Puangpungsi (2021), the use of digital tools in the context of PjBL, enhanced the writing skills of students. Furthermore, Shpeizer (2019), stated that the integration of mobile technology in PjBL fostered increased project engagement and improved writing quality. These findings collectively focus on the positive contribution of digital technology integration in PjBL to the development of English writing skills (Haniah et al., 2021). However, results may vary depending on the context, the technological tools used and the implementation of PjBL strategies.

Use of Digital Technology on Storyboardthat

Limited Model Trial Results

The model testing of digital technology integration and PjBL was carried out through small-scale and limited trials. Initially, a pre-test was used to assess the knowledge and attitude competencies in the experimental class. Following this, the lecturer made certain adjustments using the model, closing with a post-test at the end of the lesson. Table 4, shows the results of the pre-test, post-test and N=gain in the limited trial. The results of the pre-test showed that the average student knowledge was 37.3. After the implementation of learning and treatment there was a significant increase, with post-test results averaging 64.5. In terms of attitude, the results of the post-test increased to 70.3, after the learning implementation and treatment. However, on calculating the average normalized N-gain in the limited trial experiment, knowledge and attitude N-gain fell within the medium and low categories at 0.4 and 0.2, respectively. This finding showed that despite improvements in post-test scores, the application of this model did not significantly impact the enhancement of English writing skills.

Tabel 4. Limited Trial

Data Source (Gain)	Pre-test Average	Post-test Average	N-Gain Score	Category	N-Gain Percentage	Category
Knowledge	37.3	64.5	0.4	Moderate	43%	Less Effective
Attitude	60	70.3	0.2	Low	24%	Not Effective

During the limited trial, participants encountered several obstacles, including (a) still struggled with understanding writing techniques, particularly in applying proper grammar, for example distinguishing between present and past tense in sentences associated with daily activities, (b) many relied on tools such as GS (Google translate) for English writing support, (c) several errors were observed, especially in spelling, (d) the resulting project lacked creativity, (e) had not adapted to the storyboard platform.

Improvements to the Limited Trial Model

Based on the findings, responses, constraints, and input from the limited trial, the following improvements were implemented in the model (a) participants showed a better understanding of English writing techniques, adhering closely to grammar rules, (b) Some had not used GS (Google translate)

tools for assistance in English writing, (c) few errors observed in spelling, (d) there was a significant increase in creativity.

Integration Model Test Results

Table 5 shows the results of testing the digital technology integration model and PjBL on a larger scale conducted in similar universities. This extensive trial started with conducting a pre-test in the experimental class, followed by the implementation of a model treatment and ended with a post-test.

Table 5. Test of Integration Model

Data Source (Gain)	Pre-Test Average	Post-Test Average	N-Gain Score	Category	N-Gain Percentage	Interpretation
Knowledge	40	70.7	0.50	Moderate	50%	Less Effective
Attitude	72	91.4	0.67	Moderate	67%	Moderate Effective

The results of the pre-test showed that an average student knowledge score was 40. After the implementation of learning and treatment, the result of the post-test depicted a substantial increase, with students achieving an average of 70.7, showing significant improvement in knowledge competency. In the attitude aspect, the result of the post-test was 91.4, after the same treatment was implemented, showing significant enhancement. The calculation of the average normalized N-gain in the limited trial experiment, resulted in a knowledge and attitude N-gain of 0.50 and 0.67, respectively, both in the medium category. Table 5 shows that the magnitude of the impact on knowledge and attitude domains, suggested a moderate effect of the developed model on improving English writing skills.

Test of the Magnitude of Impact on Increasing Participant Competence

Table 6 shows the magnitude of the impact on improving both knowledge and attitudinal competencies. Based on these results, it was concluded that the use of the developed model had a moderate impact on improving competence.

Table 6. Impact Test Magnitude on Competency Improvement

Data Source (Gain)	Pre-Test Average	Post-Test Average	N-Gain Score	Category	N-Gain Percentage	Interpretation
Knowledge	43	75	0.53	Moderate	53%	Less Effective
Attitude	68.3	85	0.52	Moderate	52%	Less Effective

The results of the trial test in table 6 were obtained to determine the effectiveness of digital technology integration models and PjBL in improving competencies among nursing participants. The magnitude of the impact test showed a 0.53 and 0.52 increase in knowledge and attitude competencies, respectively from the limited trial results. These results showed that the use of the developed model has a moderate impact on increasing competence.

Based on the research results presented above, the effectiveness measured using N Gain and the division of test scores by comparing the knowledge and attitude aspects before and after the application of storyboardthat and PjBL. The results of the analysis were used to answer research questions about the improvement of English writing skills and participants' perceptions on the use of storyboardthat technology. The effectiveness of the intervention and PjBL and digital technology was evaluated based on changes in knowledge and attitudes, as well as participants' responses on the use of the flatform. Thus, it will provide deep insight into the impact of PjBL integrated with digital technology in English language learning and participants' perceptions on its use.

Participants Perception after using the Platform

The second research question relates to the participants perceptions of using digital-based technology on the storyboardthat platform for English language learning. Analyzing the results showed the level of agreement in the two categories, namely aspects of using the storyboardthat platform and

usefulness in the learning process. Table 7. shows students perceptions, depicting high agreement that the appearance of storyboardthat is complete (percentage value 83.3) and easy to understand (percentage value 88.9). Additionally, the participants stated that the instructions for using storyboardthat were clear (percentage value 100), and the navigation buttons functional (percentage value 88.9). In respect to performance, the storyboardthat was stable (percentage value 100) and easy to use (percentage value 94.5). It was reported that the average participant had the most influential opinion regarding the aspect of using the storyboardthat platform for learning.

Table 7. Storyboardthat Flatlorm Usage Aspect

Item	N	Percentage	Interpretation
The menu on the storyboardthat display is complete	35	83.3	Most influence
The menu presented on the storyboard is easy to understand	35	88.9	Most influence
The instructions for using the storyboard are clearly conveyed	35	100	Most influence
Navigation buttons using storyboardthat work well	35	88.9	Most influence
The use of storyboard is not slow (stable)	35	100	Most influence
Storyboardthat learning media is easy to use	35	94.4	Most influence

Table 8, shows the perceived usefulness of using storyboardthat as a learning medium. The participants found storyboardthat interesting (percentage value 100) and fun (percentage value 94.4). In addition, the participants expressed significant interest in learning using the platform (percentage value 88.9), including increased enthusiasm (percentage value 94.4) and creativity (percentage value). It was reported that the average participant had the most influential opinion on the aspect of usefulness in using the storyboard platform in learning.

Table 8. Aspects of Storyboardthat's usefulness in learning

Item	N	Mean	Interpretation
Storyboard platform learning media that attracts users	35	100	Most influence
Storyboardthat learning media is very fun	35	94.4	Most influence
Storyboardthat learning media is interested to be studied again at home	35	88.9	Most influence
Storyboard learning media that increases the enthusiasm for learning, especially writing English	35	94.4	Most influence
Platform storyboard that increases creativity	35	100	Most influence

Discussion of Research Results

The development of this model was based on the importance of improving English writing skills for nursing participants. Efforts to improve participant learning were expected to enhance competence and effectiveness in health colleges. The results of the limited trial using this model provided N-gain competence in the medium category, and a similar outcome in the integration model trial. This depicts the need for increased effectiveness of improving competence in the medium category. Efforts to refine the results of the limited trial, produced improved learning outcomes. Meanwhile, the attitude aspect was categorized as low and moderate in the limited and integration model trials, respectively.

Collaborative learning uses camera phones, and editing tools, to share, analyze, and synthesize classroom experiences for the participants (Peramunugamage et al., 2023). The integration of digital tools with the development of productive language medium through active methods (collaborative, project, and problem-based learning), ensures the parallel improvement of language and digital skills. The engagement of students with technology shows that the PjBL approach is interesting, unique, realistic and feasible (Roy, 2017).

The use of storyboardthat platform has helped the students to become more creative (Wahjuningsih et al., 2020). The countless benefits imply that the application of this platform has a huge impact on contemporary education. When combined with writing skills exercises, it provides

several benefits. This was stated in the research by Soto Déniz (2022), on the use of three widely recognized digital platforms (Storyboardthat, Telegram, and Edmodo) to improve the writing skills of students of English as a Foreign Language. Storyboardthat is one of the digital platforms that can be used by both teachers and students to express thoughts or feelings about certain situations through comics, thereby instilling confidence in students. The students are not confident enough when asked to speak in front of peers, despite being good at the material. Some often feel nervous, because it is believed that the audience might find mistakes, leading to embarrassment. Miranthy E.Awulle (2016), stated that storyboards play a significant role in designing concept art at the pre-production stage, to ensure visually appealing images. Figure 2 shows the works of participants on the storyboardthat platform.

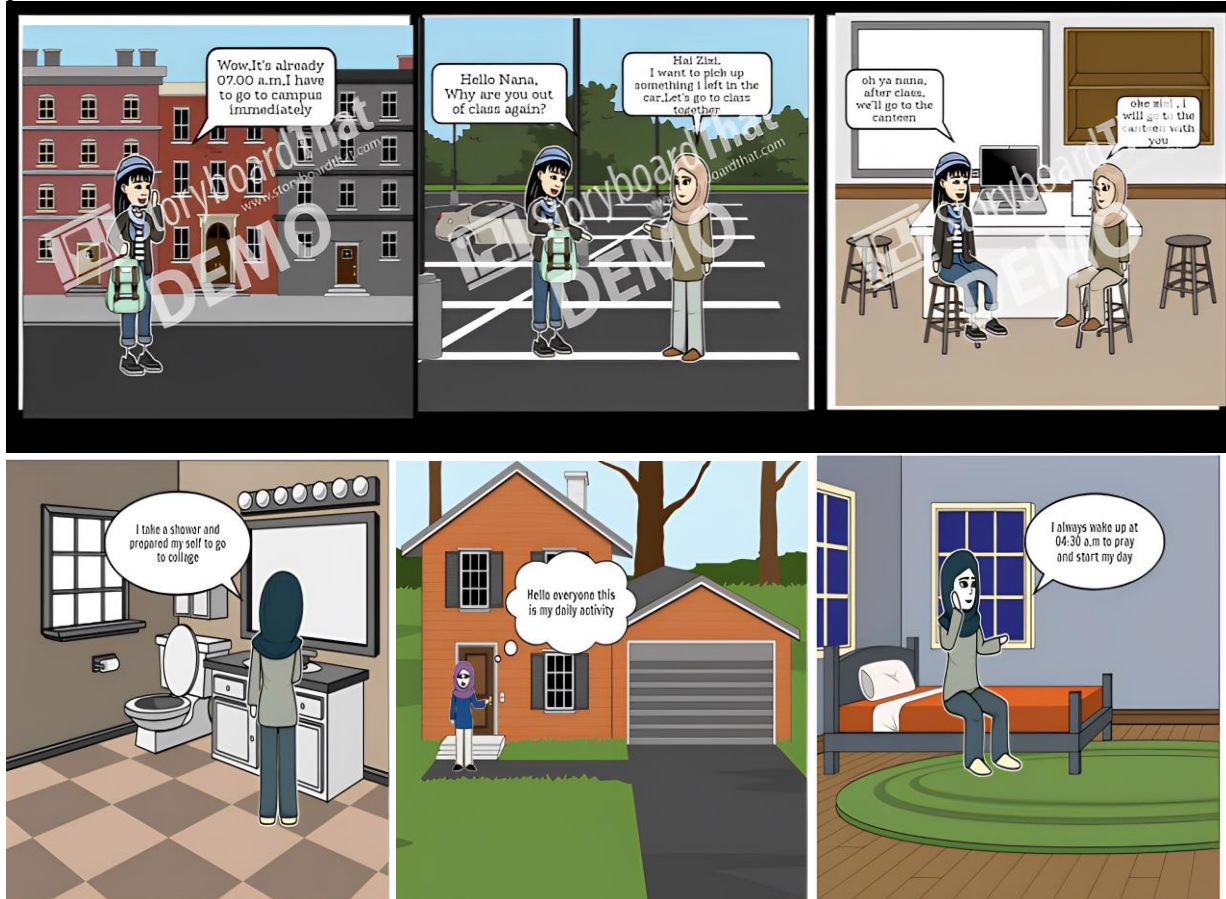


Figure 2. Display of Storyboardthat Creation by Participants

The results of the pilot test stated that there is need for further development, as proven by the medium category. This depicts the need for increasing the use of the storyboardthat platform to improve the knowledge competence and learning creativity of participants, especially in addressing less effective learning interpretations.

The implication of the results of this study is the importance of digital technology integration with PjBL in improving English writing skills (Zhang & Wang, 2023). By using platforms such as storyboardthat, students can enhance their creativity in writing and improve their overall English skills. However, more research is needed to understand more deeply the impact of using these technologies in the context of English language learning (Koleini et al., 2024), as well as to identify the most effective strategies in integrating technology with problem-based project learning methods. Limitations of this study include the limited trials conducted and the focus on one technology platform only. Future research could expand the scope of the trial and compare the effectiveness of different technology platforms. Recommendations for future research include further development of the model used, increased training for teachers in integrating technology in learning, and further research to understand the long-term impact of digital technology integration in English language learning.

CONCLUSION

The integration of digital technology with project-based learning (PjBL) through application platforms such as storyboard that has great potential in improving students' English writing skills. One of the new concepts that can be generated from the results of this research is the concept of project-based learning integrated with digital technology as an effective approach in improving English writing skills. In this concept, digital technology such as laptops and mobile devices are used as access tools for theoretical content and simulation materials through storyboard that platform. Learning is real-time and project-based, with laptops as independent access points for learning resources, evaluation tools, and practical learning phases. In addition, a new concept that can be generated is the importance of strengthening knowledge and attitude aspects simultaneously in English language learning. Through the project-based learning syntax model, learners can improve their understanding of the material as well as their attitude towards learning. The use of digital technology also allows the learners to be engaged, monitored, guided, and evaluated directly by the lecturer, enhancing positive responses and creativity in the use of digital technology in learning. Thus, the results of this study contribute new understanding of how the integration of digital technology with project-based learning can improve students' English writing skills. These concepts can serve as a foundation for further development in the field of education, with an emphasis on using technology as a tool to enhance student learning and engagement.

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AUTHOR CONTRIBUTIONS

For research articles with several authors, Conceptualization, N.Y.S.; Methodology, N.Y.S.; Validation, S.R. and T.R.; Formal Analysis, S.R.; Investigation, T.R.; Writing – Original Draft Preparation, N.Y.S.; Writing – Review & Editing, N.Y.S.; Project Administration, T.R.; Funding Acquisition, S.R.; T.R. and H.R.”.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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