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Enhancing the tenth graders' self-efficacy in learning Social Studies through technology-based pedagogies

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Abstract

This research aimed to improve students' self-efficacy in Social Studies using technology-based pedagogies. The study utilized mixed methods sequential explanatory design which involves quantitative and qualitative data. Pre- and post-assessments were used to measure the development of students' test scores and supported by pre- and post-self-efficacy surveys to identify the changes in students' levels of self-efficacy. The Wilcoxon signed-rank test was used to determine the significant difference in pre- and post-self-efficacy survey scores. At the same time *a paired sample t-test was used to analyze the pre- and post-assessment scores. On the other hand, the data obtained from the interview on the students' experiences was analyzed thematically using Colaizzi's descriptive phenomenological data analysis technique. Results showed that students' self-efficacy in learning Social Studies has improved with increased student engagement, active participation, and a more vibrant learning environment while implementing the interventions. Furthermore, the study recommends that teachers integrate different technological tools in their classes to enhance students' self-efficacy.*

Keywords: *self-efficacy; technology-based pedagogies; Social Studies*

INTRODUCTION

Bandura (1977) introduced the idea of self-efficacy, which refers to the belief that an individual holds the ability to perform a specific task successfully. A study by Hermita and Thamrin (2015) found that the higher academic self-efficacy students have, the higher their metacognitive awareness.

This concept of self-efficacy is crucial in the context of Social Studies education. According to the National Council for Social Studies (1992), Social Studies is a vital subject in the school curriculum as it helps students develop crucial skills such as critical thinking, civic engagement, and cultural awareness. However, most students still perceive Social Studies classes as uninteresting, dull, and insignificant to their lives (Mensah, 2020). In the same study by Mensah (2020), the findings suggest that teachers do not exhibit an interest in teaching contemporary and controversial issues, fail to provide necessary instruction to assist students, are unable to integrate varied instructional materials, and insufficient

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teaching materials are the major factors as to why it affects student's attitude towards Social Studies.

To address these challenges, the Department of Education (DepEd) No. 78, s. 2010, also known as the "Guidelines on the Implementation of the DepEd Computerization," is a policy aimed at transforming the Philippines' education system that emphasizes the importance of improved essential education services through improved quality teaching and learning through ICT integration in classroom instruction. DCP aims to provide public schools with appropriate technologies that would enhance the teaching-learning process and meet the challenges of the 21st century. This initiative is in line with TPACK (Technological Pedagogical Content Knowledge), a new framework for integrating technology that helps teachers evaluate and enhance their teaching practices (Harris & Koehler, 2009).

Technology is essential to Education in the global digital age (Farısı, 2016). Kunter et. al. (2013) asserted the importance of teachers' professional competence in improving instructional quality and student development, and the findings suggest that teachers with higher levels of competence were positively associated with student achievement. Technology in Education has been used to develop the students' abilities to think critically, solve problems collaboratively, and act conscientiously in addressing complex issues to benefit their futures and the greater good of the global society (Green et al., 2014). However, researchers found in their field study that Grade 10 students of Bunga National High School were not actively engaged, which constitutes low interest and low self-efficacy in the teaching and learning processes, specifically in the field of Social Studies. In a class of 30 students, only 14 passed the term. Having this, an intervention must be made in order to enhance student's self-efficacy applying technology-based pedagogies. Specifically, this study aims to answer the following questions:

1. Are technology-based pedagogies effective to enhance the tenth graders self-effacement in learning Social Studies?
2. Is there a significant difference between the student's self-efficacy before and after the application of technology-based pedagogies?
3. What are the students' learning experiences regarding the use of technology-based pedagogies in the classroom?

METHOD

This study used a sequential explanatory research design in which qualitative and quantitative data were collected. Student consent was provided before the intervention for ethical consideration. Class observations and interviews were conducted to gather the qualitative data. Researchers used structured questionnaires for the interview to ask the students about their perceptions and experiences in using technology-based pedagogies. Simple random sampling was used to select the participants for the interview.

Moreover, to collect the quantitative data, an assessment and survey were conducted before and after the intervention. The pre-and post-assessments consist of 30-item questions containing the lessons discussed in the Social Studies during the four-week implementation of technology-based pedagogies. In addition, the researchers used a modified questionnaire for the pre-and post-self-efficacy surveys (Higgins & Kotrlik, 2006).

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Respondents

The participants of this study were the Grade-10 Matibay students of Bunga National High School which are composed of 18 males and 20 females in the Academic Year 2023-2024.

Data analysis plan

Different statistical tools were used to analyze this study's qualitative and quantitative data. The qualitative data obtained from the interview and observation were analyzed using Colaizzi's descriptive phenomenological technique of data analysis. Its unique seven-step procedure was applied to extract meaningful statements from the verbatim transcription and derive their meanings (Praveena, 2022).

The paired sample t-test, or the dependent sample t-test, was used to analyze the quantitative data from the pre- and post-assessment. Expanding on the idea of using the paired sample t-test or dependent sample t-test for data analysis, the National University identifies this as statistical. The method is particularly useful in research studies where the same participants were measured or tested at two different time points or under two different conditions. By comparing the means of the related groups, researchers gained valuable insights into the potential changes within the same sample. Moreover, the researchers used a non-parametric test to compare the results and record significant differences between the pre-and post-self-efficacy surveys. The Wilcoxon test is a non-parametric statistical test that compares two paired groups. It is also known as the signed-rank test variant or the rank sum test. The tests determine if sets of pairs differ statistically substantially by calculating and analyzing these differences (Hayes, 2023).

The data gathered from the Self-Efficacy survey results were tabulated by adding the scores on a specific indicator and dividing by the total number of items to obtain the mean, which was then assessed accordingly. The levels of self-efficacy were categorized as follows: a mean score between 5.00 and 4.50 indicates Very High Self-Efficacy, 4.49 to 3.50 indicates High Self-Efficacy, 3.49 to 2.50 indicates Average Self-Efficacy, 2.49 to 1.50 indicates Low Self-Efficacy, and 1.49 to 0.50 indicates Very Low Self-Efficacy (Higgins & Kotrlik, 2006).

Research intervention and procedure

Pedagogies of school reform are now highly influenced by and built around “constructivist” theories of learning that assume the use of technology in Education (Windschitl, 2002). With that, educational technologies, specifically computer and internet technologies, have inevitably become influential in the classroom as they change how we teach and learn (Ayas, 2006). Recent developments have created opportunities for influential social studies teaching assisted by technology. For example, computers are much more powerful and versatile today than a decade ago. Therefore, by integrating technology with the proper hardware and software, teachers can develop lessons that enhance student skills in information retrieval, data presentation, comparing and evaluating different perspectives, and critical reflection and decision-making (Ayas, 2006). However, as researchers have observed, technology integration in the teaching and learning processes has yet to be fully utilized. Thus, this study used four technological tools: Microsoft PowerPoint, WebQuests, Online Student Response System (Mentimeter & Kahoot), and Google Classroom.

PowerPoint, part of the Information and Communications Technology (ICT) program developed by Microsoft in 1987, is a presentation application bundled in Microsoft Office that allows users to create slide-based presentations (Asogwa & Echemazu, 2011). In educational settings, PowerPoint enhances teaching by combining a computer and projector to display slides, providing a structured way to communicate information,

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reinforce key points, and incorporate multimedia elements to support various learning styles.

The WebQuest model was developed in 1995 by two San Diego State University professors, Tom March, and Bernie Dodge, to engage the learner in a task that elicits higher-order thinking rather than simple information searching and recall (Sandars, 2005). In social studies education, WebQuests allow students to actively engage in learning by connecting their interests with various content areas.

Online student response systems (OSRS) are fast replacing classroom response systems (CRS), also known as personal or audience response systems or "clickers." OSRS can more easily be implemented in the classroom because it is web-based and allows students to use any browser and device to do the "clicking" required to participate. In this study, we will integrate two (2) Online Student Response Systems, namely Mentimeter and Kahoot!

Mentimeter is a user-friendly, web-based Audience Response System (ARS) that engages students in active learning through features like multiple-choice questions (MCQs). It allows teachers to instantly assess students' understanding using interactive questions, with over 8 million users currently utilizing the platform. On the other hand, Kahoot!, as described by Wang (2015), is a game-based student response system (GSRS) that transforms the classroom into a game show, with the teacher as the host and students as contenders. The platform features easy-to-create quizzes, anonymous participation, and instant assessment, allowing students to compete, have fun, and learn without registering.

Google Classroom is part of the online Google Apps for Education (GAFE), a suite of packed productivity applications for teachers and students in learning and online collaboration that provides a central site for communicating with students, sending feedback, and giving homework. The effectiveness of Google classroom-based blended learning in improving students' self-efficacy is also supported by previous research, which revealed that Google Classroom is an interactive medium that increases learning activities so that the estuary stimulates the mental growth of students' learning (Sulisworo et al., 2020; Warman, 2021).

The said technological tools were implemented and served as a scaffold in the teaching processes of Social Studies. The following was the overall structure of this study's technology-based pedagogies.

Table 1. Procedural framework of the four-week intervention of technology-based pedagogies

Steps	Process
1	Pre- and post-self-efficacy surveys was conducted using a standardized questionnaire to assess students' self-efficacy before and after the intervention.
2	Researchers integrated four technological tools to Grade 10 Matibay class. A particular technology-based pedagogy was implemented each week. • **Week 1 - Microsoft PowerPoint** Used to create interactive lesson plans, with visuals, videos, and quizzes. • **Week 2 – Webquest** Used for collaborative learning. Students used their mobile phones to access the web and outputs produced were submitted via google classroom. • **Week 3- Mentimeter and Kahoot!** Online quizzes on mobile phones to assess understanding of topics like Disaster Prevention and Response. • **Week 4 -Google Classroom** Platform for submitting assignments and accessing learning materials throughout the intervention.

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3	An interview was conducted to Grade 10 students about their learning experiences with the use of technological tools and how technology-based pedagogies affect their self-efficacy in learning social studies.

RESULTS AND DISCUSSION

The findings are discussed through quantitative and qualitative data using figures and tables to represent the self-efficacy and the effectiveness of technology-based pedagogies before and after integrating technology-based pedagogies.

RQ1: Are technology-based pedagogies effective to enhance the tenth graders' self-effacement in learning Social Studies?

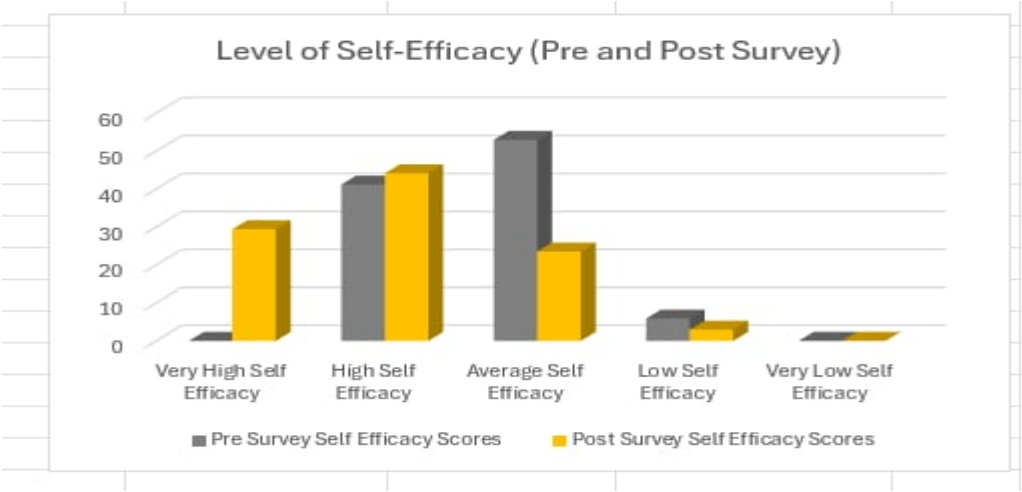

Figure 1. Pre and Post Self-Efficacy Survey Results

Figure 1 shows that 52.94% of the total population has an “Average Self-Efficacy” in learning the subject matter. On the other hand, none of the students perceived themselves to have “Very Low Self-Efficacy” or “Very High Self-Efficacy" before the intervention was implemented. This means that students' self-efficacy needs to be improved. "High Self-Efficacy" was perceived by 41.18% of the participants, who positively viewed the subject. These results signify that some students are less motivated to learn Social Studies concepts. Demirören et al. (2016) stated that students with perceived low self-efficacy see learning challenges as a hindrance to learning, while students with perceived high self-efficacy see those challenges as a motivation to grow and develop. The post self-efficacy survey results however, showed a "High Self-Efficacy" at 44.12% followed by "Very High Self-Efficacy" at 29.41%. This data explains significant changes in the participants' perceived self-efficacy in learning social studies. A decreasing percentage was also seen from the participants, with "Average Self-Efficacy" comprising 23.53% and "Low Self-Efficacy" perceived by 2.93% of the students. These changes are attributed to the integration of technology-based pedagogies.

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RQ2: Is there a significant difference between the student's self-efficacy before and after the application of technology-based pedagogies?

The graph in Figure 2 shows significant differences between the pre-and post-self-efficacy survey results before and after integrating technology-based pedagogies in learning Social Studies. The researchers conducted a pretest before implementing the intervention, and only four students got a 60% passing rate. After the implementation, a post-test was conducted, from which thirty-one students reached a 60% passing rate. The student's pretest and post-test scores have become noticeable as they have increased self-efficacy in learning social studies. Positive influences are caused by higher self-efficacy toward better performance of the students' test scores.

On the other hand, the researchers used the paired sample t-test to determine the effect of the intervention implemented with the given data: p= 2.2e-16, df (37). Moreover, the 95% confidence interval for the mean difference is (9.2525, 10.4317). The mean difference between the scores for the pre-and-post group is 9.84. Since the p-value is less than the significance level of 0.05, the researchers reject the null hypothesis that the two groups are statistically significant. Thus, this means that integrating technology-based pedagogies substantially affected the students' test scores in learning Social Studies

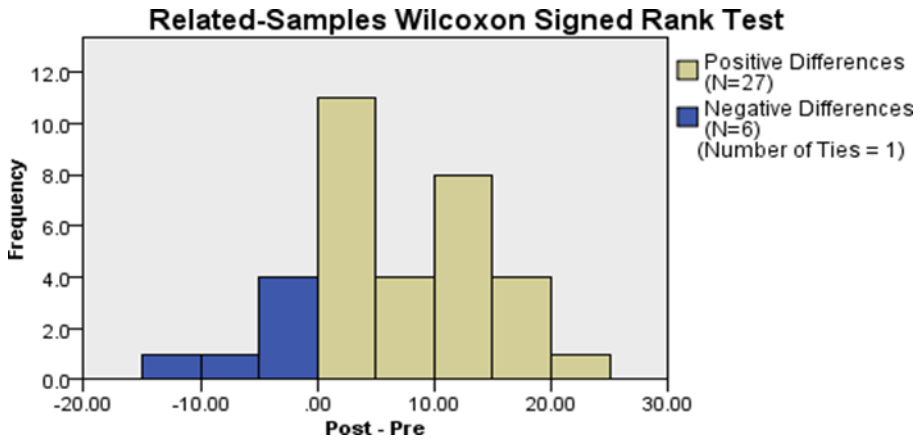

Figure 2. Wilcoxon Signed Ranks Test of Pre and Post-Self-Efficacy Survey

Figure 2 shows significant changes in integrating technology-based pedagogies in learning Social Studies through the Wilcoxon signed ranks test. Positive differences were recorded, and a large proportion of the study participants were included. This means that within the implementation of the intervention, the majority of the participant's self-efficacy level increased. The data supports the idea that effective classroom innovation depends on student-centered practices as students become more participative with the use of technology-based tools (Ertmer & Ottenbreit-Leftwich, 2010). This result has also been supported with z= -3.738556, p= 0.000185. An increased mean score of the post-group compared (39.09) to the pre-group (32.91) has also been recorded, which means that the participants' self-efficacy is improved using technology-based pedagogies.

On the other hand, less variability of scores between the post-group (6.726) and the pre-group (4.932) means that improved self-efficacy using the intervention is evident among the sample data. A paired sample t-test was also applied to predict the intervention's effect on the participants' self-efficacy level. With *df* (33), *p*= 0.0004667, which means less

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than our significance level of 0.05, we reject the null hypothesis. In other words, we have sufficient evidence that the mean scores between the pre- and post-groups are statistically and significantly different. This means the intervention had a significant effect on improving students' self-efficacy in learning Social Studies. In addition, our 95% confidence interval says that we are "95% confident" that the actual mean difference between the two groups is between 3.493681 and 8.859260.

RQ3: What are the students' learning experiences regarding the use of technology-based pedagogies in the classroom?

Recent studies have examined the impact of technology-based pedagogies on student learning experiences in the classroom. These findings provide valuable learning experiences for Grade 10 - Matibay students in integrating technology-based pedagogies

Table 2. Perceptions of respondents on the use of technology

Themes	Codes	Statements
Initial Impressions Toward Technology	Eagerness to Learn	"Naexcite ko sa pagkahibalo nga nay technology na i-integrate sa among klase". I was excited about knowing that technological tools would be integrated into our class. - G10 -S1, S7, S13 "Bag-o siya sa akoa nga murag maka motivate nga mo participate ko sa klase". It was like hearing about a new strategy to motivate me to participate in class. - G10 - S15,S9
	Lack of technological know-how	"Kulba basin dili ko kabalo unsaon paggamit". I was nervous that I might not know how to use it. - G10 - S4 "Nag imagine ko, murag lisud siya gamiton". It sounded difficult for me as I tried to imagine myself using it. - G10 - S12.

The researchers considered the initial thoughts and feelings of the students before the intervention to determine their changes and development after integrating technology-based pedagogies. According to recent research, self-control, motivation, and cognitive functions essential for academic performance are connected to feelings of achievement (Camacho-Morles et al., 2021). Based on the findings, a group of students said they were excited to hear about using technological tools in social studies. They were excited because they reasoned that they will discover different technological applications and a new learning strategy. "*I was excited to know that technological tools will be integrated into our class,*" Student 1 shared. Another student shared the same feelings as they treated it as a motivating facin learning. As one of the students said, "*It was like hearing about a new strategy to motivate me to participate in class*" (S15).

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Table 3. Hands-on learning experiences

Theme	Codes	Statements
Positive outcomes and setbacks	Stimulates learning interest	"Aligre kayo ang klase sukad nakasuway mi nga pwede day ipaagi ug games ang amoa quiz." It was exciting since our quiz was incorporated with a game-based strategy. - G10 - S6 "Tungod kay curious ko unsa na ang PPT,webquest,menti/Kahoot, ug google classroom, naganahan ko paminaw sa akong teachers unya naka focus ko sa tanan discussion." Because of my great interest and curiosity with the tools used, it drew my attention and made me focus on listening to the class Discussion -S1. "Sauna, laayan kaayo ko basta mag klase na ug Araling Panlipunan. Pero pagsugod ug introduce ni teacher sa mga technological tools nga mura ra mi ug nagduwa sa klase, mas naminaw og focus nako sa amo discussion." I got bored listening to Araling Panlipunan class. However, using these fun and interactive technological tools made me more focused on listening to the class discussion -S7. "Memorable jud tanan nga mga tools na amoa gi gamit every week. Every week, lain-lain amoa nahibaw-an, ug importante pud ni para makahibaw na naa diay lain ways unsaon para aligre ang klase." Everything was memorable for me as I learned many new things every week. We were introduced to different skills in using such tools. This give us new knowledge that certain apps could make class discussion enjoyable and motivating to learn -S3.
	Difficulty in using the tools	"Napressure ko pagkakita na hapit na ang deadline sa amo output sa Google Classroom. Pag submit nako, wala ko kahibaw na kailangan pa diay i turn in para ma submit ang ako output. Pagka submission date na nako nahibaw-an nga wala diay ma submit. Mao to, na late nako pag pass sa ako output and gi make sure najud nako na pisliton ang turn in para ma submit jud akoa gi trabaho." I felt pressured when the deadline for the Google Classroom was near. So, I submitted my output, but I did not know that I must turn it in to be finally submitted to the teacher. I just learned about it past the deadline. As a result, I turned in late and gave a lesson to turn it in to make sure I submitted my work. - S12.

The table explains that experiential learning through technology-based pedagogies enables students to be enthusiastic about learning Social Studies. The recurring theme across these statements is a positive transformation in students' attitudes, engagement, and focus during the learning process. The game-based approach has proven effective in capturing students' interest and making their educational journey more interactive. These tools enhance students' curiosity and interest, leading to heightened focus during class discussions. This implies the importance of using technology to create a stimulating learning environment that reflects learners' interests.

Additionally, incorporating technological tools has successfully turned what was once perceived as a boring class into an engaging and enjoyable learning experience. The diversity of the technology-based pedagogies introduced keeps the learning experience fresh and showcases the importance of providing varied instruction to keep students engaged. It enhances students' participation by linking collaborative and project works that stimulate learning interest (Mdhlalose & Mlambo, 2023). Recognizing alternative ways to excite the class contributes to a positive and memorable learning atmosphere.

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On the other hand, some students experienced pressure as the deadline approached on Google Classroom, revealing the time-sensitive nature of online assignments. Unfortunately, the student misunderstood the submission process and was unaware of the necessity of submitting the output and officially turning it in. This resulted in a late submission, emphasizing the natural consequences of oversight in online assignment procedures. However, the student recognized the experience as a valuable lesson, emphasizing the importance of correctly submitting assignments for timely submission. The incident highlights the importance of students becoming familiar with the functionalities of online learning platforms. It also suggests a broader issue of digital literacy, prompting the consideration of additional guidance, such as tutorials or orientation sessions, to enhance students' understanding of the tools available to them. Due to these unforeseen circumstances, the researchers have agreed to provide a Google Classroom simulation for the class. Researchers provided opportunities for video tutorials and a workshop on effectively using the tool. Ultimately, this experience contributes to the student's development of digital literacy and highlights the significance of adequate familiarity in any virtual learning environment

Summary
The intervention significantly improved students' self-efficacy, with a significant change from lower to higher self-efficacy levels in learning Social Studies. The pre-survey self-efficacy survey revealed that 52.94% or over half of the participants had an "Average Self-Efficacy," indicating a neutral viewpoint in learning Social Studies. Post-survey results significantly improved, with 44.12% "High Self-Efficacy." Students reported engaging learning experiences that positively influenced their academic performance, evidenced in their improved post-test scores and better understanding of the social studies concepts. Observation and interviews revealed increased student engagement, active participation, and a more vibrant learning environment while implementing the different interventions.

CONCLUSION

The researchers found that integrating technological tools in the class significantly enhances their self-efficacy. Students became more active and participative in-class activities and were motivated to learn more. PowerPoint presentations, webquest, Kahoot!, mentimeter, and google classroom influence students' understanding of the subject, thus improving their self-efficacy. Based on the findings and the conclusion of the study, the researchers recommend the use of technology-based pedagogies in enhancing student's self-efficacy. There is also a need to house digital resources, lesson plans, and video tutorials for easy and efficient access of educators, and lastly it is encouraged to conduct studies of different technological tools, especially those that do not need an internet connection.

AUTHOR CONTRIBUTION

Author 1: Conceptualization; **Author 2**: Methodology; **Author 3**: Writing and editing the data; **Author 4:** Data analysis; **Author 5**: Thematic analysis; **Author 6**: Reviewing and supervision

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