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The influence of cooperative learning strategy on social studies pre-service teachers' attitudes towards cybercrime prevention

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Abstract

This study investigates the influence of cooperative learning strategy on Social Studies pre-service teachers' attitudes toward cybercrime prevention. The study employed a quasi-experimental research design of the pre-test, post-test, and control group design. The population comprised pre-service teachers enrolled in Social Studies education departments across three universities in the Southwest region of Nigeria. A multistage sampling procedure was employed, selecting intact classes from each university. The research utilized a comprehensive set of instruments, including the Cooperative Learning Strategy Guide and Lecture Note (CLSG), Conventional Method Guide and Lecture Note (CMG), and Attitude to Cybercrime Prevention Scale (ACPS). Data analysis was conducted using descriptive and inferential statistics. All Hypotheses were tested at a significance level of 0.05. The findings showed that using cooperative learning strategies positively affects Social Studies pre-service teachers' attitudes toward cybercrime prevention. This approach encourages active engagement, collaboration, group discussions, problem-solving, and sharing learning experiences. These results revealed the necessity for tailored approaches to address attitude change effectively. Integrating cooperative learning strategies into higher education can help pre-service teachers take a proactive approach to cybercrime prevention. This will improve their knowledge and skills while promoting a safer digital learning environment for students.

Keywords: cooperative learning strategy, pre-service, teachers, attitude, cybercrime and social studies

INTRODUCTION

The prevalence of cybercrime, particularly via the Internet, seems to increase as computers have become essential for government, entertainment, and business (Dennis, 2019). Cybercrime is known as computer crime, as the use of a computer to further illegal activities, such as fraud, identity theft, the trafficking of child pornography and intellectual property, and privacy violations (Dennis, 2019). Saroha, (2014) reported that 20th century saw the revolutionary invention of the internet Saroha went further to say that bringing people and nations closer together through improved communication and quick exchange of ideas and information will effectively shrink the world into a much smaller place. Apart from the benefits of the internet, there is rise in the number of security issues that have been discussed at the highest levels of official and governmental discourse. These crimes seem to endanger the financial stability and security of a country. Tanwar (2016) opined that globally, these concerns related to these kinds of crimes are now high-profile cases.

Although people of various ages seem to commit cybercrimes, in most recent cases, the younger generation seems to be the guiltiest. According to 2016 research by Akpan, cybercrime has driven Nigerian students to pursue financial gain over their actual goal of attending college. Since many people can now afford the tools needed to hack in today's environment, many young people appear to be involved in cybercrime with the intention of becoming the best hackers or as a business endeavor. The rate at which young people in Nigeria are participating in cybercrime, according to Ngozi (2016), is cause for immediate alarm.

The cyber threat in the United Kingdom (UK) remains a tier-one national security threat, as cybercrime is a worldwide phenomenon that happens everywhere (Calum, 2014). According to Calum (2014), unauthorized internet use is one of the three primary threats to UK cyber security.There is a greater likelihood that people may utilize the internet for illegal activities due to rising internet usage and accessibility as well as the rising amount of public and private assets held online rather than in physical places. According to Javelin Strategy and Research (2009), there are roughly 1.8 billion internet users. Due to increased internet usage and technological advancements, hackers now have additional targets to attack in addition to new, lucrative opportunities (Lance, 2009). In the words of Longe, Ngwa, Wada, Mbarika, and Kvasny (2009), Ghana, Nigeria, and Cameroon are three of the top ten countries in the world for experiencing cybercrime.

According to Bidgoli, et-al (2016), because of their growing technological proficiency and socioeconomic and financial independence, undergraduate students are particularly vulnerable to cybercrimes. It was also shown that undergraduates heavily depend on the media and people in their social circles for information regarding cybercrime and cyber-security. What was needed to report cybercrime was not known by the majority of undergraduates. Bidgoli, et al. (2016) state that affiliation and proximity in the fraud world are often determined by the categorization of undergraduates who are mostly engaged in cyber fraud based on their age, sex, caste, social level, and a host of other factors. The main causes of cybercrime among college freshmen are the pervasive poverty and high levels of corruption. According to Akpan (2016), since hacking tools are now so widely available, students are actively looking for money to become the best hackers or to launch successful enterprises. Majority of Nigerian students make less than $1, or 360 naira, every day. Over 5 million undergraduates from Nigerian universities resort to cybercrime as a means of paving the path for the future. After leaving the school, they don't know what they want to do (Igba, et-al, 2018).

Nigeria experiences diverse range of cyber threats following her growing digital economy and great internet usage among the people. Ngozi (2016), stated that Nigeria as a country has experienced several cases of financial fraud, data breaches, social media abuse, and cyber-attacks by targeting critical infrastructure and suspected victims. Also, Ngozi (2016) stated that the impact of cybercrime has extended beyond financial challenges to include damage of reputation, loss of integrity, and national security concerns. The government of the federal republic of Nigeria has taken several actions so as to address cybercrime through legislative and regulatory steps. The Cybercrimes Act of 2015 criminalizes various cyber offenses, including unauthorized access to computer, electronic fraud, identity theft, cyber-bullying and cyber-terrorism. In addition, the National Information Technology Development Agency (NITDA) and the Nigerian Communications Commission (NCC) play significant roles in regulating cyber-security and promoting awareness about cybercrime (NITDA, 2019).

Cybercrime prevention involves a comprehensive strategy integrating advanced technological measures, robust legal frameworks, and public awareness initiatives. Technological measures include implementing firewalls, encryption, and intrusion detection systems to protect against unauthorized access and data breaches (Goodman, 2015). Robust legal frameworks are essential to address the ever-evolving nature of cyber threats, with international cooperation playing a critical role in combating cybercrime across borders (Clough, 2015). Public awareness campaigns and regular training sessions educate individuals and employees on recognizing and responding to cyber threats, promoting good cybersecurity practices (Anderson &Agarwal, 2010). Additionally, collaboration between government agencies, private sector organizations, and international bodies enhances information sharing and coordinated responses to cyber threats (Kshetri, 2013). By integrating these elements, cybercrime prevention efforts can effectively mitigate risks and enhance digital security.

Effective cybercrime prevention will require cooperation between government agencies, law enforcement agencies, businesses in the private sector, academic institutions, and civil society organizations. Partnerships like the Cybercrime Advisory Council and the Cyber Security Experts Association of Nigeria (CSEAN) do enable the exchange of information, develop capacity, and respond to cyber threats in a coordinated manner an public-private partnerships foster a cyber-security culture across sectors and improve cyber resilience (Adanma, 2017).Public education and cyber-security awareness initiatives would be critical in preparing individuals and organizations to withstand assaults. Government agencies, non-governmental organizations (NGOs), and cyber-security corporations undertake awareness campaigns, seminars, and training sessions to encourage safe online behavior, digital literacy, and threat intelligence sharing and on common cyber hazards, phishing assaults, password security, and social engineering tactics is critical for combating cybercrime (Aladenusi, 2020). According to Haseeski, (2020), firewalls, antivirus software, intrusion detection systems (IDS), encryption tools, and secure authentication procedures are examples of technological solutions that may be used to increase cybersecurity. Businesses invest in cyber-security solutions to efficiently detect, prevent, and eradicate online threats and, vulnerability assessments, incident response plans, and continuous monitoring are critical components of cyber-security strategy.

According to Odo and Odo (2015), cybercrime is an increasing global threat most especially in Nigeria where technological developments have resulted in greater online activity and pre-service teachers, as future educators, need to play important roles in raising cyber-security awareness and combating cybercrime among pupils and pre-service teachers frequently display a high understanding of the prevalence of cybercrime in Nigeria. Benzer and Karal, (2023) conducted a poll of pre-service teachers from several educational institutions in Nigeria, and majority of them expressed serious worry about the rising rates of cybercrime against individuals, corporations, and government agencies. Benzer and Karal, (2023) also stated that increased awareness emanate from teachers' personal encounters with online risks, as well as the rising emphasis on digital literacy and cyber-security in educational curriculum. Despite the challenges posed by cybercrimes, some pre-service teachers exhibit a sense of technological optimism regarding cybercrime prevention, they believe in the potential of technological advancements and robust cybersecurity measures to mitigate cyber threats effectively (Willie, 2023).

This optimism aligns with the views expressed by Idris, et al. (2023), who argue that embracing innovative technologies such as artificial intelligence (AI) and blockchain can significantly enhance Nigeria's cyber resilience framework and on the other hand, a significant portion of pre-service teachers adopts a risk-averse approach to cybercrime prevention. They emphasize the importance of implementing stringent cyber-security protocols, data encryption techniques, and privacy protection measures (Karagozlu, 2020). This cautious attitude reflects broader concerns within the Nigerian educational community regarding the vulnerabilities associated with digital platforms and the need for proactive risk management strategies (Amini-Philips, 2018). On the other hand, there exists a cohort of pre-service teachers who harbour skepticism and distrust toward current cybercrime prevention measures in Nigeria. They point to systemic issues such as weak law enforcement, inadequate regulatory frameworks, and limited resources allocated to cyber-security initiatives (Ogbeide, et al. 2023).

This skepticism calls for the urgency of addressing institutional gaps and fostering greater collaboration between teachers' and the law enforcement agencies to prevent cybercrime in Ekiti State and the Nigeria at large, Bringing about attitudinal change among the ore-service teachers through exposing them to the prevention of cybercrime using innovative strategy such as cooperative learning strategy may be pertinent the war against the crime.

In the opinion of Tew (2019), cooperative learning is an instructional approach that encourages learners to work together in small groups to achieve common learning goals, it promotes active participation, collaboration, and critical thinking skills among learners, making it an effective strategy for addressing complex topics such as cybercrime prevention. Pre-service teachers in Nigeria may exhibit varying attitudes toward cybercrime prevention, influenced by factors such as their knowledge of cyber-security, experiences with technology, cultural perceptions, and educational backgrounds. According to Dew (2020), positive attitudes toward cybercrime prevention involve recognizing the importance of digital security, advocating for responsible online behavior,

and implementing preventive measures. Research conducted in Nigeria showed that integrating cooperative learning strategies into cyber-security education for pre-service teachers can positively impact their attitudes toward cybercrime prevention. Aduwa-Ogiegbaen, and Iyamu, (2021) found out in their study that pre-service teachers who participated in cooperative learning activities showed increased awareness of cyber threats and greater confidence in addressing cyber-security issues in educational settings. Educating students about basic cyber hygiene, such as the importance of strong passwords and recognizing phishing attempts, can significantly reduce the risk of cybercrimes. Individuals who are more knowledgeable about cyber threats are less likely to fall victim to them (Hadlington, 2017). According to Whitman, et al. (2019) teachers serve as role models and can significantly influence students' attitudes and behaviors towards cyber-security. Their guidance can instill a sense of responsibility and vigilance in students.

Aduwa-Ogiegbaen, and Iyamu, (2021) also conducted a longitudinal study involving pre-service teachers from Nigerian universities and observed a significant shift in attitudes toward cybercrime prevention after engaging in cooperative learning experiences focused on cyber-security awareness and digital ethics. While cooperative learning can enhance pre-service teachers' attitudes and competencies related to cybercrime prevention, challenges such as limited resources, technological infrastructure, and awareness gaps exist. To address these challenges, it is essential to prioritize cyber-security education in teacher training programs, provide access to relevant resources and training materials, collaborate with cyber-security experts and industry partners, and integrate practical, hands-on activities into the curriculum (Rahman, et al., 2020).Pre-service teachers may play crucial roles in teaching students about cyber-security. However, they may give what they don't have. That is their attitude toward cybercrime will determine the extent to which they will help in the preventing it. Hence, the need to determine their attitude towards the crime prevention using cooperative learning strategy making it necessary to understand how cooperative learning strategies influence their attitudes toward cybercrime prevention. Thus, this study aims to explore how pre-service teachers' views toward cybercrime prevention in Nigeria are influenced by cooperative learning practices.

Collaborative learning is a kind of education in which learners via in small groups or teams through a process of problem solving towards a common goal. This pedagogy, on the other hand, boosts the engagement, involvement in members, and the bonding among them. This promotes proper learning, effective critical thinking and the consequent excellence in academia. Recent research has led to the understanding of why collaborative learning is beneficial and what its effectiveness lies in. For example, the Caponetto, et al. (2020) study tried to establish if cooperative learning is effective in higher education. Findings of this study showed that cooperative learning helped students to go deeper in their learning and improved their ability in solving problems. Also, a meta review done by Springer et al. (2021) showed that collaborative learning positively influences the educational outcomes; they included the increase of subject retention and better on test performance.

Collaborative learning, on the other hand, has proven to be beneficial in that it enhances how students communicate and bring about positive interactions socially. The article of Panadero et al. published in 2020 indicated that there was the need for collaboration and fellow feedback for learners to be facilitated to build themselves and form a supporting learning ecosystem (Panadero et al, 2020).

Apart from facilitating academic development, collaborative learning in our contemporary era has as well become an important platform for developing critical twenty-first century skills like teamwork, communications and cooperation. What is more, the results of a research by Hargreaves and Fullan (2021) relating to the impact of collaborative learning for todays and tomorrow's workplaces as well as helping people establish a culture of lifelong learning cannot be ignored. Hence, this study tends to investigate the influence of cooperative learning strategy on Social Studies pre-service teachers' attitudes towards cybercrime prevention.

Purpose of the Study

The purpose of this study is to investigate the influence of investigate the influence of cooperative learning strategy on Social Studies pre-service teachers' attitudes towards cybercrime prevention.

Research Questions

1. What is the attitude of Social Studies pre-service teachers towards cybercrime prevention before and after exposing them to cooperative learning strategy?
2. What is the mean difference in the attitude of Social Studies pre-service teachers in the treatment and control groups toward cybercrime prevention?

Research Objectives

To achieve the above aim, the following objectives will guide the study:

1. Determine the attitude of Social Studies pre-service teachers towards cybercrime prevention before and after exposing them to cooperative learning strategy.
2. Determine the difference in the attitude of Social Studies pre-service teachers in the treatment and control groups toward cybercrime prevention.

Research Hypotheses

This research hypothesis was tested at 0.05 level of significance:

1. There is no significant difference in the attitude of Social Studies pre-service teachers toward cybercrime prevention before and after exposing them to cooperative learning strategy.
2. There is no significant difference in the attitude of Social Studies pre-service teachers in the experimental and control group towards cybercrime prevention after exposing them to cooperative learning strategy.

LITERATURE REVIEW

Social Learning Theory

Recognizing the importance of equipping pre-service teachers with skills to combat cyber threats, it is crucial to understand the underlying mechanisms that facilitate such learning. This brings the rationale behind using social learning theory as a foundational framework for this study.

This study is grounded in social learning theory, which was introduced by Albert Bandura in 1977. Bandura's theory posits that individuals learn by observing the behaviors, attitudes, and outcomes of others' actions. This concept shows the importance of modeling and vicarious learning in shaping a person's beliefs and behaviors (Bandura, 1977). According to Bandura (1986) emphasized the role of cognitive processes such attention, memory, reproduction, and motivation in facilitating observational learning. In the word of Muro & Jeffrey (2008), Social learning theory is rapidly being seen as an important component of sustainable natural resource management and the promotion of desirable behavioral change. According to Newman and Newman (2007), Bandura in 1977 proved that cognition plays a substantial part in learning, and over the last 30 years, social learning theory has grown increasingly cognitive in its interpretation of human learning.

This theory is pertinent to the study because it posits that Social Studies pre-service teachers may learn about cybercrime prevention by observing experienced instructors and colleagues. For example, witnessing colleagues applying cyber-security measures like as strong passwords, safe internet surfing habits, and educating pupils about online safety may have a good impact on pre-service teachers' views towards cybercrime prevention. If pre-service teachers witness instances of cyber vulnerability or poor responses to cyber threats in educational contexts, they may acquire unfavorable attitudes or feel less motivated to solve cyber-security concerns (Mergler 2012).

These observations can shape their beliefs about the importance of cyber-security measures and their efficacy in mitigating cyber risks in schools. Researchers and teachers can use social learning theory to promote positive attitudes and behaviours related to cyber-security among pre-service teachers (Ayanwale, et al, 2023). Providing opportunities for observational learning, modeling best practices, and creating a culture of cyber resilience can contribute to a safer digital learning environment for students and the society at large.

Collaborative teaching as a concept presents the idea of teachers working together by deciding and implementing joint strategies and offering feedback in a classroom. Most collaborative teaching research argues that this model brings many benefits including the engagement of students, attaining better learning results, and the creation of a teaching environment based on support. For instance, Friend, Cook, Hurley-Chamberlain, and Shamberger (2010) found that collaborative teaching led to improved academic outcomes and increased student engagement. Additionally, Murawski and Swanson (2001) highlighted that collaborative teaching fosters a supportive learning environment that benefits both teachers and students. The interactive working inherent in this model is compatible with social learning theory, as it utilizes social resources, peer modeling, and collective experiences to enhance the learning process.

Teachers' attitudes towards cybercrime prevention are essential in determining their engagement with and effectiveness in implementing security measures. Positive attitudes towards cyber-security are associated with higher levels of vigilance and proactive behavior in preventing cybercrime (Harrison & Gifford, 2022). Conversely, a lack of confidence or perceived relevance can lead to inadequate attention to cyber-security protocols (Johnson & Lee, 2021).

Teachers' attitudes towards cybercrime prevention are essential in determining their engagement with and effectiveness in implementing security measures. Positive attitudes towards cyber-security are associated with higher levels of vigilance and proactive behavior in preventing cybercrime (Harrison & Gifford, 2022). Conversely, a lack of confidence or perceived relevance can lead to inadequate attention to cyber-security protocols (Johnson & Lee, 2021).

The inclusion of social learning theory into the study of cybercrime prevention among pre-service teachers will offer a theoretical model that would explain how observational learning, cognitive processes, as well as social interactions lead to changes in the attitudes and behaviors related to cyber-security. Teachers' attitudes toward collaborative learning strategies and cybercrime prevention play a crucial role in their effectiveness. Positive attitudes towards collaborative learning are associated with higher student engagement and improved outcomes, as these strategies foster critical thinking, communication, and teamwork (Slavin, 2015). However, some teachers resist these methods due to concerns about classroom management and group dynamics, which can be mitigated through professional development and clear guidelines (Gillies, 2016. Similarly, teachers' proactive stance on cybercrime prevention is essential for maintaining a safe online environment.

Teachers' use of collaborative learning strategies and their approach to cybercrime prevention are critical aspects of effective education. Collaborative learning strategies, which enhance students' critical thinking, communication, and teamwork, are more effectively implemented when teachers receive training focused on these methods. Teacher training programs that emphasize collaborative learning can improve the adoption and success of these strategies in the classroom. Despite the benefits, some teachers face challenges such as classroom management and unequal group participation, which can be addressed through targeted professional development and support (Cohen & Lotan, 2014).

In terms of cybercrime prevention, integrating these concerns into the curriculum is essential for creating a safe online environment for students. Teachers who prioritize cybercrime education are better prepared to address issues like online harassment and identity theft, equipping students with skills to navigate digital spaces safely (Livingstone & Haddon, 2009). Ongoing professional development and collaboration with cybersecurity experts can help teachers stay updated on evolving cyber threats and enhance their effectiveness in teaching cyber safety (Kaspersky, 2020). These strategies will, beyond the mere theoretical basis of this study, give practical ideas for pre-service teachers and policymakers that are in the process of strengthening cyber resiliency in the educational sector.

METHODS

Research Design

The study utilized quantitative method that could be clearly communicated through numbers. It was appropriate because information were collected using sampling methods, quantifying and analyzing variables

so as to get results (Creswell & Creswell, 2018). The study employed a quasi-experimental design using pre-test and post-test surveys to compare attitudes toward cybercrime prevention between pre-service teachers exposed to cooperative learning strategies and those not exposed.

According to McBumey & White (2007), quasi experiment is a research procedure in which the scientist has to choose individuals on the basis of different conditions from other existing groups. Shadish, Cook, & Cambell (2002), while affirming that quasi experimental design means a type of research design which does not incorporate the element of random assignment.. Diagrammatically explanation

E_1: O_1 X_1 O_2 (Cooperative Learning Strategy)
E_2: O_3 X_2 O_4 (Control group),
Where: O_1 &O_3 Observations before
O_4, O_2 Observations after
E_1 Cooperative Learning Strategy
E_2: Control group

Population of the Study

The population of the study comprised pre-service teachers enrolled in Social Studies Education departments across two universities in the Southwest region of Nigeria.

Sample and Sampling Technique

The sample for the study consisted of 67 (39 Experimental & 28 Control) pre-service teachers. The sample was selected using multistage sampling procedure. Stage one involved the grouping of Southwest region of Nigeria into Six States. At the second stage, two states were selected using simple random sampling technique after which a public university was chosen from each of the selected states using purposive random sampling technique. The reason for this was that the privately own universities in Southwest, Nigeria do not have teacher education as a course of study in their curriculum. The samples were selected using contact class. This was done by considering only pre-service teachers studying social studies in 400 level in each of the selected universities after which they were assigned to experimental and control groups respectively.

Research Instruments

Three research instruments tagged Cooperative Learning Strategy Guide and Lecture Note (CLSG), Conventional Method Guide and Lecture Note (CMG) and Attitude to Cybercrime Prevention Scale (ACPS) were used for this study. The Cooperative Learning Strategy Guide and Lecture Note (CLSG) and Conventional Method Guide and Lecture Note (CMG) are lecture guide used by the research assistants who taught the pre-service cybercrime prevention. The Attitude to Cybercrime Prevention Scale (ACPS) is a questionnaire which was used to determine the attitude of the pre-service teachers towards cybercrime prevention before and after exposing them to the treatments. The questionnaire was rated using 4-likert scales of Strongly agreed (SA) = 4points, Agreed (A) =3 points, Disagreed (D) = 2 points and Strongly Disagreed (SD) = 1 point.

Validity and Reliability of the Instruments

The validity of the instruments was ensured by three experts in Social Studies Education from the Ekiti State University, Ado-Ekiti. The corrections and suggestions made by them were affected before they were used.

The reliability of the Attitude to Cybercrime Prevention Scale (ACPS) was determined using Cronbach Alpha. This was done by administering the instruments to 10 pre-service teachers who were not part of the sample used for the study. The scores obtained from the instrument were tested using Cronbach Alpha and a reliability coefficient of 0.89 was obtained and this was high enough for the instrument to be used for the study. The reliability of the Cooperative Learning Strategy Guide and Lecture Note (CLSG) and Conventional Method Guide and Lecture Note (CMG) were not determined because they were used as teaching guides.

Experimental Procedure

The research experimental procedure took place in three stages namely pre-treatment, Treatment and post-treatment stages. At the pre-treatment stage, the Attitude to Cybercrime Prevention Scale (ACPS) was administered on the pre-service teacher. During the treatment stage, the pre-service teachers were exposed to the treatment while teaching them cybercrime prevention. The third stage is the post treatment stage. At this stage, the Attitude to Cybercrime Prevention Scale (ACPS) was administered on the pre-service teachers after it had been re-shuffled in other to avoid test-wiseness.

Data Analysis

The basic and simple quantitative data analysis tools employed were descriptive as well as inferential statistics. In answering the research questions, the research relied on frequency counts, means, standard deviations as well as bar charts. Various hypotheses were analyzed with the help of a t-test at a significance level equal to 0. 05. The preconditions of normality, homogeneity, and linearity were maintained while analyzing the data, and demographic variables were taken into account. Descriptive statistics offered an overview of the data collected and gave the reader in a much better understanding of the results of the research Inferential statistics on the other hand offered a way of testing the hypothesis to the letter, they took the results beyond a mere presentation of numbers.

RESULTS

The results of the Shapiro-Wilk test showed that both pre-test and post-test scores of the experimental and control group are normally distributed as the calculated value was greater than 0. 05. The homogeneity required for the test was checked with the Levene's test for equality of variances and the results showed that the variances of the groups were equal ($p > 0. 05$). The condition of linearity was ascertained through the scatter plot analysis of the pre-test and post-test scores indicating positive linearity. Furthermore, the participants' demographic data such as age, sex, and previous awareness of cybercrime prevention were compared to confirm the likeness of the two groups, that is experimental and control, where it was noted that there was no significant difference.

Research Question 1: What is the attitude of Social Studies pre-service teachers towards cybercrime prevention before and after exposing them to cooperative learning strategy?

Table 1: Mean and Standard deviation of the attitude of Social Studies pre-service teachers towards cybercrime prevention before and after exposing them to cooperative learning

Variable		N	Mean	S.D
Experimental (Cooperative Learning)	Before	39	52.64	7.18
	After	39	70.56	7.39
Control (Conventional Method)	Before	28	50.43	6.44
	After	28	65.32	8.65

The result in table 1 revealed notable difference between the experimental and control group with experimental group having substantial increase in attitude scores after exposing the Social Studies pre-service teacher to cooperative learning strategy moving from 52.64 to 70.56. On the other hand, the control group despite showing an improvement from 50.43 to 65.53 had a lower mean attitude score compared to the Experimental group after treatment. This is further depicted on figure 1 below.

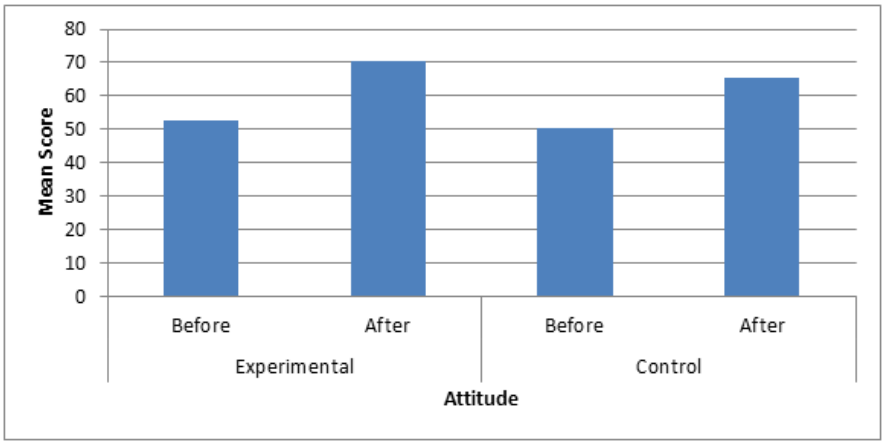

Figure 1: Bar Chart of the mean and standard deviation of the attitude of pre-service teachers towards cybercrime prevention before and after exposing them to cooperative learning

Research Question 2: What is the mean difference in the attitude of Social Studies pre-service teachers in the treatment and control groups toward cybercrime prevention?

Table 2: Mean difference of the attitude of Social Studies pre-service teachers towards cybercrime prevention before and after exposing them to cooperative learning

Variable		N	Mean	S.D	Mean Difference	Ranking
Experimental (Cooperative Learning)	Before	39	52.64	7.18	**17.92**	1st
	After	39	70.56	7.39		
Control (Conventional Method)	Before	28	50.43	6.44	**14.89**	2nd
	After	28	65.32	8.65		

From table 2, pre-service teachers in the experimental group have a substantial mean difference of 17.92 indicating a significant increase from 52.92 to 70.56. The significant improvement earned the experimental group the top ranking in terms of attitude change. However, the control group which is pre-service teachers exposed to the conventional method also showed a positive mean difference of 14.89 reflecting an increase in attitude scores from 50.43 to 65.32. It was however lower in magnitude compared to the experimental group. This revealed the effectiveness of cooperative learning in enhancing social studies and service teachers' attitudes towards cybercrime prevention.

Testing of Hypotheses

Hypothesis 1: There is no significant difference in the attitude of Social Studies pre-service teachers toward cybercrime prevention before and after exposing them to cooperative learning strategy.

Table 3: t-test analysis of the significant difference in the attitude of Social Studies pre-service teachers toward cybercrime prevention before and after exposing them to cooperative learning strategy

Variable	N	MEAN	S.D	Df	t_{cal}	P_{value}
Before Treatment	39	52.64	7.18			
				76	10.87	0.00
After Treatment	39	70.56	7.39			

The t-test analysis of Table 3's result revealed a computed t-value (t-cal) = 10.87, indicating a highly significant ($p<0.001$) difference in pre-service teachers' attitudes toward cybercrime prevention before and after they were exposed to cooperative learning. Thus, the theory was disproved. This suggests that the cooperative learning strategy's success in influencing pre-service Social Studies teachers' attitudes toward cybercrime prevention was the reason for the attitude shift.

Hypothesis 2: There is no significant difference in the attitude of Social Studies pre-service teachers in the experimental and control group towards cybercrime prevention after exposing them to cooperative learning strategy.

Table 4: t-test analysis of the significant difference in the attitude of Social Studies pre-service teachers in the experimental and control group towards cybercrime prevention after exposing them to cooperative learning strategy

Variable	N	MEAN	S.D	Df	t_{cal}	P_{value}
Experimental (Cooperative Learning)	39	70.56	7.39	65	2.67	0.01
Control (Conventional Method)	28	65.32	8.65			

Table 4 revealed that the calculated t-value (t-cal) of 2.67 has a corresponding p-value of 0.01. The hypothesis is therefore rejected. Hence, there is statistically significant difference in the attitude of pre-service teachers towards cybercrime prevention between the experimental and control groups after exposing them to cooperative learning strategy. The lower p-value indicated the effectiveness of cooperative learning in influencing pre-service teachers' attitude towards cybercrime prevention when compared to conventional methods.

Findings

1. Pre-service teachers in social studies have shown favorable behavioral changes, which suggests that the cooperative learning approach significantly improved their attitudes toward preventing cybercrime.
2. Compared to the traditional approach, the mean attitude score difference between the treatment and control groups was 3.03 in favor of the treatment group, indicating a stronger positive influence of cooperative learning strategy on the attitudes of Social Studies pre-service teachers toward cybercrime prevention.
3. After being introduced to cooperative learning strategies, pre-service Social Studies teachers' attitudes regarding preventing cybercrime have significantly changed.
4. After being exposed to a cooperative learning technique, there is a noteworthy distinction in the attitudes of pre-service teachers of Social Studies between the experimental and control groups.

DISCUSSION

The study's findings indicate that the cooperative learning strategy significantly influences Social Studies pre-service teachers' attitudes towards cybercrime prevention. This effect can be attributed to the active engagement and collaboration fostered by the cooperative learning approach. By involving pre-service teachers in group discussions, problem-solving tasks, and shared learning experiences, the strategy promotes interactive engagement, which is crucial for developing and internalizing positive attitudes towards cybercrime prevention. These results align with Bandura's Social Learning Theory (1977), which highlights the importance of observational learning, imitation, and social influence in shaping learners' attitudes and behaviors. According to Bandura, individuals learn and adopt new behaviors by observing others, especially in social contexts where they can model their behavior after peers or mentors. In the context of this study, cooperative learning provides ample opportunities for peer observation and interaction, thereby allowing pre-service teachers to observe and imitate positive behaviors related to cybercrime prevention. Bandura (1977) emphasizes that social influence

and peer interactions play a critical role in attitude formation and behavioral change. The cooperative learning environment enables pre-service teachers to engage with peers who model effective attitudes and practices concerning cybercrime prevention. As they collaborate and share experiences, these interactions reinforce positive attitudes and encourage the adoption of best practices in cyber-security. Furthermore, the interactive nature of cooperative learning supports the development of critical thinking and problem-solving skills, which are essential for understanding and addressing cybercrime. By actively participating in discussions and problem-solving tasks, pre-service teachers not only enhance their knowledge but also internalize attitudes and behaviors that are conducive to effective cybercrime prevention.

The introduction of cooperative learning strategies led to a notable improvement in pre-service Social Studies teachers' attitudes toward preventing cybercrime. The mean attitude score difference of 3.03 between the treatment and control groups indicates a substantial positive impact of cooperative learning on these attitudes. This finding aligns with Abramczyk and Jurkowski (2020), who reveals the benefits of cooperative learning, including enhanced attitudes, increased involvement, and improved learning outcomes. Their research suggests that cooperative learning fosters individualized learning experiences and provides broader academic and social benefits, which are consistent with the positive changes observed in this study. Abramczyk and Jurkowski (2020) highlight that cooperative learning's effectiveness lies in its ability to engage students actively, promoting both academic success and positive social interactions. This mirrors the observed increase in the treatment group's positive attitudes toward cybercrime prevention, reflecting the strategy's capacity to enhance engagement and motivation. Additionally, Namaziandost et al. (2020) emphasize that cooperative learning improves learning proficiency, which is consistent with the enhanced attitudes noted in the current study. Their findings suggest that cooperative learning strategies can lead to better understanding and retention of complex concepts, such as those related to cyber-security. Li et al. (2022) discusses the simplicity of teaching and disciplinary integration facilitated by cooperative learning approaches. This ease of integration may contribute to the effectiveness observed in this study, as cooperative learning not only simplifies instructional delivery but also integrates diverse learning objectives, such as cybercrime prevention. Furthermore, Silva et al. (2022) and Muñoz-Martínez et al. (2020) explore how cooperative learning enhances critical thinking, fairness, social justice, and inclusivity within the educational environment. These aspects are particularly relevant to the study, as the cooperative learning strategies employed likely fostered a more inclusive and equitable learning experience, thereby improving attitudes toward cybercrime prevention.

The study reveals a significant difference in the attitudes of pre-service teachers of Social Studies between those exposed to cooperative learning techniques and those in the control group. This finding is consistent with Niemi (2021), who emphasizes that cooperative learning not only enhances a sense of community and collegiality but also aligns participants with shared learning objectives. Niemi's research suggests that cooperative learning fosters candid conversations, commitment, targeted preparation, and adaptability among learners, all of which contribute to improved educational outcomes. Moreover, the study's results echo the sentiments of Herath et al. (2016), who highlight the role of hands-on, interactive approaches in developing positive attitudes and behaviors towards cyber-security. Herath et al. (2016) argue that interactive and practical learning experiences are crucial for cultivating awareness and proactive behaviors in cyber-crime prevention. Cooperative learning techniques, by their nature, provide such interactive experiences, reinforcing the practical application of knowledge and skills related to cyber-security among pre-service teachers. This alignment with Herath et al.'s (2016) findings reveals the broader implications of cooperative learning beyond traditional educational goals, extending into areas such as digital literacy and cyber-security. In addition, the contrast between the experimental and control groups aligns with other studies that have documented the benefits of cooperative learning in enhancing not just academic achievement but also behavioral and attitudinal outcomes. For instance, Johnson and Johnson (2009) argue that cooperative learning strategies lead to increased motivation, improved interpersonal skills, and greater academic success, which are supported by the findings of the present study. These outcomes are particularly relevant in the context of pre-service teacher education, where the development of collaborative skills and positive attitudes towards new teaching methodologies is essential for effective teaching practices. The study's findings contribute to the existing literature by reinforcing the value of cooperative learning techniques in pre-

service teacher training and extending its benefits to areas such as cyber-security awareness. Future research could further explore how these cooperative learning strategies can be tailored to address specific educational needs and contexts, particularly in areas related to digital literacy and online safety.

CONCLUSION

The study findings emphasized the influence of cooperative learning strategy on improving Social Studies pre-service teachers' attitude towards cybercrime prevention in Southwest, Nigeria. Through active engagement, peer influence, hand-on- learning experiences, and group learning opportunities, cooperative learning strategy facilitates positive change in attitudes among pre-service teachers. The change will be reflected in increased awareness of cyber threat, enhanced readiness to tackle cybercrime-related issues, positive transformation in behaviours promoting digital literacy and security practices and professionalism in navigating digital responsibility.

Integrating cooperative learning strategies into educational curriculum in higher institutions in Southwest, Nigeria will effectively give room for a proactive stance towards cybercrime prevention among pre-service teachers, significantly be of relevance to both individual teachers knowledge and skills and creating room for a safer digital learning environment for students or learners.

Conduct comparative studies to evaluate the effectiveness of cooperative learning strategies against other pedagogical approaches in improving attitudes toward cybercrime prevention. This can help identify the most effective strategies for enhancing digital literacy and security.

The researcher initially found it difficult to convince the research assistant who assisted him during the treatment stage to partake in the study. However, the time spent convincing the research assistants did not in any way affect the findings of the study.

This study will be immensely useful to the Ministry of education to plan policies and programs that will inform and empower teachers, educational institutions, policymakers, and other stakeholders in solving cyber-security challenges by using innovative and impactful teaching strategies which will ultimately contribute to a safer digital learning environment and encouraging a culture of cybercrime prevention and digital responsibility among teachers and learners.

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