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SCHOOL CLIMATE, LEADERSHIP COMPETENCY, AND SELF-EFFICACY IN TECHNOLOGY AMONG TEACHERS: A PATH MODEL ON ATTITUDE TOWARDS TECHNOLOGY IN PUBLIC ELEMENTARY SCHOOLS

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Abstract:
This study was conducted to determine the best-fit path model for attitude towards technology among public elementary school teachers in Region XII, Philippines, as estimated by school climate, leadership competency and self-efficacy in technology. The study used a quantitative, non-experimental research design using correlation and path analysis. A total of 400 elementary teachers from Sarangani, General Santos, Koronadal and South Cotabato Divisions were surveyed using the Raosoft sample size calculator and stratified random sampling technique. Mean, Pearson r and path analysis were used as statistical tools. Moreover, adapted, modified, and validated survey questionnaires were used to gather pertinent data. Findings revealed a very high level of school climate, leadership competency and self-efficacy in technology. Consequently, the level of attitude toward technology among the public-school elementary teachers was rated high. Further, significant correlations were found between school climate and attitude towards technology; leadership competency and attitude towards technology, and self-efficacy in technology and attitude towards technology. Moreover, results showed that Model 3 came out as the best-fit path model. The model showed that school climate, leadership competency, and technology self-efficacy directly affect the attitude toward technology among public elementary school teachers. This implies that the Department of Education should prioritize enhancing school climate, leadership development, and technology

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training programs as these factors significantly influence teachers' technological acceptance.

Keywords: educational management, school climate, leadership competency, self-efficacy in technology, attitude towards technology, path analysis, DepEd teachers, Region XII, Philippines

1. Introduction

Teachers' attitudes are a major factor influencing technology adoption and integration, with negative attitudes stemming from factors like poor infrastructure support and lack of leadership vision acting as barriers (Lee *et al.*, 2019). Teachers with negative attitudes toward technology may resist or avoid using new educational technologies, hindering their implementation and limiting students' potential benefits (Scherer *et al.*, 2019). Teachers may persist in employing conventional teaching methods, which may restrict students' access to innovative and compelling learning experiences that are facilitated by technology (Voogt *et al.*, 2018). Additionally, the problem may be compounded by teachers with unfavorable attitudes toward technology being less motivated to get involved in training related to technology integration (Koh *et al.*, 2021).

In connection, the attitude of teachers towards technology in the classroom greatly affects the adoption and use of new tools for education and learning. Hence, it is a vital field of research (Smith, 2021). Deeper knowledge of the practices and outcomes of technology integration in the classroom depends on a better awareness of the attitude of teachers (Tondeur, Gille, McKenzie, van Braak, Siddiq & Scherer, 2021). Assessing teacher attitudes facilitates the evaluation of the long-term effects of interventions such as technology-oriented training on cognition. Monitoring attitudinal changes enables the evaluation of effective measures for fostering acceptance of technology integration (Siddiq, 2022).

Studies show that school climate affects the attitude and openness toward utilizing technology in the classroom. Positive school climate elements, including cooperative cultures, effective principal leadership, teacher involvement in decision-making, and high-quality professional development, correspond, according to studies, with more favorable teacher attitudes about technology integration (Anderson & Lin, 2020). Bastasa and Guhao (2024) state that school heads must consider all teachers as equal individuals to implement faculty recommendations. Hence, a supportive climate with a shared vision, technology access, training, and peer support is linked to lower computer anxiety and more confidence among teachers in using digital tools (Smith, Jones & Johnson, 2022). In general, a significant connection was found between teachers' attitudes toward technology and school climate (Raygan & Moradkhani, 2022).

Additionally, recent studies have investigated how technology leadership competency correlates with and influences teachers' attitudes toward classroom technology integration. School administrators and technology coordinators with skills in strategic planning, technology management, professional development, and creating a supportive technology climate have been found to foster more positive teacher attitudes toward technology (Johnson, 2022; Peters, 2020). Teachers who report higher degrees of technology self-efficacy, value attitudes about technology, and purpose to incorporate digital tools have correspondingly higher degrees of technological leadership (Smith *et al.*, 2022). Celep and Tulubaş (2014) countered that teachers' favourable or negative opinions of educational technology are not much influenced by the technological leadership of principals.

Likewise, several research has shown that teachers' technological self-efficacy favourably correlates with teachers' attitudes towards technology (Kao *et al.*, 2020). Higher tech self-efficacy teachers have more favourable opinions of technology and less technophobia (Smith, 2021). Improved attitudes and receptivity toward implementing new instructional technologies have been linked to training and professional development emphasizing technology skills and classroom experience for developing teachers' technological self-efficacy (Anderson, Groulx & Maninger, 2022).

Although studies on school climate, leadership competency, self-efficacy in technology, and attitude toward technology have already been conducted, there are still major knowledge gaps about these complex interactions—especially in particular educational settings (Williams, Gomez & Kurkiewicz, 2020). Most research looks at one or two variables, hence, it is unknown how all the elements interact to influence the attitude of teachers towards technology (Anderson & Lin, 2020). This study stands out as uniquely comprehensive in its examination of multiple variables influencing teachers' attitudes toward classroom technology integration. Rather than looking only at technology skills or leadership, it considers the connections between technology leadership competencies amongst administrators, teacher self-efficacy in technology, and the broader school climate.

Consequently, there is an imperative need to do more study on educators' perceptions of technology and its influence on their teaching methodologies. As technology progresses swiftly and becomes more interwoven into education, it is essential to comprehend teachers' perceptions of these developments to ensure appropriate assistance is offered. Through this study, we can proactively develop better change management and professional development programs to ensure digital transformation in education has the best chance of success. Acting urgently could help prevent an expanding skills and utilization gap.

This study determined the predictive model of attitude towards technology in public elementary schools in Region XII. Specifically, it intended to achieve the following objectives: first, it evaluated the school climate in public elementary schools in terms of collaboration, student relations, school resources, decision-making, and instructional innovation. Second, it determined the level of leadership competency of the school head in terms of leadership and vision, learning and teaching, productivity and professional practice, support, management, and operations, assessment and evaluation; and social, legal, and ethical issues. Third, the study sought to assess the level of self-efficacy of teachers in technology across areas like technology proficiency, teacher professional development and instruction, and emerging technologies for student learning. Fourth, the study determined the level of attitude towards technology among public elementary school teachers across factors such as belief, anxiety, and implementation. Fifth, it intended to determine if there are significant relationships between school climate and attitude towards technology; leadership competency and attitude towards technology; and self-efficacy in technology and attitude towards technology. Lastly, it determined the best-fit model that predicts attitudes toward technology among public elementary school teachers in Region XII.

Moreover, the following null hypotheses of this study were tested at a 0.05 level of significance. This paper hypothesized that there is no significant relationship between school climate and the attitude of teachers towards technology. In addition, it is also believed that there is no significant relationship between leadership competency and attitude toward technology and between self-efficacy in technology and attitude toward technology. Lastly, this study hypothesized that there is no best-fit model that predicts attitudes toward technology among public elementary school teachers in Region XII.

Therefore, this study is grounded in the Technology Acceptance Model developed by Davis (1989). It is a hypothesis that guides our projections and comprehension of how people might embrace and use new technology. Two key things decide a person's willingness to use technology: how useful they think it is and how easy they think it is to use. A lot of studies have built on the Technology Acceptance Model (TAM) and used it in education by looking into what makes teachers accept and use teaching technology (Scherer *et al.*, 2019; Siyam, 2019).

Additionally, Technological Pedagogical Content Knowledge (TPACK) introduced by Koehler and Mishra (2006) supports the Technology Acceptance Model. It highlighted the interplay of instructors' expertise in technology, pedagogy, and content, which affects technology acceptance in educational settings. The Technology Acceptance Model emphasizes perceived utility and simplicity of use, but Technological Pedagogical Content Knowledge illustrates that successful technology integration necessitates educators to cultivate intricate, interrelated knowledge across several areas. The congruence between both models is apparent, since Technological Pedagogical Content Knowledge (TPACK) focus on the cultivation of technology knowledge may directly influence educators' perceived simplicity of usage and utility, which are important factors in the Technology Acceptance Model.

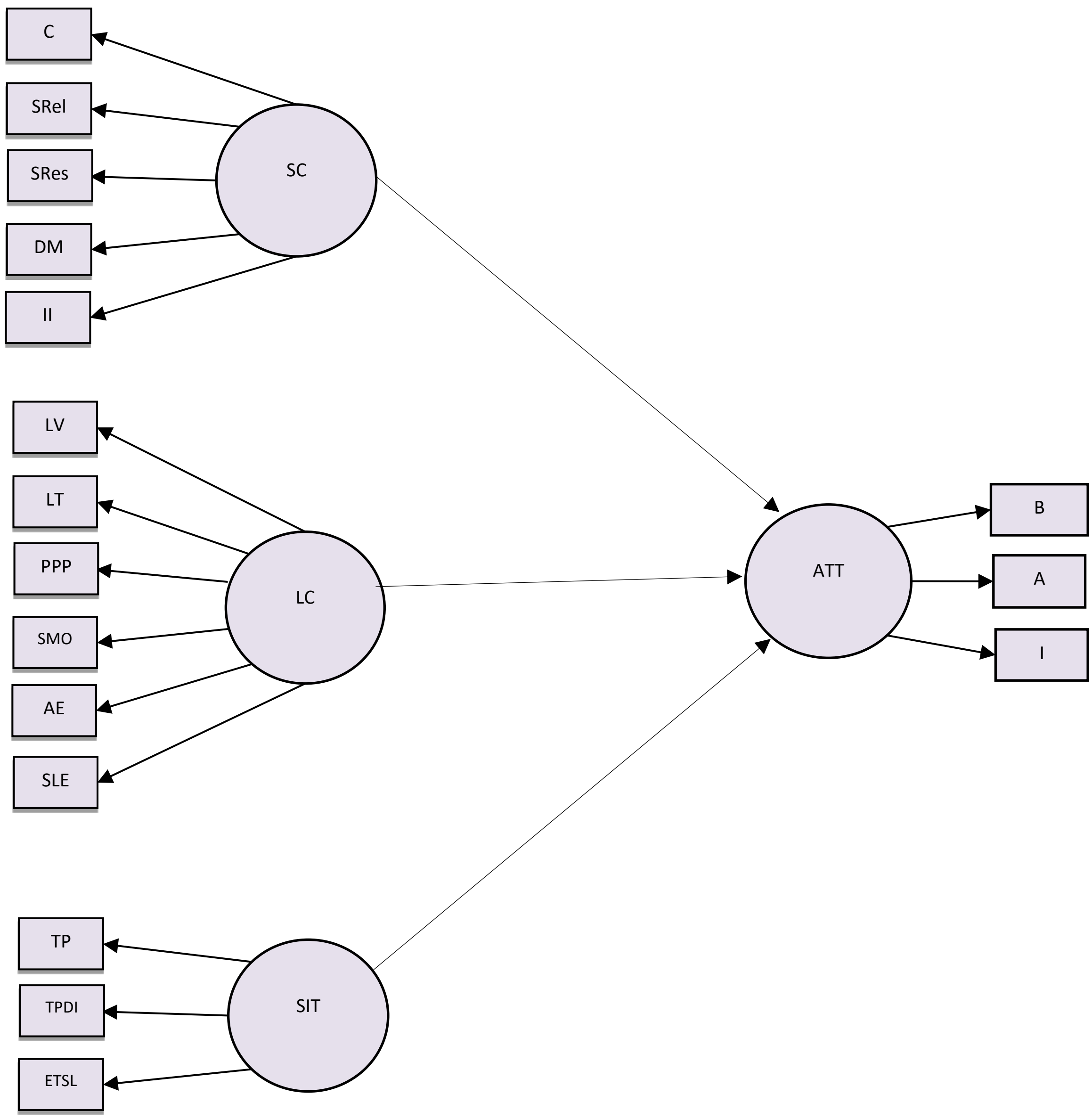
Moreover, Ajzen's (1985) Theory of Planned Behavior (TPB) captures the way technological self-efficacy influences teachers' opinions of technology. According to the Theory of Planned Behaviour, intentions, which subsequently regulate activities, are shaped by attitudes and perceived behavioral control. Teachers with higher technical self-efficacy often have better opinions because they feel more in control. By means of technical abilities and pedagogical frameworks, one may enhance self-efficacy, attitudes, and intents on technology use (Hou *et al.*, 2022).

Furthermore, proposed by Tagiuri and Litwin (1968), the Organizational Climate Theory stresses teacher attitudes and the impact of school environment aspects including relationships, leadership, norms, and values. Strong leadership, teamwork, a common objective, and a focus on development define an atmosphere that shapes more favourable teacher attitudes regarding technology integration. Moreover, shaping teacher self-efficacy is the surroundings. Leaders aiming to influence attitudes and encourage the acceptance of technology have to establish a suitable environment (Aldridge & Fraser, 2019).

Figure 1 depicts the hypothesized model that will be the best fit for teachers' attitudes toward technology in public elementary schools in Region XII. It has two types of latent constructs, namely exogenous and endogenous variables. The first exogenous variable is school climate, which has six observable indicators, namely collaboration, student relations, school resources, sense of belonging to the school, decision-making, and instructional innovation. The second exogenous variable is the leadership competency with six indicators, namely: leadership and vision, learning and teaching, productivity and professional practice, support, management, and operations, assessment and evaluation, and social, legal, and ethical issues. The third exogenous variable is self-efficacy in technology. It has three indicators that involve technology proficiency, teacher professional development and instruction, and emerging technologies for student learning. Finally, the endogenous variable is the attitude towards technology. It has three observable indicators, namely, belief, anxiety, and implementation.

The hypothesized model shows that school climate, leadership competency, and self-efficacy in technology predict the attitude toward technology.

Figure 1: Hypothesized Model on The Interrelationship among School Climate, Leadership Competency, Self-Efficacy in Technology, and Attitude Towards Technology in Public Elementary Schools



Legend:

LC = Leadership Competency; ATTT = Attitude Towards Technology; LV = Leadership and Vision; B = Belief; LT = Learning and Teaching; A = Anxiety; PPP - Productivity and Professional Practice; I = Implementation; SMO = Support, Management, and Operations; AE = Assessment and Evaluation; SLE - Social, Legal, and Ethical Issues; SIT = Self-efficacy in Technology; SC = School Climate; TP = Technology Proficiency; C = Collaboration; TPDI = Teacher Professional; Development and Instruction; DM = Decision Making; ETSL = Emerging Technologies for Student Learning; SRel = Student Relations; II = Instructional Innovation; SRes = School Resource

2. Literature Review

Quines and Relacion (2022) stated that a positive school climate is a crucial notion that would enhance the success and welfare levels we want to achieve in educational institutions. School members have significant duties in creating an atmosphere characterized by mutual honesty, trust, and respect, which they want to inhabit. Using restorative justice disciplinary techniques and social-emotional development projects helps to foster compassion, inclusion, and close ties among people of communities (Wang *et al.*, 2023). Similarly, distributed leadership frameworks that empower teachers and students in decision-making contribute to the establishment of good, affirming learning environments (Aldridge & Fraser, 2019).

Moreover, establishing a good school climate with high efficiency requires teachers to promote a pleasant atmosphere for every student in the institution, thus facilitating their study. This means demonstrating children in their academic work free from regard for social status as well as developing good relationships with parents and other teachers from many socioeconomic backgrounds. The ultimate goal is to create an inclusive society wherein families, workers, and students, all of whom feel valued and free to grow—may coexist (Ferrando & Guhao, 2024).

Schools hoping to use digital technologies to improve instruction and learning depend on effective technology leadership. To properly start and run educational technology projects, technology executives need a sophisticated set of skills (McLeod & Richardson, 2019). Above all, they must have a vision that corresponds with educational objectives and precisely states how technology might help many stakeholders reach these goals (Richardson *et al.*, 2020). Technology leaders should concentrate on capacity development by means of professional training and coaching to improve teachers' competency in utilizing digital technologies, hence raising their confidence in these tools (Courduff *et al.*, 2022). They have to persuade decision-makers convincingly, get organizational support, and encourage agreement among teachers on technology-enhanced teaching approaches (Varier *et al.*, 2022).

Furthermore, Bongcayat and Guhao (2020) explained that a high rating for the technology leadership of non-teaching staff demonstrates that these personnel promote inclusive and varied technology integration across the school. They accomplish this by providing ongoing training and prompt equipment fixes to support users, leveraging school-wide data to assess how technology is meeting both administrative and instructional needs, and motivating teachers and employees to take advantage of professional development resources focused on educational technology. Through these endeavors, non-teaching technology executives establish the infrastructure, policy, and culture necessary to facilitate the successful and diverse adoption of technology that benefits the entire school community.

Additionally, Miraflor and Quines (2022) explained that teachers’ self-efficacy is greatly influenced by their knowledge about certain things. Actual technology integration in classrooms is much influenced by teachers' self-efficacy—that is, their confidence in utilizing digital technologies efficiently for instruction—defined as First, more favorable opinions of the effects of educational technology among instructors depend much on better-perceived self-efficacy (Gürfidan & Koç, 2020). Teachers who express stronger technological self-efficacy also show more experimentation with new educational tools and more tenacity in overcoming technical difficulties that develop (Hsu, 2020.). Teachers with strong technological self-efficacy also embrace student-centered pedagogies that employ technology (Yusop & Budiman, 2023), therefore giving their pupils more chances for meaningful, real technology usage.

Moreover, Guhao (2019) clarified that self-efficacy is a driving force that one can successfully finish a job by using their competencies and skills. Strong self-efficacy teachers know they can successfully remove challenges from the classroom. Guhao and Sioting (2023) further explained that during the educational process, this self-assurance helps them to control their emotions, ideas, and behavior. Individuals who possess high self-efficacy have confidence in their ability to overcome challenges and achieve their objectives. Quines and Pablo (2023) added that teachers' self-efficacy is a critical factor in the determination of significant academic outcomes, including students' motivation and achievement, as well as their overall well-being in the workplace

Furthermore, teachers exhibit a variety of perspectives regarding classroom technology, including enthusiastic adoption, skepticism, and rejection. Educators who regard technology as consistent with pedagogical principles and educational objectives are inclined to cultivate favorable attitudes, as evidenced by their high levels of self-efficacy and frequency of adoption (Mamun, 2022).

Additionally, sufficient access to up-to-date digital tools and ongoing, context-specific training correlate strongly with favorable teacher attitudes (Cho *et al.*, 2022). In the same vein, robust technological-pedagogical knowledge enables dynamic use cases tailored to content goals rather than technology for its own sake (Yot-Domínguez & Marcelo, 2019). Fredeluces, Garcia and Quines (2023) clarified further that technology in education has become ever more common and helpful for both instructors and students alike. Teachers may transform their classrooms and improve the learning environment by adopting digital tools and procedures.

Consequently, examining educators' attitudes towards educational technology is essential for fulfilling Sustainable Development Goal 4, which aims to provide everyone with inclusive and fair quality education and promote lifelong learning chances. Teachers are front-line integrators of technology into classrooms; their acceptance and competent use of these tools are essential to releasing the potential of technology to change learning. Policymakers and school administrators will be able to provide improved technological infrastructure, teacher professional development, and pedagogical assistance by knowing elements that influence either favourable or negative sentiments among instructors. Tracking changes in teacher technology viewpoints helps stakeholders to constantly modify digital learning projects to guarantee suitable, meaningful technology use that ensures appropriate, relevant technology use, providing quality, relevant 21st-century education to all students, regardless of gender, socioeconomic level, or location.

This research might help the school heads to build better professional development, technical assistance, and leadership chances that enable teachers to successfully utilize technology in their classrooms and learning environment. Moreover, this study will help educators to better grasp their readiness and confidence to apply technology in the classroom, enabling targeted professional development to increase technology adoption and guarantee teachers have the tools they need to use technology in ways that improve student learning and equip students for the modern world. Furthermore, the learners will benefit from this study to ensure learners receive the full benefits of educational technology integration including more engaging, student-centered instruction and the development of skills in digital literacy that prepare them for the modern world. Lastly, since this study was only conducted in Region XII, this will provide future researchers valuable insights to build upon through further exploration of this topic across educational contexts, demographics, and technologies to inform policies and practices that support teacher success with educational technology integration.

3. Material and Methods

Teachers in public elementary schools in Region XII of the Philippines participated in the study. 23,569 public elementary teachers in the area met the requirements to participate in this survey as respondents. The researcher used a Raosoft sample size calculator, which suggested 379 respondents. However, it surveyed 400 teachers as the maximum number of study respondents. The respondents were split down as follows: General Santos City (99), Koronadal City (32), South Cotabato (148), and Sarangani (121).

The Raosoft sample size calculator was utilized in determining the number of respondents per division. In research, Raosoft's online sample size calculator is a frequently used instrument to find the minimal suggested sample for a study population that would get the intended statistical confidence level and margin of error (Ekore & Okekeocha, 2022). Raosoft computes the minimum sample size needed for those specifications. This allows researchers to derive an appropriately sized sample that provides a level of probability that the sample distribution accurately reflects true distribution parameters in the study population (Alhatmi, 2019).

Moreover, the research guaranteed a fair sample by using a stratified random sampling method. This is a sample wherein some group of objects from the population is selected at random using categorization as a guide. To get a single sample, the chosen sample from many strata is mixed. The method of stratified sampling is probability sampling, wherein the features of a precise variable are understood in the universe relative to this variable (Iliyasu & Etikan, 2021).

Therefore, inclusion criteria were devised to be qualified for involvement in the research as respondents. They must be teachers in public elementary schools with item positions Teacher I to III and Master Teachers I to IV, and they must possess permanent status in the Department of Education. On the other hand, the researcher excluded members of certain groups to serve as survey respondents. Principals and head teachers, among other administrative positions, were specifically excluded from the sample. Moreover, the sample comprised teachers exclusively from public schools; private school teachers will not be included. However, respondents' participation in the survey was completely optional. If the teachers decided they no longer wanted to participate in the research, they were free to withdraw at any moment. The researcher made it very clear that respondents should only participate if they are motivated to do so and may quit without facing consequences.

The four instruments utilized in this study were derived from the research problem. Primary data were utilized to gather information for the study, which includes four latent constructs: school climate, leadership competency, self-efficacy in technology, and attitude towards technology. Published studies were the source of the survey questionnaire used in the course of the research. Inspired by Johnson *et al.* (2007), the school climate questionnaire consisted of five indicators: collaboration, student relations, school resources, decision-making, and instructional innovation. Additionally, the questionnaire for leadership competency was adapted from the study of Shyr (2017) with six indicators namely: leadership and vision; learning and teaching; productivity and professional practice; support, management, and operations; assessment and evaluation; and social, legal, and ethical issues. The questionnaire for self-efficacy in technology was taken from the study conducted by Christensen and Knezek (2015) with three indicators namely: technology proficiency, teacher professional development and instruction, and emerging technologies for student learning. Lastly, the attitude towards technology questionnaire was modified from research by Kilinc *et al.* (2016) with three indicators, namely: belief, anxiety, and implementation. All the survey questionnaires utilized the 5-scale Likert Scale.

Six specialists also checked the instruments to make sure the questions were credible and correct. The qualified validators meticulously examined the questionnaire's contents to ensure construct validity. The advice given to the researcher was followed. Given both internal and external validators scored the instrument a 4.76, it is seen as quite an excellent tool for content validity. After that, a pilot test utilizing Cronbach's alpha assessed the consistency of the survey items. It is a metric that quantifies the degree to which a collection of items is interconnected. Higher values on the scale indicate greater reliability (Mohsen & Reg, 2022). School Climate scored a Cronbach alpha of 0.959; leadership competency got 0.742; self-efficacy in technology earned 0.908; and attitude towards technology achieved a Cronbach alpha of 0.971 throughout the pilot assessment. All of this points to the survey questions' validity and dependability.

Scales were employed to analyze the responses of the study participants. The range 4.20-5.00 which means a very high level of school climate, leadership competency, self-efficacy in technology, and attitude towards technology are manifested/observed by public elementary teachers. The range is 3.40-4.19 which means a high level of school climate, leadership competency, self-efficacy in technology, and attitude towards technology are manifested/observed by public elementary teachers. Additionally, the range 2.60-3.39 which means a moderate level of school climate, leadership competency, self-efficacy in technology, and attitude towards technology are manifested/observed by public elementary teachers. Also, the range 1.80-2.59, which means a low level of school climate, leadership competency, self-efficacy in technology, and attitude towards technology are manifested/observed by public elementary teachers. Lastly, the range 1.00-1.79, which means a very low level of school climate, leadership competency, self-efficacy in technology, and attitude towards technology are manifested/observed by public elementary teachers.

A non-experimental research method was employed in the study, utilizing a descriptive-correlational research design. Cresswell and Gutterman (2023) explained that in descriptive-correlational research, investigators analyze the correlations between variables as they exist naturally, without altering any circumstances, to describe and quantify the degree and direction of links between phenomena in real-world contexts.

Moreover, this research used statistical techniques such as mean, Pearson correlation coefficient, regression analysis, and path analysis. This study assessed the correlation between school climate, leadership competency, and self-efficacy in technology with the attitudes towards technology among public elementary school teachers in Region XII. Mueller and Hancock (2022) said that path analysis is a statistical technique that examines direct and indirect causal relationships among several variables using different regression models to assess hypothesized patterns of influence. It enables researchers to dissect correlations into their fundamental components and assess intricate theoretical models by quantifying the amount and relevance of proposed relationships between variables using standardized route coefficients.

The following actions were undertaken to collect the relevant data for this research: The researcher first sought authorization from relevant authorities, including the regional director, superintendents, and principals, to execute the survey study inside their schools. This will ensure compliance with policies and approval to collect data. Second, upon approval, the survey questionnaires were distributed to the selected respondents. Care was taken to ensure respondent anonymity. Teachers will be given ample time to complete the survey on their own time. Reminders will be sent to prompt completion. Teachers who wished to opt out could voluntarily withdraw from the process. Third, completed surveys were gathered by the researcher. The survey responses were compiled for the next stage of analysis. Fourth, survey questionnaires were checked for completion and prepared for analysis by coding responses and inputting data into statistical software. Lastly, relevant data analyses were summarized in the form of tables and graphs to present the overall results and significant findings from the teacher survey responses.

The data were analyzed and interpreted using the relevant statistical methods. The mean was used to evaluate the school climate, leadership competency, self-efficacy in technology, and attitudes toward technology. Secondly, the Pearson r, or Pearson Product–Moment Correlation, is a commonly used statistic used to evaluate the strength and direction of the association between two variables (Pallant, 2022). Third, Regression Analysis was used to evaluate the substantial influence of school climate, leadership competency, self-efficacy in technology, and attitudes toward technology. Finally, Path Model Analysis was used to assess the influence of school climate, leadership competency, and self-efficacy in technology on the endogenous variable, attitude towards technology. It also examined the model fit value.

In evaluating the model's goodness of fit, many fit indices were used to ascertain the optimal fit. The subsequent requirements are as follows: Chi-Square/Degrees of Freedom (CMIN/DF) 0<value<2; Normed Fit Index (NFI) >0.95; Tucker-Lewis Index (TLI) >0.95; Comparative Fit Index (CFI) .0.95; Goodness of Fit Index (GFI) >0.95; Root Means Square of Error Approximation (RMSEA) <0.05; P of Close Fit (P-close) >0.05; and Probability Level (P-value). The combination of fit indicators will be scrutinized to evaluate the overall model fit and determine the optimal model.

This quantitative investigation included substantial ethical issues, including research integrity, confidentiality, anonymity, and compliance with university regulations. This study is guided by fundamental ethical standards like voluntary participation, informed consent, respect for respondent privacy, the avoidance of plagiarism or fabrication, obtaining authorization, and the prevention of conflicts of interest or deception. This study adhered to the ethical guidelines established by the University of Mindanao Ethics Review Committee concerning participant treatment and data management, as evidenced by certificate number UMERC-2024-242. The following ethical considerations were followed: respondents voluntarily chose to participate on their own, the privacy and confidentiality of respondents will be respected, informed consent will be obtained from respondents before their participation, proper recruitment procedures will be used, any potential risks and benefits will be explained, plagiarism will be avoided, no data will be fabricated or falsified, permission will be obtained from the relevant organizations or locations involved, there will be no conflicts of interest or deceit, and authorship will be properly credited.

4. Results and Discussion

Table 1 shows the school climate's weighted mean of 4.23 with a standard deviation of 0.50 and a descriptive equivalent of Very High. The mean of indicators ranges from 3.85 to 4.48. This shows that teachers at the Department of Education, Region XII see their school as having a pleasant and supportive learning environment characterized by strong collaborative connections, excellent communication, and a favorable setting for teaching and learning.

Table 1: Level of School Climate

Indicators	SD	Mean	Descriptive Equivalent
Collaboration	0.52	4.48	Very High
Student Relations	0.66	4.18	High
School Resources	0.74	3.85	High
Decision Making	0.69	4.18	High
Instructional Innovation	0.59	4.46	Very High
Overall	**0.50**	**4.23**	**Very High**

Additionally, results show that Collaboration got the highest mean value of 4.48. This indicates that educators place a high emphasis on collaboration with peers and the adoption of new pedagogical approaches. Teachers are constantly collaborating towards the common goal of the school. Meanwhile, School Resources, with a mean value of 3.85, gained the lowest mean value among the five indicators. This indicates that teachers' satisfaction with school resources has the most potential for improvement. The substantial disparity between resource satisfaction and cooperation implies that instructors are using peer assistance to the fullest extent possible to get around resource constraints. In addition to highlighting the tenacity of educators, this research indicates that more funding should be allocated to school resources to better facilitate their cooperative efforts.

In accordance with the research of Ascorra, Álvarez-Figueroa, and Queupil (2019), collaboration among educators inside the school enhances feelings of security and promotes well-being and a healthy lifestyle. A pleasant school climate correlates with increased adoption of programs and innovations among educational staff. Furthermore, Quines and Cabaron (2022) established that instructional innovation is essential for fostering a healthy school climate by promoting supportive and caring interactions.

Table 2 displays the leadership competence level, characterized by a standard deviation of 0.54 and a weighted mean of 4.32, which corresponds to a descriptive classification of Very High. This indicates that educators at the Department of Education, Region XII, see their school leaders as proficient in successfully directing, supporting, and executing technology integration efforts while exhibiting dynamic leadership in digital transformation inside their institutions.

Moreover, the findings demonstrate that all six indicators obtained a very high mean value, with the Social, Legal, and Ethical Issues Dimensions having the highest mean value of 4.35. Meanwhile, among the metrics, the Support, Management, and Operations Dimensions had the lowest average value of 4.30. This means that school leaders are very good at making and carrying out technology-focused strategic plans. They are also very good at understanding the moral, legal, and social effects of educational technology. In addition, school heads are also very good at using digital tools to do their jobs better and make it easier for technology to be used in the classroom. Moreover, they are very good at managing technical tools to make processes easier and using technology for assessing the whole school.

Table 2: Level of Leadership Competency

Indicators	SD	Mean	Descriptive Equivalent
Leadership and Vision Dimension	0.62	4.31	Very High
Learning and Teaching Dimension	0.59	4.31	Very High
Productivity and Professional Practice Dimension	0.60	4.31	Very High
Support, Management, and Operations Dimension	0.62	4.30	Very High
Assessment and Evaluation Dimension	0.61	4.31	Very High
Social, Legal, and Ethical Issues Dimensions	0.61	4.35	Very High
Overall	**0.54**	**4.32**	**Very High**

In consonance with the idea of Nailufar, Imaddudin, and Muttaqin (2023) that school heads should let teachers inspire one another to grow professionally in learning and be in charge of supervising and supporting teachers to improve the teaching-learning environment inside the classroom. Moreover, they are expected to be a dynamic consultant, preparing education and training that can assist teachers in completing their assignments through the use of technology. Quines and Monteza (2023) also agreed that the school head should know what to do, how to do it, and when to do it to offer possible technical support to the teachers who need it.

Table 3 displays the level of self-efficacy in technology, which has an overall weighted mean score of 4.20 and a standard deviation of 0.52, suggesting a descriptive equivalent of Very High. The average of the indicators runs from 4.17 to 4.23. This implies that educators at the Department of Education, Region XII, have a high level of confidence and competency in effectively integrating and using a variety of technological tools and resources in their teaching operations.

Table 3: Level of Self-Efficacy in Technology

Indicators	SD	Mean	Descriptive Equivalent
Technology Proficiency	0.60	4.17	High
Teacher Professional Development and Instruction	0.57	4.21	Very High
Emerging Technologies for Student Learning	0.61	4.23	Very High
Overall	**0.52**	**4.20**	**Very High**

Additionally, the findings reveal that two indicators had very high mean values: the highest mean score, 4.23, was obtained by Emerging Technologies for Student Learning. In contrast, Technology Proficiency had the lowest mean score of the three indicators, 4.17, and the descriptive equivalent of High. Teachers, therefore, demonstrate high professionalism in employing new technology for student learning and a strong commitment to professional development in technological integration.

The research of Pan (2020), which concentrated on the self-efficacy of teachers in technology, supports this point of view by underlining the need for teachers at all levels to know the influence of technological self-efficacy on student learning. Apart from knowledge, efficient technology integration for education depends on good teacher efficacy. In addition, Del Valle and Guhao (2024) have proved that teachers who possess high levels of self-efficacy are more likely to establish a positive rapport with their students and effectively manage a variety of student behaviors in the classroom.

The weighted averages of each indicator of attitude toward technology are presented in Table 4. The general weighted mean is 3.90, with a standard deviation of 0.40 and a descriptive interpretation of High. The mean of the indicators is between 2.74 and 4.60. This implies that public school educators in Region XII are generally optimistic and amenable to incorporating technology into their instruction. However, there may still be room for teachers to be more enthusiastic about and open to technology.

Table 4: Level of Attitude Towards Technology

Indicators	SD	Mean	Descriptive Equivalent
Belief	0.50	4.60	Very High
Anxiety	0.06	2.74	Moderate
Implementation	0.60	4.36	Very High
Overall	**0.40**	**3.90**	**High**

Based on the data, Belief has the best mean score, at 4.60, which means it is Very High. This shows that teachers have very strong beliefs about how important and useful technology is in the classroom. Anxiety, on the other hand, had the lowest mean number, at 2.74, which meant it was moderate. It means that they are worried or uncomfortable about using technology at work.

These findings are congruent with Ersoy and Kavaklioglu's (2020) study, which found that teachers' opinions about the use of technology in the classroom are heavily impacted by how simple they perceive specific gadgets and applications to use. According to Torrato, Prudente, and Aguja (2020), a high degree of technology adoption among teachers is a sign of a favorable attitude toward the use of technology in the classroom. Thus, the existing technology curriculum at the school must be strengthened and improved.

Table 5 presents the results of the test of the correlation between attitude towards technology and school climate. Examining the correlation at a 0.05 significance level helps one to understand the theory. With a p-value less than 0.05, the overall r-value of .449 proved the null hypothesis was rejected. Attitudes toward technology and school climate indicate a strong relationship. This suggests that the surroundings of schools define the attitude toward technology.

Table 5: Significance of the Relationship between School Climate and Attitude Towards Technology

School Climate	Attitude towards Technology			
	Belief	Anxiety	Implementation	Overall
Collaboration	.557* (0.000)	-.116* (0.020)	.589* (0.000)	.425* (0.000)
Student Relations	.299* (0.000)	-.040 (0.422)	.468* (0.000)	.325* (0.000)
School Resources	.234* (0.000)	.019 (0.710)	.337* (0.000)	.285* (0.000)
Decision Making	.353* (0.000)	.014 (0.787)	.403* (0.000)	.362* (0.000)
Instructional Innovation	.508* (0.000)	-.078 (0.118)	.469* (0.000)	.379* (0.000)
Overall	**.482* (0.000)**	**-.044 (0.381)**	**.568* (0.000)**	**.449* (0.000)**

*Significant at 0.05 significance level.

More specifically, the result reveals that Collaboration emerges as the most influential school climate factor, showing strong positive correlations with technology implementation with an r-value of 0.589, belief in technology with an r-value of 0.557, and overall attitude towards technology with an r-value of 0.425. Notably, collaboration is the only factor showing a significant negative correlation with technology anxiety, with an r-value of -0.116, suggesting that collaborative environments might help reduce teachers' technology-related stress. Instructional Innovation also demonstrates substantial positive relationships, particularly with beliefs about technology, with an r-value of 0.508, and implementation, with an r-value of 0.469. Student Relations and Decision-making both show moderate positive correlations with technology implementation and beliefs, while School Resources, though still significant, display the weakest positive correlations among the climate factors. The anxiety dimension generally shows weak and non-significant correlations across most school climate factors, except for the aforementioned relationship with collaboration. This aligns with the results of Raygan and Moradkhani (2022), which showed a substantial correlation between school atmosphere and teachers' attitudes toward technology. A supportive and creative educational environment promotes instructors' adoption and successful integration of technology in their instructional methods.

Table 6 shows the findings of the test of the correlation between attitude toward technology and leadership competency. The association was examined at a 0.05 significance level, as the hypothesis represented. With a p-value less than 0.05, the total r-value of .324 indicated the null hypothesis was refuted. This demonstrates that there is a significant connection between leadership competence and attitude toward technology. This means that a person's attitude toward technology is connected to their level of leadership competency.

Table 6: Significance of the Relationship between Leadership Competency and Attitude Towards Technology

Leadership Competency	Attitude towards Technology			
	Belief	Anxiety	Implementation	Overall
Leadership and Vision Dimension	.506* (0.000)	-.128* (0.011)	.483* (0.000)	.341* (0.000)
Learning and Teaching Dimension	.400* (0.000)	-.032 (0.529)	.401* (0.000)	.341* (0.000)
Productivity and Professional Practice Dimension	.435* (0.000)	-.149* (0.003)	.428* (0.000)	.265* (0.000)
Support, Management, and Operations Dimension	.403* (0.000)	-.138* (0.006)	.378* (0.000)	.236* (0.000)
Assessment and Evaluation Dimension	.453* (0.000)	-.134* (0.007)	.407* (0.000)	.276* (0.000)
Social, Legal, and Ethical Issues Dimensions	.433* (0.000)	-.126* (0.011)	.413* (0.000)	.277* (0.000)
Overall	**.491* (0.000)**	**-.133* (0.008)**	**.469* (0.000)**	**.324* (0.000)**

*Significant at 0.05 significance level.

More specifically, the result reveals that Leadership and Vision emerge as the strongest dimension, showing substantial positive correlations with beliefs about technology with an r-value of 0.506 and technology implementation with an r-value of 0.483. All leadership dimensions demonstrate consistent positive correlations with technology beliefs and implementation, with correlation coefficients ranging from approximately 0.378 to 0.506. Interestingly, most leadership dimensions show small but significant negative correlations with technology anxiety, suggesting that stronger leadership competencies might help reduce technology-related stress among staff. The Productivity and Professional Practice dimension shows the strongest negative correlation with anxiety with an r-value of -0.149, while Learning and Teaching is the only dimension not significantly correlated with anxiety. These findings suggest that strong leadership competencies, particularly in vision-setting and instructional leadership, are associated with more positive attitudes towards technology and better technology implementation in educational settings while potentially helping to mitigate technology-related anxiety.

These concepts resemble the research of Efeoğlu and Çoruk (2019), which demonstrated a favorable association between leadership competence and teachers' attitudes toward technology. School leaders must execute their leadership responsibilities to understand, use, and embrace technology. A’mar and Eleyan (2022) affirmed that leadership is the main factor in the successful application of technology in educational institutions.

Table 7 shows the findings of the test of the correlation between attitude towards technology and self-efficacy in technology. The association was examined at a 0.05 significance level, as the hypothesis represented. With a p-value less than 0.05, the total r-value of 0.428 indicated the null hypothesis was rejected. Self-efficacy in technology and attitude toward technology thereby show a clear correlation. Therefore, attitude toward technology is associated with self-efficacy in technology.

Table 7: Significance of the Relationship between Self-Efficacy in Technology and Attitude Towards Technology

Self-Efficacy in Technology	Attitude towards Technology			
	Belief	Anxiety	Implementation	Overall
Technology Proficiency	.471* (0.000)	-.063 (0.209)	.482* (0.000)	.383* (0.000)
Teacher Professional Development and Instruction	.552* (0.000)	-.166* (0.001)	.571* (0.000)	.370* (0.000)
Emerging Technologies for Student Learning	.448* (0.000)	-.067 (0.179)	.499* (0.000)	.379* (0.000)
Overall	.553* (0.000)	-.110* (0.028)	.584* (0.000)	.428* (0.000)

*Significant at 0.05 significance level.

More specifically, the result reveals that Teacher Professional Development and Instruction show the strongest relationships with both beliefs with r-value of 0.552 and implementation with r-value of 0.571, while also demonstrating a significant negative correlation with anxiety with r-value of -0.166. Technology Proficiency and Emerging Technologies for Student Learning both show moderate positive correlations with beliefs and implementation but no significant relationship with anxiety. These findings suggest that higher levels of technology self-efficacy, particularly in professional development and instructional areas, are associated with more positive attitudes towards technology and better implementation practices in educational settings.

Furthermore, proven by Clipa, Delibas, and Mâță (2023) is the favorable relationship between self-efficacy in technology and teacher attitude toward it. Therefore, if self-efficacy shows strong positive values, instructors in the classrooms have more likelihood of using technology; and vice versa. Therefore, if views are favorable, instructors in the classroom are more inclined to employ technology; and vice versa. Fredeluces, Garcia and Quines (2023) agreed that technology had improved students' ability to grasp this content and allowed more knowledge to be conveyed in a shorter time.

Table 8 presents the estimates of variable regression weights in Path Analysis Model 1. The relationship between School Climate and Leadership Competency demonstrated a significant regression, with a p-value below 0.001. This route indicates that each unit increase in the school climate is associated with a 0.696-unit rise in leadership competence, with a standard error of 0.042. Self-efficacy in Technology, in conjunction with Leadership Competency, exhibited a regression with a p-value below 0.001. Each unit improvement in Self-efficacy in Technology is associated with a 0.184-unit increase in leadership competency.

Also, Leadership Competency to Attitude toward Technology showed a significant regression with a p-value less than 0.001; so, every unit increase in leadership competency corresponds to a.103 rise in Attitude toward technology with a p-value of.007. Lastly, the analysis of Self-efficacy in Technology concerning Attitude Towards Technology demonstrated a significant regression with a p-value of less than 0.001. This indicates that for every unit increase in Self-efficacy in Technology, there is a corresponding increase of 0.270 in Attitude Towards Technology.

Table 8: Estimates of Variable Regression Weights in Path Analysis Model 1

			B	S.E.	C.R.	BETA	P
Leadership Competency	<---	SchoolClimate	.696	.042	16.428	.642	***
Leadership Competency	<---	SelfEfficacyInTechnology	.184	.041	4.520	.176	***
Attitude Towards Technology	<---	LeadershipCompetency	.103	.038	2.685	.141	.007
Attitude Towards Technology	<---	SelfEfficacyInTechnology	.270	.040	6.775	.355	***

Note: Chi-square = 29.646, Degrees of freedom = 1, Probability level = .000.

School climate and leadership competency have shown a statistically significant correlation, according to studies. Additionally, strongly related to leadership competency is self-efficacy in technology. Furthermore, highly correlated with attitude toward technology are technological leadership competency and self-efficacy.

Table 9 illustrates the significant regression with a p-value less than 0.001 indicated by school climate to leadership competency based on the estimates of variable regression weights in Path Analysis Model 2. This route shows that, with a standard error of.042, every unit change in school climate correlates to a.696-unit rise in leadership competency. At the same time, Self-efficacy in technology to leadership competency gained a regression of .184 with a standard error of .041, Leadership competency to Attitude towards Technology obtained -.009 regression and a standard error of .048 with a p-value of .850. There was also a significant relationship between school climate and attitude toward technology, with a p-value less than 0.001. This means that each unit rise in School Climate equates to a.363-unit increase in Attitude Toward Technology.

Table 9: Estimates of Variable Regression Weights in Path Analysis Model 2

			B	S.E.	C.R.	BETA	P
LeadershipCompetency	<---	SchoolClimate	.696	.042	16.428	.642	***
LeadershipCompetency	<---	SelfEfficacyInTechnology	.184	.041	4.520	.176	***
AttitudeTowardsTechnology	<---	LeadershipCompetency	-.009	.048	-.189	-.012	.850
AttitudeTowardsTechnology	<---	SchoolClimate	.363	.052	6.937	.458	***

Note: Chi-square = 27.660; Degrees of freedom = 1; Probability level = .000

It has been shown that school climate and leadership competency have a statistically significant link. Furthermore, self-efficacy in technology is significantly related to leadership competency, as are school climate and attitude toward technology. However, under this paradigm, there is no substantial association between leadership competency and attitude toward technology.

Table 10 illustrates the significant regression with a p-value less than 0.001 shown by the School Climate and Leadership Competency from the Estimates of Variable Regression Weights in Path Analysis Model 3. This route shows that, with a standard error of.042, every unit rise in school climate correlates to a.696-unit increase in leadership competency. While Self-efficacy in Technology to Attitude Towards Technology gained a regression of .201 with a standard error of .039, School Climate to Attitude Towards Technology obtained a .245 regression and a standard error of .040. Furthermore, showing a significant regression with a p-value less than 0.001 was self-efficacy in technology to leadership competency. This means that a unit improvement in self-efficacy in technology equates to a.184-unit increase in leadership competency.

Table 10: Estimates of Variable Regression Weights in Path Analysis Model 3

			B	S.E.	C.R.	BETA	P
LeadershipCompetency	<---	SchoolClimate	.696	.042	16.428	.642	***
AttitudeTowardsTechnology	<---	SelfEfficacyInTechnology	.201	.039	5.164	.264	***
AttitudeTowardsTechnology	<---	SchoolClimate	.245	.040	6.040	.309	***
LeadershipCompetency	<---	SelfEfficacyInTechnology	.184	.041	4.520	.176	***

Note: Chi-square = 1.878; Degrees of freedom = 1; Probability level = .171

According to the statistics, school climate and leadership competency show a statistically significant correlation. Furthermore, highly correlated with attitude toward technology are self-efficacy in technology and school climate. Furthermore, strongly correlated with leadership competency is technological self-efficacy.

The summary of the Goodness of Fit Measures for the three Path Analysis Models is presented in Table 11. The analysis indicates that the data collected yielded a Chi-Square/Degrees of Freedom model fit value of 29.646 for model 1, 27.660 for model 2, and 1.878 for model 3. The P-value showed a model fit value of .000 for both model 1 and model 2, while model 3 had a value of 0.171. Additionally, the Normed Fit Index recorded model fit values of .949 for model 1, 0.952 for model 2, and 0.997 for model 3.

Additionally, the Tucker-Lewis Index yielded a model fit value of.700 for model 1,.721 for model 2, and.991 for model 3. The Comparative Fit Index yielded a model fit value of.950 for model 1,.954 for model 2, and.998 for model 3. The Goodness of the Fit Index yielded a model fit value of.965 for model 1, 0.968 for model 2, and 0.998 for model 3.

The RMSEA-Root Means Square of Error Approximation yielded a model fit value of.268 for model 1,.258 for model 2, and.047 for model 3. The model fit value of the Index P-Close Fit is.000 for model 1,.000 for model 2, and.364 for model 3. The results indicated that model 3 was the only one of the three path analysis models to consistently exhibit an exceptional fit to the data, as indicated by the indices. Consequently, it is designated as the best path model.

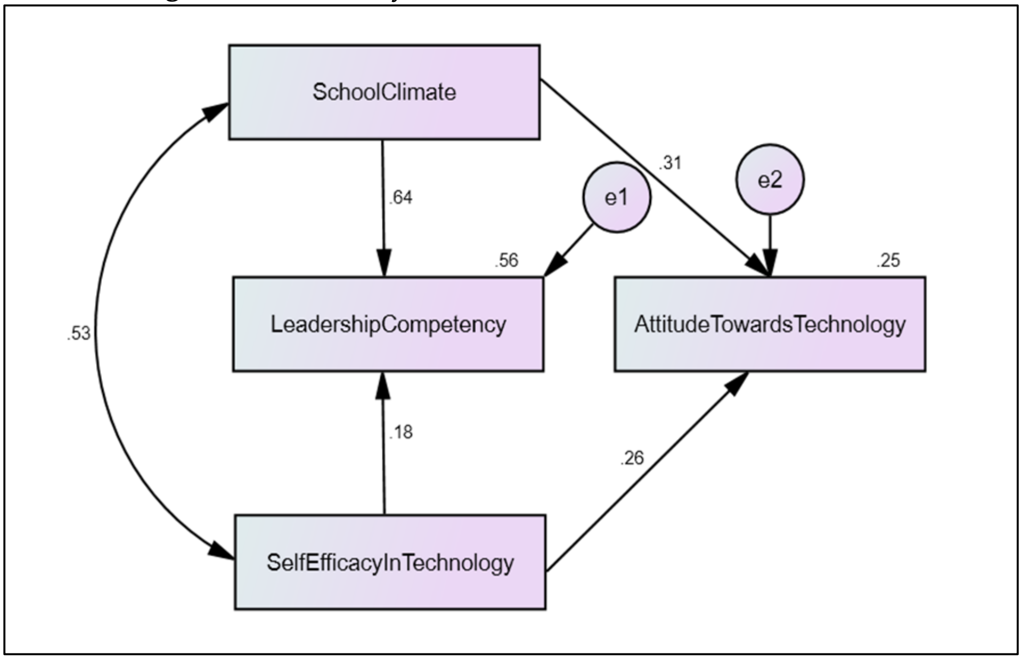
Table 11: Summary of Goodness of Fit Measures of the Three Path Analysis Models

Model	CMIN/DF 0<value<2	P-Value > .05	NFI > .95	TLI > .95	CFI > .95	GFI > .95	RMSEA < .05	P-Close > .05
1	29.646	.000	.949	.700	.950	.965	.268	.000
2	27.660	.000	.952	.721	.954	.968	.258	.000
3	1.878	.171	.997	.991	.998	.998	.047	.364

4.1 Best Fit Path Model

Figure 4 displays the Standardized Solution Path Analysis Model 3. This section offers an evaluation of model fit and an investigation of the interactions among the variables of the research.

Figure 4: Path Analysis Model 3 in Standardized Solution



Legend: SchoolClimate = School Climate; LeadershipCompetency = Leadership Competency; SelfEfficacyInTechnology = Self-Efficacy in Technology; AttitudeTowardsTechnology = Attitude towards Technology

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Figure 4 shows a 25 percent variation in attitude toward technology, explained by the combined effect of school climate, leadership competency, and self-efficacy in technology. Conversely, 56 percent of the variation in leadership competency may be ascribed to the combined effect of self-efficacy in technology and the school climate. Furthermore, greatly influencing attitudes towards technology with a p-value less than 0.05 are school climate beta with a value of 0.31 and self-efficacy in technology beta with a value of 0.26. Furthermore, with a p-value less than 0.05, school climate has a beta of 0.64, and self-efficacy in technology has a beta of 0.18, substantially predicting leadership competency. Finally, with a p-value of less than 0.05, school climate and self-efficacy in technology had a beta with a value of 0.53 notably predicting each other.

5. Recommendations

Thus, informed by the above data and pertinent observations, the following recommendations were made:

The school heads might be models of excellence in technology integration through regularly upgrading their abilities and creating a cooperative climate that supports teacher-led tech projects. By funding experiments with new teaching tools and creating initiatives using technology to improve student involvement and individualized learning, they should foster instructional innovation. Crucially, constant evaluation and improvement of school technology resources as well as guaranteeing fair access. School heads may plan frequent Learning Action Cell meetings, include teachers in choices pertaining to technology, and assist outside professional development prospects. Lastly, they may regularly track and assess how technology integration affects student learning results by means of data, therefore guiding ongoing technological usage throughout the school.

Teachers may investigate advanced applications and share knowledge with others. Staying current with developing educational technology depends on constant learning via chances for professional growth. Using creative ideas means working on tech-enhanced teaching strategies and trying out fresh approaches to include technology in courses. They may create personal objectives, practice often, and join professional learning networks centered on educational technology in order to improve their competency. Teachers may evaluate their use of technology, get comments, and keep updated on ethical issues so that they may set good examples for their pupils. To address the anxiety in technology integration, teachers may establish a support system and supportive learning environment that encourages the gradual use of technology in school.

This study might be a useful reference point for future studies looking for factors influencing attitudes toward technology in education. Though the conceptual framework may be used generally, local settings and cultural elements will probably affect the particular outcomes, even if otherwise. Any researcher extending this study should, therefore, give much thought to how their particular environment could affect results, thereby generating either fresh insights or alternative findings that help to further our knowledge of technology in education.

6. Conclusion

The findings suggest that among public elementary school teachers, school climate, self-efficacy in technology, and leadership competency have significant correlations to attitudes toward technology. The tables included in the discussion of the results and important discoveries show these connections and interactions. This leads one to conclude that how schools create an open and cooperative environment, how teachers boldly include technology in their lessons, and how their school head leads, guides, and supports them in using technology define the attitude of public elementary school teachers toward technology.

Additionally, the extremely high degree of school climate suggests that they highly agree that their school integrates technology in a favorable environment. Furthermore, their school head has a high degree of leadership ability. Out of its six indicators, all of them obtained high. This indicates that their school head exhibits extraordinary leadership in all spheres, therefore reflecting good technology leadership in the scene of education. On the other hand, their degree of technological self-efficacy is high among the teachers. This implies that at the same time as still retaining great competency in general technology usage, teachers have great confidence in their capacity to utilize technologies effectively, especially in utilizing new technologies for student learning and personal and professional growth. Furthermore, the degree of technological attitude among the primary instructors is high. Though they still have some mild apprehension about its usage, public elementary school teachers have a good attitude toward technology, strongly believe in its worth, and are ready to apply it. Furthermore, after examining the data and selecting the best-fit model for predicting teachers' attitudes toward technology using the Path Analysis Model, it was discovered that Model 3 met all of the conditions, making it the most fitting model.

Consequently, the findings of this research confirm one of the theories on the use of technology—the Technology Acceptance Model created by Davis (1989). It has evolved to become a basic paradigm for understanding determinants of human behavior toward either acceptance or rejection of technology. It suggests that a person's inclination to embrace technology is mostly influenced by perceived ease of use and perceived usefulness.

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Conflict of Interest Statement

The authors declare no conflicts of interest.

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