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The Relationship between Instructional Leadership, Educational Technology Integration, and Academic Achievement of Key Stage 2 Learners

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Abstract: This study examined the academic achievement of key stage 2 learners and the relationship between principal instructional leadership, educational technology integration, and student performance in the district of Salvador Benedicto. Using a cross-sectional, descriptive-correlational quantitative research design, data were collected teachers through validated questionnaires measuring instructional leadership, Technological Pedagogical Content Knowledge (TPACK), and students' achievement levels. Descriptive statistics and correlation analysis were employed to evaluate the relationships among variables. The findings revealed a very high positive correlation between principal instructional leadership and educational technology integration, indicating that strong leadership significantly supports teachers in effectively integrating technology into instruction. Conversely, the correlation between principal instructional leadership and students' academic achievement was weak and statistically insignificant, suggesting that leadership alone does not directly ensure higher student performance. Analysis of student achievement showed that the majority of Grade 4-6 students attained satisfactory to very satisfactory levels, with only a small proportion achieving outstanding performance. These findings highlight the critical role of instructional leadership in facilitating technology use among teachers while emphasizing the need for additional strategies, interventions, and professional development to enhance students' academic outcomes. The Instructional Leadership and Technology Integration Enhancement Program (ILTEP) for key stage 2 learners was created as a result of the study.

Keywords: Principal Instructional Leadership, Educational Technology Integration, Academic Achievement of key stage 2 learners, TPACK, Salvador Benedicto District, Quantitative, Cross-sectional, Descriptive–correlational Design.

CHAPTER 1

INTRODUCTION

Background of the Study

Education is globally recognized as a key factor in national development, with student academic performance serving as an essential indicator of school quality (UNESCO, 2021). across international research, two critical elements consistently emerge as drivers of effective teaching and learning: instructional leadership (Hallinger 2020) and the integration of educational technology (Bond 2021).

Internationally, instructional Leadership has long been seen as a core component of successful schools. Hallinger & Wang (2020), emphasizes three dimensions: (1) Defining the school's

mission, (2) managing the instruction program, and (3) promoting a positive school learning climate. Updated studies by Hallinger (2020) show that principals who practice strong instructional leadership provide clear expectations, support teacher development, monitor learning, and create a school culture that prioritizes academic achievement.

Recent scholarship reaffirms and refines Hallinger's model in light of decades of empirical research. In a comprehensive systematic review, Hallinger et. al (2025) examined 791 studies using the Principal Instructional Management Rating Scale (PIMRS) from 1983 through 2024, across more than 65 countries. Their findings show that while simpler (uni-variate) conceptual models still dominate, more advanced multivariate models – such as mediated or moderated effects – are increasingly being used, which could deepen understanding of how instructional leadership influences outcomes.

In parallel, the rise of educational technology in recent years emphasizes the role of teachers' capability. International studies, such as those by Bond (2021), and Starkey (2022), show that students achieve higher levels of learning when teachers use technology to support deep, meaningful tasks rather than digital substitution. In Asia, instructional leadership research has grown significantly over the past three decades, Hallinger et al. (2025) conducted a state-of-art review of Asian studies from 1987 to 2024, revealing a substantial increase in publications and improved methodological sophistication. Asian researchers are increasingly investigating contextual factors that moderate leadership effects, such as school culture, resource availability, and teacher capacity.

Similarly, regional research shows strong evidence for the effectiveness of TRACK-based instruction. Cui et al. (2023) found that Asian learners in basic education achieve better performance in mathematics, reading, and science when teachers apply TPACK principles effectively. This confirms the essential role of both technology skills and pedagogical knowledge in improving student learning with in developing Asian educational system.

In the Philippines, the Department of Education (DepEd) continues to strengthen both school leadership and digital learning initiatives through policies, training, and programs, and ICT integration efforts. However, challenges persist, particularly in rural and geographically isolated areas such as, inconsistent technology access, limited ICT infrastructure, uneven teacher readiness in technology use, and varied leadership practices among school heads.

The District of Salvador Benedicto experiences similar challenges on a more localized scale. Grades 4 to 6 teachers increasingly use educational technology to enhance instruction, making the TPACK framework highly relevant to their teaching needs. Yet, the district faces resource limitations, varying teacher technological skills, and differences in how principals carry out instructional leadership.

Moreover, recent literature such as Yang et al. (2025) emphasizes that principals' technology leadership, providing digital resources, modelling technology use, and supporting teacher ICT training significantly influences teachers' adoption of educational technology. This highlights the need to examine how school leaders in Salvador Benedicto support technology-enhanced instruction among teachers.

Despite the acknowledged role of instructional leadership and educational technology in improving teaching and learning, there is limited localized evidence on how these factors interact to affect student outcomes. Research has mostly examined them separately, and rural, resource-constrained settings face challenges such as inconsistent leadership, uneven teacher technology readiness, and limited digital resources. In the District of Salvador Benedicto, no study has systematically explored the relationship between principals' instructional leadership, teachers' technology integration, and Grades 4–6 academic achievement, limiting evidence-based strategies to enhance instructional supervision, technology use, and student learning outcomes.

Review of Related Literature

This chapter presents a review of related literature and studies that support the present research. It examines existing works on instructional leadership, educational technology integration, and learners' academic achievement to establish the study's theoretical foundation, identify research gaps, and situate the investigation within current educational research.

Instructional Leadership

Instructional leadership is widely recognized as a key factor shaping teacher performance and, indirectly, student achievement. Papadakis et.al. (2024) conducted a meta-analytic structural equation modeling (MASEM) study synthesizing 60 empirical studies using the Leadership for Learning (LfL) framework, which integrates instructional, transformational, and distributed leadership. Their findings indicate that while leadership positively affects teacher performance, the impact on student achievement is largely mediated through teacher performance. This suggests that principals' influence on student outcomes occurs primarily via the enhancement of teacher effectiveness.

Instructional leadership also predicts other teacher-related outcomes, including professional development participation, motivation, and job satisfaction. Rachmad et. al. (2023) reported that principals' instructional leadership explained 54.1% of the variance in teacher performance, and when combined with teachers' professional competence, accounted for 78.4%. These results underscore the importance of instructional leadership as a driver of teacher quality and, consequently, student learning. This suggests that principals influence learning not so much by direct action on students but by improving teacher effectiveness. The study provides strong support for the notion that teacher performance is a critical mediating variable in the relationship between principal leadership and student outcomes.

He Guo, & Abazie (2024) reported that principals' instructional leadership practices predicted teachers' professional development activities and teacher quality indicators in Nigerian schools, implying that principals effect student outcomes via teacher improvement. Principal leadership behaviors (relationship building, task structuring, and positional power/use of authority) positively influenced teacher performance, which in turn correlated with student achievement. (Pardosi & Utari, 2022)

Teacher self-efficacy mediates the relationship between instructional leadership and performance outcomes. Meta- analytic evidence indicates that collective teacher efficacy strengthens the link between principals' leadership and student outcomes (Karakose, 2024). Other studies confirm that principals' instructional behaviors, such as goal-setting, classroom supervision, and feedback, positively influence teachers' confidence and engagement in professional learning (Guo et al. 2024).

Evidence indicates that principals' instructional leadership positively influences teacher performance, professional development participation, and self-efficacy, which in turn affect student achievement (He, et al. 2024). These findings suggest measuring not only principals' instructional leadership behaviors (goal setting, monitoring instruction, but also teacher-level mediators (teacher performance, professional development participation, self-efficacy) when examining links to Grade 4-6 achievement. These leadership dimensions create an environment conducive to effective teaching and learning. Local empirical evidence, particularly for rural primary schools, is limited, underscoring the importance of the present study in Salvador Benedicto for S.Y. 2025-2026.

Teachers' EdTech Integration

Recent research highlights the importance of principals as digital leaders, especially in the post-pandemic era. Rasdiana et al. (2024) investigated the effects of instructional e-supervision, technology leadership, and school digital culture on Teachers' Professional Digital Competence (TPDC). Their structural equation modeling analysis showed that principal technology leadership

positively influences both digital culture and teacher digital competence. Moreover, school digital culture mediated the relationship between leadership and teacher competence, indicating that principals' support for technology, combined with a strong digital culture, enhances teachers' digital skills.

Additionally, Zeng and Cheah (2025) examined how principals' digital leadership influences teachers' adoption of technology in education, combining transformational leadership with the Unified Theory of Acceptance and Use of Technology (UTAUT). They found that principals who provide vision, resources, and professional development opportunities enhance teachers' performance expectancy and self-efficacy for technology adoption. When instructional and digital leadership are combined, teacher is more likely to adopt technology meaningfully, with positive implications for students learning outcomes.

Systematic reviews indicate that EdTech effectiveness in primary education depends on the quality of implementation, frequency of use, and teacher preparedness. Valverde-Berrocoso et al. (2022) found that pedagogically aligned technology interventions improve student engagement, motivation, and learning outcomes; however, direct effects on standardized achievement scores are mixed. These findings highlight that leadership and teacher competence are crucial for successful technology integration.

Student Achievement

Student achievement in Grades 4-6 reflects foundational literacy, numeracy, and cognitive skills essential for future learning. It shows that learning outcomes at this level are strongly influenced by both instructional leadership and teachers' EdTech integration. A meta-analytic structural equation modeling (MASEM) study by Xanthopoulou, et al. (2024) found that Instructional Leadership (IL), along with transformational and distributed leadership, affects student achievement indirectly via teacher performance. Specifically, the (IL) effect on student achievement was mediated by teacher performance, suggesting that principals influence student learning mostly by influencing teacher effectiveness rather than directly producing gains.

Instructional leadership indirectly impacts Grade 4-6 achievement. Principals who provide clear instructional goals, classroom supervision, and professional development support enhance teaching quality, which translates into better student outcomes (Papadakis et al., 2024) further emphasize that instructional leadership promotes teacher professional growth, improving classroom practices that directly affect students' academic performance.

Teachers' integration of educational technology is increasingly critical in upper primary education. Valverde-Berrocoso et al. (2022) reported that when technology is used in alignment with curriculum goals, it enhances student engagement and learning outcomes in Grades 4 to 6. The study emphasized that students benefit from interactive, technology-supported instruction, which can improve understanding of complex concepts. According to Rasdiana et al. (2024), principals' leadership and the creation of a positive digital school culture significantly influence teachers' professional digital competence. In grades 4 to 6, teachers with higher digital competence can implement technology in meaningful ways, leading to improved student participation and achievement. Similarly, Zeng and Cheah (2025) noted that supportive leadership encourages teachers to integrate technology and other advance technologies, fostering enhanced learning experiences for upper primary students.

Student engagement emerges as a pivotal pathway linking both instructional leadership and technology integration to academic success. Xanthopoulou et al. (2024) found that instructional leadership indirectly influences student achievement by improving teacher performance, which likely enhances strategies that promote student engagement. Li et al. (2023) also demonstrated in Chinese primary schools that supervisory and developmental practices raise student engagement, which in turn improves achievement. Rodulfa (2022) reported that stronger school leadership and

higher teacher self-efficacy in blended teaching predict more interactive and engaging classroom experiences.

Synthesis

Instructional leadership plays a crucial role in shaping teacher performance and, indirectly, student achievement. Principals influence student outcomes primarily by improving teacher effectiveness rather than through direct interaction with students. Effective instructional leadership promotes professional development, teacher motivation, job satisfaction, and self-efficacy, all of which enhance teaching quality and create a conducive learning environment. Leadership practices such as goal-setting, classroom supervision, feedback, and relationship-building support teachers' growth and professional engagement, ultimately improving student outcomes.

The integration of educational technology by teachers is increasingly important in enhancing student learning, particularly in upper primary grades. Principals act as digital leaders by fostering a positive school digital culture, providing resources, professional development, and support development, and support technology adoption. When teachers are competent and confident in using technology, they can implement interactive and meaningful digital instruction that engages students and supports understanding of complex concepts. The combination of instructional and digital leadership encourages teachers to use technology effectively, promoting higher levels of student participation and achievement.

Student achievement in Grades 4-6 is strongly influenced by both instructional leadership and teachers' integration of educational technology. Leadership enhances teacher performance, which in turn affects teaching practices that engage students and improve learning outcomes. Technology integration supports interactive and curriculum-aligned instruction, fostering student engagement and deeper understanding of concepts. Student engagement serves as a key pathway linking effective leadership and technology use to academic success.

Despite evidence from international studies, research in rural Philippines contexts remains limited, especially regarding the combined effects of instructional and digital leadership on teacher practices and student outcomes. Challenges such as limited resources, varying teacher readiness, and inconsistent leadership highlight the need for local studies. Understanding how leadership and technology integration jointly influence student achievement can inform policies, professional development, and school practices, ultimately improving teaching quality and learning outcomes in the rural district.

Theoretical Framework

This study is anchored on multiple theoretical perspectives that collectively explain how principal instructional leadership, and teacher technology integration influence student achievement. These are Instructional Leadership Theory by Hallinger, 1985; updated in reviews 2021-2023, Technology Theory by Mishra & Koehler (2006), Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) by Venkatesh et al. (2003, 2012), and Blooms Mastery Learning Theory by Benjamin (1968). Together, these theories provide a comprehensive lens for examining the correlational relationships among instructional leadership, teacher EdTech integration, and student achievement.

Instructional leadership theory asserts that principal influence student outcomes indirectly by focusing on teaching and learning rather than managerial tasks. Hallinger (2003) described instructional leadership as setting clear goals, managing the instructional program, and promoting a positive school climate. Hallinger's Principal Instructional Management Rating Scale (PIMRS) provide most widely used conceptualized and measurement tool for instructional leadership. It emphasizes three domains: (a) defining the school's mission, (b) managing the instructional program, and (c) promoting a positive school learning climate (Hallinger, 1985; updated in reviews 2021-2023). recent studies affirm the relevance of instructional leadership in improving teacher practices and student outcomes. For example, Hallinger and Wand (2022) emphasized that

instructional leadership remains central to school improvement in 21st -century contexts. Similarly, Gumus et al. (2021) highlighted that PIMRS continues to be a dominant instrument for studying leadership internationally.

Research suggests that effective school leadership enhances technology integration which in turn influences student achievement. Principals create the conditions for EdTech use by providing professional development, monitoring, instruction, and allocating resources (Leithwood, and et al., 2004). In this study, principal's instructional leadership and teachers' EdTech integration are the inputs, teaching-learning practices as the process and learner's academic achievement is the output.

The use of technology in teaching is explained by the Technological Pedagogical Content Knowledge (TPACK) that effective integration of technology in education requires teachers to blend content knowledge and technological knowledge, according to the technology Integration Model (Mishra & Koehler, 2006). It highlights the need for teachers to integrate technology with content and pedagogy to achieve effective learning. Ertmer (2005) noted that teachers' beliefs, confidence and access to resources are critical determinants of successful technology integration. Recent studies affirm its validity in K-12 contexts. Chai et al. (2020) reviewed TPACK applications in primary schools, showing its utility for measuring teachers' readiness to integrate technology. More recently Willermart and Pareto (2021) confirmed that TPACK provides a solid lens for evaluating teachers' digital competence. This means that teachers' TPACK levels reflect how effectively they can design learning activities using EdTech tools, which in turn affects pupils' achievement.

The Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) extend the original UTAUT model by Venkatesh et al. (2003, 2012) and incorporates additional predictors such as hedonic motivation, price value, and habit. This model has been successfully applied in educational contexts to explain teacher and student adoption of new technologies. Siddiq et al. (2021) applied UTAUT2 in K-12 settings and confirmed the importance of performance expectancy and facilitating conditions for teachers' technology use. Similarly. Ain et al. (2022) found that social influence and habit significantly predicted EdTech adoption among teachers.

In summary, these theories collectively explain how instructional leadership and teacher technology integration influence student learning. Hallinger and Murphy (1985) highlight the principal's role in guiding instruction and fostering a positive learning environment, while the TPACK framework (Mishra & Koehler, 2006) emphasizes teacher' integration of technological, pedagogical, and content knowledge. Blooms Taxonomy ensures that instruction targets the appropriate cognitive levels, and the UTAUT2 model explains teachers' adoption of technology in the classroom. Together, these frameworks support the examination as key correlates of student engagement and achievement.

Conceptual Framework

Figure 1. *Conceptual Framework*

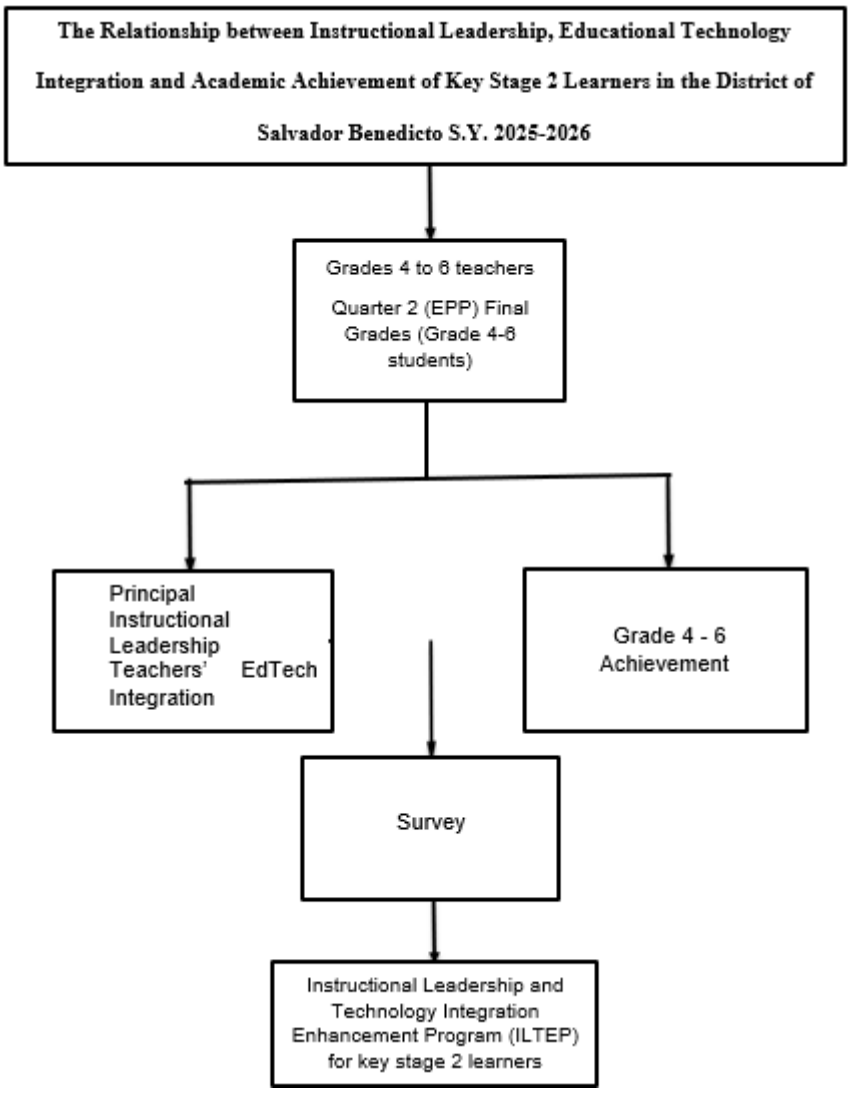

Figure 1 illustrates the conceptual pathway showing how principals' instructional leadership and teachers' educational technology (EdTech) integration collectively influence the academic achievement of Grade 4 to 6 learners. The diagram highlights that effective instructional leadership—characterized by clear goal setting, consistent monitoring of instruction, provision of feedback, and support for teacher development—creates school conditions that encourage high-quality teaching practices. When these leadership behaviors are present, teachers are more likely to integrate relevant digital tools, platforms, and resources into their instructional delivery.

Moreover, the figure underscores that EdTech integration serves as a critical mechanism through which instructional leadership affects student learning. As teachers adopt technology to enrich lessons, differentiate instruction, and provide timely feedback, learners are exposed to more engaging and interactive learning experiences, which can contribute to improved academic performance. Thus, the visual model positions EdTech integration not just as an isolated factor, but as an essential instructional component influenced by the principal's leadership actions.

The schematic diagram also emphasizes the importance of data-driven assessment within the school or district. By visually connecting leadership practices, technology use, and learner outcomes, the model assists stakeholders in identifying instructional gaps, aligning professional development programs, and strengthening school-wide strategies. This integrated perspective allows

administrators to make informed decisions regarding resource allocation, capacity building, and instructional improvement.

Ultimately, the enhanced model supports the development of evidence-based frameworks and policies aimed at elevating instructional leadership practices, improving technology-supported teaching, and boosting overall student achievement. It provides a clear foundation for analyzing how leadership and instructional innovations contribute to academic success, particularly within the context of the District of Salvador Benedicto.

Statement of the Problem

This study sought to determine the relationship between principal instructional leadership and teachers' EdTech on student achievement in Grades 4 to 6 in the District of Salvador Benedicto during School Year 2025-2026.

Specifically, it aims to answer the following research questions:

1. What is the level of school heads instructional leadership in the District of Salvador Benedicto during SY 2025–2026, as perceived by teachers, in terms of:

a. defining the school's mission;

b. managing the instructional program: and

c. developing a positive school learning climate?

2. What is the level of teachers' educational technology integration in Grades 4–6 classrooms in the District of Salvador Benedicto during SY 2025–2026, in terms of:

a. technological knowledge

b. pedagogical knowledge

c. content knowledge

d. TPACK-based classroom practice (planning, instructional use, assessment, classroom management, professional growth)?

3. What is the level of academic achievement of Grades 4–6 learners in the District of Salvador Benedicto during SY 2025–2026?

4. Is there a significant relationship in the principal instructional leadership and educational technology integration?

5. Is there a significant relationship between the principal instructional leadership and student achievement?

6. Based on the findings, what specific actionable framework can be provided to the administration of the District of Salvador Benedicto to enhance student achievement through principal instructional leadership and teachers' EdTech integration?

Hypotheses

Ho_AThere is a significant relationship in principals' instructional leadership, and educational technology integration.

Ho_1There is no significant relationship in the principal instructional leadership and student achievement.

Significance of the Study

The findings in this study provide a significant understanding and it is deemed beneficial to the following:

Department of Education (DepEd & Policy Makers). This study may serve as evidence to support policies on strengthening instructional leadership and digital initiatives.

School Principals. This result of the study will provide insights into how their instructional leadership practices directly or indirectly influence teachers' use of technology and pupils' performance.

Teachers. The study will highlight the importance of EdTech integration as a tool to enhance instructional practices.

Learners (Grade 4-6 pupils). The study benefits learners by improving the quality of teaching they receive.

Parents and Community. The finding may reassure parents that schools are maximizing leadership and technology to improve learning outcomes.

Future researchers. The study will add to the body of knowledge on leadership. Technology integration, and academic achievement.

Scope of the Study

This study focused on determining the extent to which principal instructional leadership and teachers' educational technology (EdTech) integration serve as correlates of Grade 4 to 6 learners' academic achievement in the District of Salvador Benedicto for School Year 2025-2026. The subject-respondents of this study were 82 teachers of the District of Salvador Benedicto who were officially teaching during the school year 2025-2026. The pupils' level of academic achievement was determined based on their average grades as reflected in official records in Quarter 2.

An adapted survey questionnaire, Principal Instructional Management Rating Scale (PIMRS) originally developed by Hallinger 1983 and the Technological Pedagogical Content Knowledge (TPACK) Framework developed by Mishra and Koehler (2006) will be employed by the researcher. The study is confined to identifying the extent of correlation among stated variables. The findings will only be applicable to public elementary schools within the District of Salvador Benedicto during the specified school year.

Definitions of Terms

For a clear understanding and to avoid confusion of the terms used in the study, the following terms are defined conceptually and/ or operationally.

Schools' Mission. Operationally, it is measured by reviewing the school's vision and mission statements, official school documents, and through interviews with school leaders regarding how these goals guide instructional and organizational practices.

Educational Technology (EdTech) Integration. Operationally, it includes the effective use of technological knowledge, pedagogical strategies, and instructional tools in classroom instruction to support student engagement.

Instructional Leadership. Operationally, it is measured through teachers' perceptions using a Likert-scale survey and includes the following dimensions: Defining the School's Mission, Managing the Instructional Program, and Developing A Positive School Learning.

Instructional Program. Operationally, it is measured through the preparation of lesson plans and instructional guides aligned with learning competencies, classroom observations and feedback, monitoring learner progress, and adjustments in instructional strategies.

Student Achievement. Operationally, it is measured using the students' Quarter 3 final grades in all core subjects, which reflect the students' mastery of the curriculum and learning.

School Learning Climate. Operationally, it is measured by learners' perceptions of classroom engagement, teacher-student relationships, and school support, using surveys, interviews, and classroom observation checklists.

Technological Pedagogical Content Knowledge (TPACK). Operationally, it is measured through the perceived extent of teachers' educational technology integration in Grades 4-6 classrooms.

CHAPTER 2

METHODOLOGY

This chapter introduces the methodological aspects of the study, encompassing the research design, respondents of the study, research instrument, data collection procedures, data analysis techniques, statistical treatment, and ethical considerations.

Research Design

This study employed a quantitative, descriptive-correlational research design. Descriptive-correlational design is a quantitative, non-experimental research design that serves two main purposes: (1) descriptive, describes the current status or characteristics of one or more variables as that naturally occur in a population and (2) correlational, it examines the relationships or associations between two or more variables to determine the strength and direction of their relationship with out manipulating them Creswell, J. W. (2021). A quantitative approach was chosen to obtain numeric measures of the key variables and to permit statistical testing of relationships. The cross-sectional nature of research means data were collected at a single point in time within the specified school year, providing a snapshot of leadership practices, EdTech integration, and student achievement without manipulation off variables.

The descriptive component characterizes the current levels of instructional leadership and EdTech integration, while the correlational component assesses the strength and direction of associations between these school-level factors and student achievement.

This design is appropriate because it allows the researcher to describe prevailing conditions across the district and to identify potential relationships that may inform school improvement efforts, policy, and future experimental or longitudinal studies. Data were collected from the target population of Grade 4-6 students, teachers, and school principals in District Salvador Benedicto, and analyzed using descriptive statistics and correlational techniques (e.g., Pearson's r), with significance tests set at an appropriate alpha level.

Respondents of the Study

The respondents of the study were teachers handling Grades 4 to 6 in the District of Salvador Benedicto during School Year 2025-2026. Purposive sampling was used in research studies. Purposive sampling is a non-probability sampling technique wherein participants are deliberately selected based on characteristics relevant to the research objectives. This method relies on the researcher's judgment in identifying information-rich cases rather than random selection (Nikolopoulou, 2023). It enables intentional selection of respondents whose experiences or attributes are relevant to the study, providing deeper insights into the phenomenon under investigation (Tajik, Golzar, & Noor, 2024)

Table 1. *Respondents of the study*

N=82

Grade Level	Number of Respondents	Percentage
Grade 4	30	36.585%
Grade 5	27	32.927%
Grade 6	25	30.488%
Total	82	100%

Research Instrument

To collect the data, the researcher employed two instruments to gather information on the variables of principal instructional leadership, teachers' EdTech integration, and Grade 4–6 student achievement in the District of Salvador Benedicto. The first instrument was a survey questionnaire administered to Grades 4–6 teachers, which assessed their perceptions of their principals' instructional leadership performance. This questionnaire was adapted from the Principal Instructional Management Rating Scale (PIMRS), a validated tool widely used in educational research. It contained Likert-scale items covering key dimensions of instructional leadership, including instructional supervision, professional development support, feedback provision, communication of academic expectations, and classroom monitoring. Teachers will provide responses based on their direct observations and experiences of their principal's leadership behaviors, and a slightly adopted a self-assessment survey questionnaire for Grades 4–6 teachers to measure the extent of educational technology integration. This tool was based on the Technological Pedagogical Content Knowledge (TPACK) framework, which evaluates teachers' competencies in integrating technology with pedagogy and content knowledge. Items assessed ICT competency, frequency of technology use, application of digital tools in lesson planning and instruction, and integration of technology-enhanced teaching strategies. A Likert-scale format will be employed to quantify teachers' self-reported proficiency and classroom application.

Validity and Reliability of Survey Questionnaires

The validity of the survey questionnaire was established through expert evaluation to ensure that the items appropriately measured the intended constructs. Three jurors reviewed the instrument and rated each item using a 5-point scale. The results showed high ratings across all indicators, with Juror 1 and Juror 2 obtaining a mean score of 4.67, and Juror 3 obtaining a mean score of 5.00. the overall mean validity rating of 4.78 was interpreted as Excellent, indicating strong agreement among the validators regarding the relevance, clarity and adequacy of the questionnaire items. This suggests that the instrument possesses satisfactory content validity and is appropriate for data collection. Therefore, the questionnaire was deemed valid and suitable for administration to the study respondents.

The reliability test yielded a Cronbach's Alpha of 0.954 for the 50-item instrument, indicating excellent internal consistency. This value suggests that the items in the questionnaire are highly reliable and consistently measure the intended constructs.

According to commonly accepted standards, a Cronbach's Alpha above 0.90 reflects very high reliability, demonstrating that the instrument is dependable for data collection and analysis. Therefore, the results confirm that the research instrument is suitable for assessing the variables of the study and that the responses obtained can be considered credible and consistent.

Data Collection Procedure

Before collecting the data, the researcher secured permission from the District Office of Salvador Benedicto and from the principals of the schools in the district to ensure that the study was conducted smoothly and ethically. Coordination with the principals and school heads ensured that the process did not interfere with regular teaching and learning activities.

The Grades 4–6 teachers, who served as the respondents for this study, were oriented about the purpose of the research. The researcher explained how the questionnaires were used, emphasized that participation is voluntary, and assured the respondents that their answers would remain confidential. The questionnaires were distributed either in printed form or online, depending on the accessibility and preference of the respondents. The researcher ensured that teachers have enough time to complete the questionnaires and clarified any concerns during the process.

The researcher collected the Quarter 2 final grades of the EPP subject in Grades 4-6 students from school records. These records were obtained with proper approval from the school principals and teachers to ensure the accuracy and reliability of the data.

Data Analysis Procedure

After collecting all completed questionnaires, the researcher analyzed the data using frequency, percentage, and mean to describe the extent of principal instructional leadership, measured using the PIMRS questionnaire, and teachers' educational technology integration, measure using the TPACK questionnaire.

Pearson r was applied to examine the relationship between variables, while multiple regression analysis determines their combine and individual effects on Grade 4-6 student achievement (Q2, EPP), with assumptions of linearity, normality, homoscedasticity, and VIF < 5 checked for validity.

Statistical Treatment

Statistical treatment of data is necessary to utilize the data in the appropriate format. The gathering of raw data is simply one part of an experiment. In order to get the right conclusions, data organization is equally crucial. The following statistical procedures were used to analyze the data gathered from the teachers and to answer the research questions of this study.

1. Frequency. The number of times a particular response, value, or observation occurs in a dataset. In research and statistics, it shows how often each category or answer appears among respondents. It is commonly used in tables to summarize data, such as the number of participants who selected a specific response option.

2. Frequency. The number of times a particular response, value, or observation occurs in a dataset. In research and statistics, it shows how often each category or answer appears among respondents. It is commonly used in tables to summarize data, such as the number of participants who selected a specific response option.

3. Weighted Mean. The result of the survey was analyzed using the weighted mean with the following formula:

$$WM = \frac{\sum FM}{N}$$

Where:

WM = Weighted mean

Σ = Summation symbol

F = Frequency for each response category

W = Assigned weight

N = Total number of frequencies

4. Likert Scale. The following Likert Scale is used to quantify teachers' perceptions of principal instructional leadership and their educational leadership and their educational technology integration.

Table 2. *Interpret the data gathered in the survey*

Scale	Weighted Means/ Equivalent	Corresponding Remarks
5	4.21-5.00	Strongly Agree
4	3.61-4.20	Agree
3	2.41-3.60	Neutral
2	1.81-2.40	Disagree
1	1.00-1.80	Strongly Disagree

5. The frequency and percentage distribution were used to determine how many students fall within each grading category based on their **official grades of Quarter 2, EPP subject**. This treatment helps describe the distribution of student achievement levels. Students are grouped into grading categories based on the district or school grading scale (e.g., Outstanding, Very Satisfactory, Satisfactory, Fair, Needs Improvement). This allows the researcher to identify the achievement level distribution for each subject.

Table 3. *Interpret the data gathered in official grades of Grades 4-6 students*

Scale	Mean Range	Rating Range	Corresponding Remarks
5	4.21-5.00	91-100	Outstanding
4	3.61-4.20	86-90	Very Satisfactory
3	2.41-3.60	81-85	Satisfactory
2	1.81-2.40	76-80	Fairly
1	1.00-1.80	Below 75	Needs Improvement

3. Pearson Product–Moment Correlation. Pearson's r was used to determine the strength and direction of the relationship between: principal instructional leadership and student achievement, and teachers' educational technology integration and student achievement.

Formula:

$$r = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2]\,[n\sum y^2 - (\sum y)^2]}}$$

Where:

- r = Pearson correlation coefficient
- n = number of paired scores
- x = values of the first variable
- y = values of the second variable
- $\sum xy$ = sum of the products of paired scores
- $\sum x$ = sum of the x scores
- $\sum y$ = sum of the y scores
- $\sum x^2$ = sum of the squares of the x scores
- $\sum y^2$ = sum of the squares of the y scores

Ethical Considerations

This study observes the highest standards of ethical conduct to protect the rights, privacy, and ell-being of all participants. The following ethical practices will be considered:

Permission was secured from the district office/School Principal to allow the researcher to conduct a survey on the grade 4-6 teachers, and grade 4-6 students.

Informed consent, teachers are informed about the purpose, objectives, and procedures of the research. They are assured that participation is voluntary, and they may withdraw at any time without any negative consequences.

The responses collected from the teachers and the final grades of the students are treated with strict confidentiality. No personal identifiers, such as names or specific schools, are published or disclosed. Data are coded and analyzed in aggregate form to ensure participants' anonymity.

The researcher provides accurate and truthful information regarding the study's objectives, procedures, and intended use of the data. Findings are reported objectively without fabrication, falsification, or misrepresentation.

Collected data are used solely for research purposes and for the fulfillment of the requirements of the study. Participants are informed that the results may be shared in academic reports, presentations, or publications, while maintaining confidentiality.

CHAPTER 3

RESULTS AND DISCUSSION

This chapter presented and discuss the results of the study on principal instructional leadership, educational technology integration, and the academic achievement of Key Stage 2 learners in the District of Salvador Benedicto. The findings are analyzed in relation to existing literature to highlight key patterns, relationships, and implications for teaching and learning.

Table 4. Level of School Heads Instructional Leadership as Perceived by Teachers in Terms of:

Defining the School's Mission

ITEMS	STRONGLY AGREE	AGREE	NEUTRAL	AGREE	STRONGLY DISAGREE	MEAN	INTERPRETATION
The principal ensures that teachers understand the school's vision and mission.	36	40	6	0	0	4.85	SA
The principal involves teachers setting school-wide academic objectives.	46	27	8	1	0	4.44	SA
The principal regularly shares expectations for student learning outcome.	46	27	8	1	0	4.44	SA
The principal emphasizes the importance of academic excellence to teachers and students.	42	30	10	0	0	4.39	SA
The principal communicates clear academic goals for the school.	33	43	6	0	0	4.33	SA

OVERALL MEAN 4.23

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

Table 4 presents the respondents' assessment of defining the school's mission practices. Among the indicators, "The principal ensures that teachers understand the school's vision and mission" obtained the highest weighted mean of 4.85 (SA). These findings suggests that the principal consistently and clearly communicates the school's vision and mission, ensuring that teachers are well-aligned with the school's core purpose and long- term goals. Although still positively rated, the lowest weighted mean obtained was 3.27, interpreted as Agree (A). This suggests that while expectations for student learning outcomes are communicated, there is an opportunity for the principal to further strengthen the consistency and clarity of these communications.

Overall weighted mean of 4.23 (SA) for defining the school's mission indicates that the principal effectively establishes a clear vision and purpose for the school. This demonstrates that the principal provides, and supporting overall school improvement. Research highlights that a clearly defined school mission strengthens organizational focus, promotes teacher commitment, and positively impacts student learning outcomes (Papadakis et al., 2024). Similarly, empirical evidence shows that effective communication and implementation of a school's mission are strongly associated with improved student achievement and educational outcomes, emphasizing the importance of clearly articulated school goals in fostering academic success (Adnan *et al.*, 2024).

Table 5. *Managing the Instructional Program*

ITEMS	STRONGLY AGREE	AGREE	NEUTRAL	AGREE	STRONGLY DISAGREE	MEAN	INTERPRETATION
The principal monitors the implementation of the school curriculum	47	24	11	0	0	4.44	SA
The principal supervises classroom instruction effectively.	42	26	13	1	0	4.33	SA
The principal conducts regular classroom observations and feedback.	36	35	9	2	0	4.28	SA
The principal rephrase achievement to guide instructional decisions.	44	25	12	1	0	4.27	SA
The principal coordinates teaching and learning activities to ensure consistency across grade level.	33	36	10	3	0	4.21	SA
OVERALL MEAN						**3.92**	

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

Table 5 presents the respondents' assessment of managing the instructional program. The highest weighted mean obtained of 4.44 (SA), this suggests that the principal plays an active role in ensuring that the prescribed curriculum is properly implemented across classrooms. The lowest weighted mean recorded 4.21 (DS), which indicates that respondents perceive a gap in the coordination of instructional practices across grade levels, which may affect coherence and alignment of instruction within the school.

The overall mean of 3.93 (N) indicates that respondents generally agree that the principal effectively manages the instructional program. This suggests that the principal provides guidance in planning, coordinating, and monitoring curriculum implementation, which helps ensure that teaching and learning activities are organized and aligned with academic goals. Emphasizes that effective instructional management by school leaders promotes coherence across grade levels, supports teacher performance, and positively influences student achievement (Hallinger & Wang, 2021). Likewise, recent studies show that principals who actively coordinate curriculum, monitor instruction, and support professional development contribute to improvements in teacher effectiveness and student learning outcomes, highlighting the central role of instructional

management in fostering school success (International Journal of Education, Learning and Development, 2024).

Table 6. *Developing a Positive School Learning Climate*

ITEMS	STRONGLY AGREE	AGREE	NEUTRAL	AGREE	STRONGLY DISAGREE	MEAN	INTERPRETATION
The principal ensures that instructional time is maximized and protected.	38	30	11	3	0	4.26	SA
The principal promotes a culture of collaboration among teachers.	36	33	10	3	0	4.24	SA
The principal support for teachers 'professional development.	32	28	9	3	0	4.20	A
The principal motivates teachers and student to achieve high standards.	33	35	11	3	0	4.15	A
The principal rewards teachers' professional accomplishments.	29	38	13	2	0	4.15	A
OVERALL MEAN	**4.20**						

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

Table 6 presents the respondents' assessment of developing a positive school learning climate. The highest weighted mean recorded 4.26 (SA), suggesting that the principal places strong emphasis on safeguarding instructional time to support effective teaching and learning. The lowest weighted mean obtained of 4.15, still interpreted as Agree (A). Although positively perceived, the result implies that recognition and reward mechanisms may not be consistently implemented or may require enhancement to further boost teacher morale and performance.

Overall mean score 4.20 (A) indicates a high level of agreement that positive learning outcomes are being developed, this suggest that respondents generally perceived the learning experience as effective, with strong evidence that learners are gaining knowledge, skills, or attitudes as intended. The studies note that effective recognition programs strengthen motivation and organizational commitment, yet challenges such as inconsistent implementation may limit their impact (Baldomar, 2025), while leadership recognition and appreciation are shown to improve teacher morale and collaborative climate (Jones et al., 2023, as cited in JETIR, 2025).

Summary of Principal Instructional Leadership (Tables 4- 6)

Table 7

DOMAIN	OVERALL MEAN	INTERPRETATION
Defining the School's Mission	4.23	SA
Managing the Instructional Program	3.92	A
Developing a Positive School Learning Climate	4.20	A
Overall Weighted Mean	4.12	A

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

The summary of the principal's instructional leadership, as reflected in Tables 4 to 6, shows that respondents generally perceived the principal as highly effective in guiding the school. Among the three domains, defining the school's mission received the highest overall mean of 4. 23 (SA), indicating strong agreement that the principal establishes a clear vision and purpose. Managing the Instructional Program and developing a Positive school learning climate were rated slightly lower, with overall means of 3.92 (A) and 4.20 (A), respectively, demonstrating general agreement that the

principal provides guidance, support, and motivation for teachers. The overall weighted mean of 4.12 (A) reflects that the principal's instructional leadership is perceived as generally effective in promoting school improvement and positive learning outcomes.

Building the overall perception of the principal's instructional leadership as generally effective, the following section examines how these leadership practices relate to student academic achievement, aligning with research that emphasizes the significant but complex influence of instructional leadership on learners outcomes (Nguyen & Nguyen, 2023) and highlighting that instructional leadership has an indirect yet meaningful effect on student performance through teacher support and instructional improvement (Alvarez & Torres, 2024).

The Level of Teachers' Educational Integration in Terms of:

Table 8. *Technological Knowledge (TK)*

ITEMS	STRONGLY AGREE	AGREE	NEUTRAL	AGREE	STRONGLY DISAGREE	MEAN	INTERPRETATION
I can operate the digital tools needed in delivering lessons (e.g., projectors, laptops, tablets).	47	32	3	0	0	4.54	SA
I can create or use multimedia materials (videos, graphics, presentations) to enhance instructional delivery.	47	32	3	0	0	4.43	SA
I stay updated on the new technologies that can support classroom instruction.	38	41	5	3	0	4.43	SA
I can troubleshoot basic technical problems that occur during lessons.	33	44	5	0	0	4.34	SA
I can use various digital tools (e.g., word processors, spreadsheets, presentation software) in my teaching.	33	44	4	1	0	4.33	SA
OVERALL MEAN						**4.41**	

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

The findings show that the highest weighted mean 4.54 (SA) was obtained for operating digital tools in lesson delivery, indicating that respondents demonstrate strong competence in handling instructional technologies. This reflects a high level of digital readiness, which essential since teacher digital competence is considered fundamental for improving teaching and learning process and supporting quality instruction (Dominguez et al., 2025). In contrasts, the lowest weighted mean was 4.33 (SA) recorded for the use of various digital tools in teaching. Although still positive, this suggests comparatively lower confidence in diversifying digital applications, highlighting the need for continuous training and institutional support to strengthen pedagogical integration of technology (Fernande et al., 2025).

Overall weighted mean of 4.41 (SA) indicates a very high level of technological knowledge among respondents, implying that teachers are generally capable of integrating digital resources into classroom instruction. This aligns with literature emphasizing that digital competence extends beyond technical skills to include creating interactive learning experiences and adapting to technological changes in education (Diachuk, 2024). Additionally, recent research highlights that

teachers' technological knowledge is strongly associated with their ability to design meaningful technology-enhanced learning activities and confidently implement digital tools to support student engagement and achievement (Smith & Lee, 2023).

Table 9

ITEMS	STRONGLY AGREE	AGREE	NEUTRAL	AGREE	STRONGLY DISAGREE	MEAN	INTERPRETATION
I use assessment strategies that help track and improve students' learning outcomes.	51	30	1	0	0	4.61	SA
I can adjust my teaching methods based on student differences and learning challenges.	47	32	3	0	0	4.54	SA
I can adapt teaching strategies to engage students with different learning needs.	46	33	3	0	0	4.52	SA
I can manage classroom activities effectively when integrating technology.	44	36	2	0	0	4.51	SA
I can design lessons that promote active engagement and participation.	47	30	5	0	0	4.51	SA

Pedagogical Knowledge (PK)

OVERALL MEAN 4.54

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

The item with the weighted mean of 4.61(SA), indicates that the teachers strongly demonstrate the use of assessment strategies to monitor and improve student learning, reflecting strong pedagogical competence that supports effective instruction and learner outcomes. Studies show that pedagogical competence significantly influences teaching practices and student achievement (Lestari et al., 2024). The lowest weighted mean of 4.51 (SA), though still very high, suggests comparatively less strength in classroom management with technology integration and designing engaging lessons, implying areas that may benefit from continued enhancement.

Overall weighted mean of 4.54 (SA), reflects a very high level of pedagogical knowledge among respondents, indicating strong mastery of instructional practices that contribute to effective teaching and improved student outcomes (Bhuttah et al., 2024).

Table 10

ITEMS	STRONGLY AGREE	AGREE	NEUTRAL	AGREE	STRONGLY DISAGREE	MEAN	INTERPRETATION
I fully understand the subject and content I teach.	50	32	0	0	0	4.61	SA
I stay updated with curriculum guides and content	50	30	2	0	0	4.56	SA

standards relevant to my subjects.							
I can explain subject concepts in ways that connect with learners' everyday experiences.	50	30	2	0	0	4.56	SA
I can confidently answer students' questions related to the subject matter.	45	35	2	0	0	4.50	SA
I know how to organize content so that it is meaningful for my students.	44	34	4	0	0	4.49	SA

Content Knowledge (CK)

OVERALL MEAN 4.54

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

The highest weighted mean 4.61 (SA), indicates that teachers strongly demonstrate mastery of the subject they teach, reflecting solid content expertise that supports effective instruction and student learning. The lowest weighted mean 4.49 (SA), still interpreted as strongly agree suggests comparatively less confidence in organizing content meaningfully for learners, indicating a potential area for continued professional development.

Overall weighted mean 4.49 (SA), reflects a very high level of content knowledge, signifying that the respondents are well equipped to deliver accurate and relevant instruction. Content knowledge remains a critical foundation for teaching effectiveness and student achievement (Choi, 2025).

Table 11. *Pedagogical Content Knowledge (PCK)*

ITEMS	STRONGLY AGREE	AGREE	NEUTRAL	AGREE	STRONGLY DISAGREE	MEAN	INTERPRETATION
I can design assessments that help students masters difficult concepts.	49	31	2	0	0	4.55	SA
I can select effective teaching strategies to make the subject content easier for	45	36	1	0	0	4.52	SA

students to learn.							
I can anticipate which parts of the lesson may be challenging for learners.	42	39	1	0	0	4.49	SA
I can modify lessons to match both subject content and students' level.	42	34	6	0	0	4.44	SA
I can select illustrations, examples, or analogies that make content easier to understand.	44	35	3	0	0	4.44	SA

OVERALL MEAN 4.49

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

Table 11 presents the highest weighted mean of 4.55 (SA), indicates teachers has the ability to design assessment that help students master difficult concepts, reflecting strong pedagogical content knowledge that supports effective teaching and improved learning outcomes. Pedagogical content knowledge is recognized as a vital component of teachers' professional expertise, enabling them to deliver instruction effectively and improve students' learning experiences (Fukaya et al., 2024). The lowest weighted mean (4.44) indicates relatively lower strength in modifying lessons and using illustrative strategies suited to learners' levels, although it still falls within the strongly agree range. This highlights a potential area for further enhancement, as pedagogical content knowledge requires teachers to recognize learning difficulties and adjust instruction according to students' needs (Gomez, 2020, as cited in recent curriculum research).

Overall, the general weighted mean of 4.49 signifies a very high level of pedagogical content knowledge among respondents, demonstrating their strong ability to integrate pedagogy with subject matter to improve teaching effectiveness and student learning outcomes (Jacob et al., 2020).

Table 12. *Technological Content Knowledge (TCK)*

ITEMS	STRONGLY AGREE	AGREE	NEUTRAL	AGREE	STRONGLY DISAGREE	MEAN	INTERPRETATION
I can use technology to present content in ways that increase student understanding.	40	40	2	0	0	4.92	SA
I can choose online resources aligned with the learning standards of my subjects.	34	45	3	0	0	4.45	SA
I can identify technologies that best represent concepts in the subjects I teach.	36	44	4	0	0	4.39	SA
I can evaluate a technology accurately supports the content I	36	39	7	0	0	4.35	SA

am teaching.							
I can use digital simulations videos, or, apps to demonstrate key subject concepts.	32	45	5	0	0	4.33	SA
OVERALL MEAN	**4.49**						

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

Table 12 presents the highest weighted mean 4.92 (SA) shows that teachers strongly use technology to present content in ways that enhance student understanding, reflecting strong technological content knowledge that supports learning (Edulan et al., 2025; ICT–TPACK study, 2024). The lowest weighted mean 4.33 (SA) suggests less confidence in using simulations, videos, or apps to demonstrate key concepts, highlighting an area for improvement (Zhao Ma et al., 2024).

Overall, the general weighted mean of 4.49 reflects a very high level of technological content knowledge among teachers, highlighting their strong capacity to integrate technology with subject matter for effective instruction (Mena-Guacas et al., 2025). This suggests that teachers are well-prepared to use digital tools to enhance learning experiences and clarify complex concepts. Furthermore, such proficiency in technological content knowledge can improve student engagement, facilitate interactive learning, and support higher academic achievement.

Table 13. *Technological Pedagogical Knowledge (TPK)*

ITEMS	STRONGLY AGREE	AGREE	NEUTRAL	AGREE	STRONGLY DISAGREE	MEAN	INTERPETATION
I can adapt, my teaching offers better ways to improve learning outcomes.	44	36	2	0	0	4.93	SA
I can use digital platforms to monitor students' progress and provide timely feedback.	35	40	6	0	0	4.79	SA
I can integrate technology to support differentiated instructions for learners.	39	41	2	0	0	4.43	SA
I can use technology to facilitate and manage collaborative learner activities.	38	40	4	0	0	4.41	SA
I can design interactive lessons using educational apps or digital	32	44	6	0	0	4.32	SA

tools.							

OVERALL MEAN 4.58

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

Table 13 presented the highest weighted mean 4.93 (SA), indicates teachers are capable of integrating digital tools thoughtfully to address diverse learning needs. The lowest weighted mean 4.32 (SA), which indicates that while teachers are generally competent in using technology, there is still room to improve their ability to create highly engaging, interactive digital learning experiences

Overall, the general weighted mean of 4.58 (SA) demonstrates a very high level of technological pedagogical knowledge among respondents, signifying their capability to integrate technology with pedagogy to enhance engagement, provide timely feedback, and improve learning outcomes (Mishra & Koehler, 2020).

Table 14. *Technological Pedagogical Content Knowledge (TPACK)*

ITEMS	STRONGLY AGREE	AGREE	NEUTRAL	AGREE	STRONGLY DISAGREE	MEAN
I can create meaningful learning experiences that combine content, pedagogy, and technology.	39	39	4	0	0	4.90
I can effectively integrate technology, pedagogy, and content knowledge in my classroom instruction.	42	40	0	0	0	4.51
I can assess students' learning outcomes by using-enhanced strategies.	43	36	4	0	0	4.49
I can evaluate whether the technology-enhanced lesson improved students' achievement.	40	39	3	0	0	4.49
I can adjust my lesson plan when instructional leadership encourages increased technology integration.	40	38	4	0	0	4.44

OVERALL MEAN 4.57

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

Table 14 presented the highest weighted mean of 4.90 (SA), this suggests that teachers are capable of thoughtfully combining these three knowledge domains to produce effective and engaging instruction. Teachers strongly create meaningful learning experiences that integrate content, pedagogy, and technology, reflecting a very high level of TPACK and the ability to design lessons that enhance student learning (Mishra & Koehler, 2020; Fauzi & Ningsih, 2024). The lowest weighted mean of 4.44 (SA), suggests relatively lower confidence in adjusting lesson plans based on instructional leadership that encourages increased technology integration, highlighting an area for continued professional development (Sari et al., 2023). Improving in this area may help teachers more effectively align their instruction with school-wide technology initiatives and maximize learning outcomes.

Overall, the general weighted mean of 4.57 (SA) shows that teachers in District Salvador Benedicto demonstrate a high level of educational technology integration, supported by technological, pedagogical, and content knowledge. The consistently high weighted means indicate competence in

using digital tools, designing technology-enhanced lessons, adapting instruction to diverse learners, and assessing student learning effectively. These findings affirm that strong TPACK is essential for meaningful and effective technology integration in classroom instruction, as supported by recent studies Chai et al. (2021).

Summary of Teachers' Technological Pedagogical Content Knowledge (TPACK)

(Table 8-14)

Table 15

DOMAIN	OVERALL MEAN	INTERPRETATION
Technological Knowledge (TK)	4.41	SA
Pedagogical Knowledge (PK)	4.54	SA
Content Knowledge (CK)	4.54	SA
Pedagogical Content Knowledge (PCK)	4.49	SA
Technological Content Knowledge (TCK)	4.49	SA
Technological Pedagogical Knowledge (TPK)	4.58	SA
TPACK	4.57	SA
Overall mean	4.52	SA

Legend: 4.21-5.00 (Strongly Agree), 3.61-4.20 (Agree), 2.41-3.60 (Neutral), 1.81-2.40 (Disagree), 1.00-1.80 (Strongly Disagree)

The summary of teachers' Technological Pedagogical Content Knowledge (TPACK) indicates a very high level of competence across all domains. Among the subdomains, Technological Pedagogical Knowledge (TPK)received the highest mean of 4.58 (SA), while Pedagogical Knowledge (PK) and Content Knowledge (CK) both scored 4.54 (SA), reflecting teachers' strong instructional strategies and subject-matter knowledge. Technological Knowledge (TK) scored 4.41 (SA), demonstrating that teachers are capable of effectively using digital tools in their instruction. The overall TPACK mean of 4.57 (SA) and the overall mean of 4.52 (SA), suggest that teachers are highly proficient in integrating technology, pedagogy, and content knowledge to deliver interactive and meaningful learning experiences, aligning with recent studies emphasizing the importance of TPACK for effective technology-enhanced teaching (Diachuk 2024).

Table 16. *Academic Achievement*

GRADE LEVEL	OUTSTANDING	VERY SATISFACTORY	SATISFACTORY	FAIRLY SATISFACTORY	NEEDS IMPROVEMENT	MPS	INTERPRE-TATION
	5	4	3	2	1		
Grade 4	67	215	230	94	2	3.41	S
Grade 5	65	230	220	86	1	3.45	S
Grade 6	62	192	243	121	0	3.32	S
					OVER ALL MEAN	3.40	

As shown in table 16 exhibiting the pupils' academic achievement in Grade, out of 608 pupils, 57 or 11.02% attained outstanding, which falls in the grade 91-100; 215 0r 35.36% got very satisfactory which is falls 86-90; 230 or 37.83% satisfactory with rating range from 80-85; 94 or 15.46% fairly satisfactory with grades ranging 75-89 and 2 0r 0.33% needs improvement with shown rating below 75. The weighted mean result of 3.41 categories the pupils' academic achievement in Grade 4 as very satisfactory. The achievement level of grade 4 having not reached the outstanding level needs enhancement activities.

With regards to Grade 5, 65 or 10.80% is reflected as outstanding marks; 230 or 32.21% got very satisfactory; 220 or 36.54% exhibits satisfactory; 86 or 14.28% ticked fairly satisfactory achievement, and 1 or 0.17% needs improvements. The weighted mean value of 3.45 classifies the pupils' academic achievement as very satisfactory with numerical rating of 86-90. This also implies improvement to reach the highest level of outstanding.

In Grade 6; 62 or 10.03% exhibit outstanding average rating; 192 or 31.08% very satisfactory; 243 or 39.32% satisfactory; 121 or 19.58% fairly satisfactory just like Grade 5 nobody has been disclosed to have not meet the expectation or needs improvement. The weighted mean result of 3.32 implies a very satisfactory level of academic achievement programs to increase it to the outstanding.

The overall weighted mean of 3.40 levels. The Grade 4, 5 and 6 pupils' academic achievement at very satisfactory category or with ratings ranging from 86-90. This level of academic achievement is already acceptable as it was very much above the Depart of Education (DepEd) standard for academic performance which set a minimum of 75%. However, it still necessitates improvement to reach the highest level which requires grades of 91-100. These findings align with recent research showing that most elementary pupils tend to achieve within Satisfactory and Very Satisfactory ranges, while fewer reach Outstanding, emphasizing the need for instructional strategies that enhance learning outcomes (Abarquez Jr. et al., 2025).

Table 17. ***The Relationship between Principal Instructional Leadership and Technology Integration***

N=82

Variables	r	I	P-value	Decision	Remark
Principal Instructional Leadership and Educational Technology Integration	0.986	Very High Correlation	0.002	Reject Ho	Significant

0.05 level of significance df=n-1

Displayed a computed Pearson r value of 0.986, which means that there is a very high correlation. The data revealed that there is a very significant relationship between the principal instruction leadership and educational technology integration, this is proven by the p-value of 0.002 lesser to 0.05 level significance ($p<0.05$) it means that the null hypothesis of this study is rejected. This further suggests that there is a significant relationship between the two variables of this study. A systematic review of empirical studies between 2021 and 2025 found that principals who provide resource support, professional development opportunities, and a positive digital culture enhance teachers' technological self-efficacy and capacity to integrate technology in teaching (Halomoan et al., 2024, as cited in Zeng & Cheah, 2025).

Table 18. ***The Relationship between Principal Instructional Leadership and Students' Achievements***

n=82

Variables	r	I	p-value	Decision	Remark
Principal Instructional Leadership and Student Achievement	0.265	Low positive correlation	0.667	Accept Ho	Not Significant

0.05 level of significance df=n-1

The computed value of Pearson r of 0.265 which means that there is no a low positive correlation it is a weak correlation nature but it still positive. The data revealed that there was no significant relationship between the principal instructional leadership and students' achievement. This was

proven by the p-value 0.667 which is greater than the significance level of 0.05 (p>0.05) it means that the null hypothesis is accepted. These findings are supported by recent research, which shows that instructional leadership does not always directly influence student achievement. For instance, Pietsch et al. (2023) and Gumus et al. (2022) found that general measures of principal leadership had negligible direct effects on academic performance, while contextual factors such as teacher quality and school climate played more significant roles. Similarly, Rivera (2024) reported that instructional leadership practices were not significantly associated with school performance or students' learning outcomes, emphasizing that other mediating factors can impact achievement. Therefore, there is no correlation between the two variables.

CHAPTER IV

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATION

This chapter presented the summary of finding, conclusion, and recommendations based on the results of the study.

Summary of Findings

This study was conducted to determine the relationship of principal instructional leadership and teachers' educational technology integration to the academic performance of grades 4-6 learners in the District of Salvador Benedicto. The study sought to assess the levels of principal instructional leadership, teachers' technology integration, and students' academic performance, and to identify any significant relationships among these variables. It investigated how instructional leadership practices of school heads and the integration of educational technology by teachers influence the learning outcomes of students in Grades 4-6 students. The study aimed to provide evidence on the effectiveness of instructional leadership and technology-enhanced teaching practices in improving students' achievement and to serve as a basis for designing interventions, such as the Instructional Leadership and Technology Integration Enhancement Program (ILTEP), to strengthen instructional practices in the district.

The result of the study answered the following questions:

Principal Instructional Leadership

Teachers perceived the level of principal instructional leadership as generally strong, with an overall weighted mean of 4.12 (SA). This indicates that principals effectively guide teaching practices, communicate the school's mission, supervise classroom instruction, and foster a positive learning climate. While leadership supports teacher performance and a conducive classroom environment, areas such as cross-grade coordination and consistent recognition of teachers require further improvement.

Teachers' Educational Technology Integration

Teachers demonstrated a high level of technology integration in their instruction, with an overall weighted mean of 4.52 (SA). They showed competence in technological, pedagogical, and content knowledge, effectively designing and implementing technology-enhanced lessons, adapting instruction for diverse learners, and using digital tools for assessment. This creates interactive and supportive learning environments that enhance teaching and learning outcomes.

Students' Academic Achievement

The overall academic achievement of Grade 4-6 learners in the District of Salvador Bnenedicto during SY 2025-2026 was very satisfactory, with a weighted mean of 3.40. Most pupils scored with in the 86-90 range, exceeding the DepEd minimum standard of 75 %, indicating that students generally performed well in their academic subjects. However, only a small portion of learners attained the outstanding level (91-100), suggesting that while achievement is acceptable, further

instructional interventions and enhanced support are needed to raise student performance to the highest level.

Conclusion

Based on the findings of the study, it can be concluded that principals in the District of Salvador Benedicto demonstrate strong instructional leadership practices as perceived by teachers, particularly in communicating the school's mission, managing instructional programs, and fostering a positive school learning climate. This indicates that school leaders generally provide effective guidance and support for instructional improvement. Teachers likewise exhibit a high level of educational technology integration, suggesting that they possess the necessary technological, pedagogical, and content knowledge to incorporate digital tools meaningfully in classroom instruction.

The academic achievement of Grades 4-6 students was found to be very satisfactory level, exceeding the minimum performance standard, though still short of reaching the highest level of outstanding performance. Statistical analysis revealed a very strong and significant relationship between principal instructional leadership and teachers' educational technology integration, highlighting the influence of leadership practices on teachers' adoption and use of technology. However, the relationship between principal instructional leadership and student achievement was weak and not significant, implying that students' performance may be affected by multiple factors beyond leadership alone.

In view of these conclusion, the development of the Instructional Leadership and Technology Integration Enhancement (ILTEP) is justified as a strategic response to strengthen leadership competencies and technology-supported instruction. Enhancing collaboration, instructional coordination, and sustained professional development is expected to support improved teaching practices and contribute to better learner outcomes in the district.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are proposed:

Principals. Should further strengthen instructional leadership practices, particularly in coordinating teaching and learning activities across grade levels and consistently recognizing teachers' professional accomplishments. Continuous supervision, data-driven decision-making and support for technology-integrated instruction should be sustained to enhance instructional coherence and teacher motivation.

Teachers. Encouraged to continue enhancing their competencies in integrating educational technology into classroom instruction. Participation in professional development activities, collaborative lesson planning, and reflective practices should be maintained to maximize the benefits of technology-supported teaching and learning.

Instructional Leadership and Technology Integration Enhancement Program (ILTEP). Should be implemented and institutionalized to strengthen instructional leadership and technology integration. Adequate resources, training opportunities, and monitoring mechanisms should be provided to ensure effective program implementation and sustainability.

Curriculum Planners and ICT Coordinators. Should align digital tools, learning resources, and training programs with curriculum standards to support teachers in designing meaningful and engaging technology-enhanced lessons that address diverse learner needs.

Future Studies. Explore additional variables influencing student achievement, such as learner motivation, home environment, teaching strategies, and school resources. Researchers may also replicate the study using different methodologies, larger samples, or longitudinal designs to validate and extend the findings.

Title of the Program: Instructional Leadership and Technology Integration Enhancement Program (ILTEP) for Grade 4-6

Rationale of the Program

The integration of educational technology and the quality of instructional leadership are critical factors influencing learners' academic achievement. Findings from related literature emphasize that effective instructional leadership strengthens teachers' instructional practices, while appropriate use of educational technology enhances learner engagement and achievement. However, gaps in leadership practices and inconsistent technology integration among teachers may limit optimal learning outcomes in Grade 4-6 in the District of Salvador Benedicto. This intervention program is designed to strengthen instructional leadership competencies of school heads and improve teachers' capacity to integrate educational technology effectively in classroom instruction, ultimately enhancing learners' academic achievement.

Program Objectives:

The program objectives are (1) to enhance instructional leadership practices of school heads in supervising and supporting technology-integrated instruction, (2) to improve teachers' competencies in integrating educational technology into daily lessons, (3) to increase the frequency and quality of technology-supported teaching strategies in Grade 4-6 classrooms, (4) to establish a monitoring and evaluation system for instructional leadership and technology integration, (5) to improve learners' academic performance in core subject areas.

Target Participants:

The participants are (1) school heads (Principals and Head Teachers) (2) grade 4-6 teachers (3) ICT coordinators (4) learners in grade 4-6 (direct beneficiaries)

Program Description

The ILTIEP is a school-based intervention program composed of leadership training, teacher capacity-building, classroom implementation, and continuous monitoring. The program will be implemented over one academic year and focuses on aligning instructional leadership practices with effective educational technology integration.

Table 19. *Program Implemented Table*

Timeline	Phase	Key Result Area	Objectives	Strategies / Activities	Person Responsible	Resources Needed	Success Indicators
Months 1	Planning & Needs Assessment (Phase 1)	Assessment of Instructional Needs.	Identify gaps in instructional leadership and technology integration	Conduct surveys, analyze pupil achievement data, classroom observations	School Head Master Teachers	Survey tools, observation forms, data records	Needs assessment report completed
Months 2-3	Capability and Building (Phase 2)	Professional Development	Enhance teachers' leadership and technology integration competencies	Training on TPACK, digital tools workshops, peer mentoring	ICT Coordinator, Trainers, Teachers	Training modules, laptops, internet access	Improved teacher competency levels
Months 4-7	Implementation (Phase 3)	Instructional Coaching & Technology Integration	Apply learning strategies in classroom instruction	Coaching sessions, demo teaching, collaborative lesson planning, multimedia lessons	School Head Teachers Master Teachers	Devices, lesson guides, software	Improved classroom observation ratings; increased pupils' engagement
Months 8-9	Monitoring & Evaluation (Phase 4)	Program Evaluation	Track effectiveness of program implementation	Classroom monitoring, review meetings, data collection and analysis	Monitoring team, School Head	Monitoring tools, evaluation forms	Monitoring reports completed; corrective actions applied

Months 10	Sustainability & Recognition (Phase 5)	Continuity Planning	Sustain program gains; motivate teachers and students	Recognition of best practices; planning for continued integration	School Heads Teacher	Certificates,planning templates	Sustainability plan developed; program institutionalized

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