

Differentiated Instructional Strategies Of Teachers And Students' Research Skills

Heide Felisilda

Abstract. The purpose of this study was to determine the effect size of instructional strategies on students' research skills in Marilog District, Davao City Division. This study used the descriptive-comparative research design. The respondents of this study were 74 senior high school students from the Marilog District of Davao City, City Division. The researcher used Tabachnick and Fidell's (2007) formula, $n = 50 + 8(m)$, where m represents the total number of independent variables included in the study, to select the respondents. The gathered data were analyzed and interpreted using statistical tools, including frequency and percentage, mean, One-way ANOVA, and Eta-squared. The results revealed that teachers predominantly use inquiry-based strategies in their teaching. Moreover, on the level of students' research skills, in terms of writing and reporting results, and problem conceptualization, were high. In terms of research methods and data analysis, they were found to be moderate. Furthermore, it was found that there is a statistically significant difference in students' research skills when exposed to instructional strategies. Lastly, regarding the effect size of teachers' instructional strategies on students' research skills, the results indicated a large effect size. Thus, it is recommended that teachers should refine and consistently apply inquiry-based instructional strategies in their classrooms. This instructional strategy enhances students' effectiveness in fostering critical thinking, problem-solving, and data analysis.

KEY WORDS

1. Instructional strategies
2. research skills
3. teachers
4. students
5. Davao City Division
6. Philippines

Date Received: April 05, 2025 — Date Reviewed: May 15, 2025 — Date Published: June 18, 2025

1. Introduction

Research skills are essential abilities that enable students to efficiently acquire, analyze, and evaluate information. These competencies enhance academic achievement and prepare students with essential skills to tackle real-world challenges across diverse professional environments. For students, developing robust research skills is not only an academic requirement; it is a transformative experience that equips them to integrate knowledge, conduct critical analyses,

and make significant contributions to their disciplines. This educational initiative, although simple in its methodology, faces numerous problems and practical obstacles that often hinder the effective development of research skills in pupils.

The intrinsic intricacies of the research process constitute one of the principal problems. Prospective students aspiring to succeed in the field of research must possess a significant level

of intellectual agility to manage the intricate relationship between formulating a research question, analyzing extensive literary data, developing methods, and interpreting hypotheses. Students may become ensnared in a labyrinth of ambiguity while attempting to negotiate these difficulties (Vásquez Falquez et al., 2023).

Ortega et al. (2021) aimed to evaluate the research skills and attributes of students at Batangas State University within the Philippine environment. The results demonstrated that the pupils have a significant level of intellectual integrity and openness. In conceptualizing the issue, they consider the prospective responses. They possess a comprehensive understanding of copyright and plagiarism regulations in the context of literature collection. study skills commence with the selection of a suitable study design. When interpreting the findings, researchers must present a list of practical efforts and ideas that are advantageous to the study's subject.

Moreover, a notable concern in Davao City is the deficiency of trained educators capable of teaching students research procedures. Due to a shortage of skilled individuals, certain educational settings have been compelled to appoint instructors lacking a robust background in study design to teach these types of classes. This circumstance leads to pupils receiving insufficient instruction, thereby impeding their ability to perform complex academic research effectively (Evardo, 2023).

The existing literature highlights the essential role of teachers in cultivating students' research skills; yet, there is a significant deficiency in understanding the impact of instructional tactics used by teachers on these skills. A multitude of students express dissatisfaction with the inadequate guidance and support from teachers, which hinders their ability to formulate research subjects, establish methodologies, and navigate the research process proficiently. This underscores the importance of conducting

a thorough investigation into the relationship between specific instructional tactics and the development of research competencies in students. This study aims to address this deficiency by enhancing instructional methodologies and equipping students more effectively for the demands of academic research.

This study aimed to explore the relationship between school heads' leadership styles and the overall school climate in the Marilog District, Division of Davao City. Specifically, it sought to determine the prevailing leadership styles of school heads, categorized as authoritarian, democratic, and laissez-faire. Additionally, the study assessed the level of school climate as perceived by stakeholders, focusing on three key dimensions: academic climate, community, and institutional environment. Furthermore, the research investigated whether there is a significant difference in the school climate when grouped according to the identified leadership styles.

The study tested two null hypotheses at the 0.05 level of significance. First, there is no significant difference in students' research skills when exposed to different instructional strategies. Second, instructional strategies do not significantly affect students' research skills, as measured by eta squared.

The results of this study provided useful insights for educational stakeholders. For the Department of Education, the findings support decisions related to curriculum design and teacher development. School heads can use the results to better guide teachers in using effective instructional strategies. Teachers are empowered to refine their methods to support student learning better. Students benefit from improved instruction that enhances their ability to conduct research. Future researchers can use this study as a reference for related investigations in other contexts.

Figure 1 illustrates the conceptual framework for the study's variables and their interactions. The independent variable comprised the

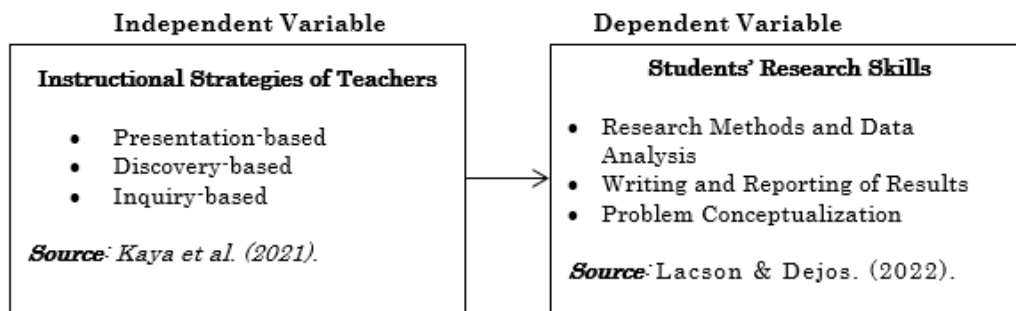


Fig. 1. Conceptual Framework

teaching styles employed by teachers, including presentation-based, discovery-based, and inquiry-based methods. The study's dependent variable was the research skills of pupils in the Marilog District, Davao City Division.

2. Methodology

The following section outlines the procedures used by the researcher to perform this research study. It encompasses population and sampling, instrumentation, data sources, and data analysis.

2.1. Research Design—This study employed a descriptive comparative design to examine how presentation-based, discovery-based, and inquiry-based instructional strategies influenced students' research skills without manipulating variables, making it suitable for identifying naturally occurring differences (Best Kahn, 2022). By comparing distinct teaching methods, the research aimed to reveal patterns and trends in students' abilities in planning, seeking, and conducting research, offering insights into how each approach shaped specific competencies (Fraenkel et al., 2019). This method enabled systematic data collection to inform educational practices and lay the groundwork for future causal investigations.

2.2. Ethical Considerations—This study adhered strictly to ethical standards, including obtaining informed consent, maintaining confidentiality, and prioritizing participant welfare, thereby ensuring voluntary and safe participation while safeguarding privacy by the Data Privacy Act of 2012. It explored the social value of

comparing presentation-based, discovery-based, and inquiry-based instructional strategies on students' research skills in Marilog District, aiming to inform educational policies and teaching practices to enhance learning outcomes. The researcher, qualified through academic preparation and guided by experts, utilized available resources and expert consultations to ensure the rigor and accuracy of the study. Participants were treated with fairness and respect, with measures in place to minimize vulnerability and avoid conflicts of interest. Transparency was maintained by openly sharing the study's purpose and results with stakeholders, thereby promoting both ethical integrity and practical benefits for students, teachers, and future researchers.

2.3. Research Respondents—The study involved all 74 senior high school students from Marilog District, Davao City Division, determined using Tabachnick and Fidell's (2007) formula. Universal sampling was employed to encompass the entire population, thereby enhancing

ing validity and minimizing sampling bias while examining students' research skills across three instructional strategies: presentation-based, discovery-based, and inquiry-based (Creswell Creswell, 2023). Inclusion criteria focused on currently enrolled senior high students to ensure relevant data on how differentiated teaching methods affect research skills (Polit Beck, 2019).

2.4. Research Instrument—This study employed adapted 15-item survey questionnaires to assess teachers' instructional strategies (presentation-based, discovery-based, and inquiry-based) from Kaya et al. (2021) and students' research skills from Lacson et al. (2022), encompassing research methods, data analysis, writing, and problem conceptualization. The questionnaires underwent expert content validation and a pilot test, resulting in a strong reliability score of .86 for the students' research skills tool, ensuring the instruments were valid and reliable for the study.

2.5. Data Gathering Procedure—This study followed a structured data collection process to ensure reliability and validity. Permission to conduct the study was first obtained from

institutional authorities, including the Dean of the Graduate School and the Division Superintendent. The instruments were validated by a panel of experts through face-to-face evaluation and revised based on feedback, followed by a pilot test with 30 non-participant students to confirm reliability. Questionnaires were then distributed in person to encourage honest responses and collected only after completion, ensuring data quality. Finally, the data were analyzed using SPSS to generate accurate and meaningful insights in line with institutional standards.

2.6. Data Analysis—The study employed several statistical tools to analyze the data effectively. Frequency and percentage were applied to evaluate teachers' instructional strategies, while the mean measured students' research skill levels across key areas. One-way ANOVA was used to test for significant differences in research skills based on instructional strategies, and Eta-Squared was used to determine the effect size, indicating how much variance in students' skills was explained by the teaching methods.

3. Results

This section outlines the findings and discussion of the research. The presentation began with an extensive discussion of instructional strategies employed by teachers, including presentation-based, discovery-based, and inquiry-based approaches. The section subsequently provided the analysis of the level of students' research skills in terms of research methods and data analysis, writing and reporting of results, and problem conceptualization. The next portion presented the significant difference in students' research skills when exposed to instructional strategies. The concluding section discussed the effect size of instructional strategies on students' research skills.

3.1. Instructional Strategies of Teachers In Marilog District, Davao City Division—Table 1 displays the data on the instructional strategies of teachers. The findings indicated that the majority of teachers employed the Inquiry-based strategy, with 41 respondents, accounting for 55.41 percent of the total responses. This was followed by the Discovery-based strat-

egy, with 19 respondents or 25.68 percent. The Presentation-based strategy had the lowest frequency, with 14 respondents, representing 18.92 percent. These results suggest that teachers predominantly prefer inquiry-based strategies in their teaching, with a smaller proportion favoring discovery-based and presentation-based strategies.

Table 1. Instructional Strategies of Teachers in Marilog District, Davao City Division

No.	Instructional Strategy	N	Frequency	Percentage
1	Presentation-based	74	14	18.92%
2	Discovery-based	74	19	25.68%
3	Inquiry-based	74	41	55.41%
Overall		74	74	100%

3.2. *Level of Students' Research Skills*—Table 2 presents the level of students' research skills, which were measured by three indicators: Research Methods and Data Analysis, Writing and Reporting of Results, and Problem Conceptualization. The mean ratings of these indicators are as follows: Research Methods and Data Analysis (3.37), which was described as mod-

erate; Writing and Reporting of Results (3.42), described as high; and Problem Conceptualization (3.45), also described as high. The three indicators on the level of students' research skills generated an overall mean rating of 3.41, described as high. This indicates that students' research skills in terms of data analysis, writing and reporting, and problem conceptualization were oftentimes evident.

Table 2. Level of Students' Research Skills

No.	Item	Mean	Descriptive Level
1	Research Methods and Data Analysis	3.37	Moderate
2	Writing and Reporting of Results	3.42	High
3	Problem Conceptualization	3.45	High
Overall Mean		3.41	High

Legend: 1.00–1.79: Very Low, 1.80–2.59: Low, 2.60–3.39: Moderate, 3.40–4.19: High, 4.20–5.00: Very High

3.3. *Significant Difference in Students' Research Skills When Exposed to Instructional Strategies*—The findings in Table 3 revealed a significant difference in the level of students' research skills when exposed to instructional strategies. The computed F-value of 49.413 and the p-value of 0.000, which is less than the standard level of significance of 0.05, indicate a statistically significant difference between the

variables. This suggests that the instructional strategies employed by teachers have a significant impact on students' research skills. Given the p-value of .000, the null hypothesis, which stated that there is no significant difference in students' research skills when exposed to different instructional strategies, was rejected, confirming that instructional strategies play a crucial role in enhancing students' research capabilities.

Table 3. Significant Difference in Students' Research Skills When Exposed to Instructional Strategies

Variable Paired	Sum of Squares	df	Mean Square	F	p-value
Instructional Strategies of Teachers and Students' Research Skills	1434.805	89	286.961	49.413	.000*

*Significant at $p < .05$; Descriptive Interpretation: Significant

3.4. *Effect Size of Instructional Strategies of Teachers on Students' Research Skills*—Table 4 provides insight into the effect size of teachers' instructional strategies on the research skills. The t-value of -20.89 is accompanied by an Eta-Squared value of 0.831, which indicates a large effect size. Eta-Squared measures the proportion of variance in the dependent variable—research skills—that is explained by the

independent variable, which in this case was the instructional strategies of teachers. With an Eta-Squared value of 0.525, this implies that 52.5 percent of the variance in research skills can be attributed to differences in instructional strategies. This large effect size highlights the substantial and influential role of instructional strategies in shaping the overall research skills of the students in Marilog District, Davao City Division.

Table 4. Effect Size of Instructional Strategies of Teachers in Students' Research Skills

N	t-value	Eta-Squared	Descriptive Interpretation
74	8.021	0.525	Large

4. Discussion

This study aimed to determine the instructional strategies employed by teachers, specifically those based on presentation, discovery, and inquiry. Moreover, to determine the level of students' research skills in terms of research methods and data analysis, writing and reporting of results, and problem conceptualization. The next portion presented the significant difference in students' research skills when exposed to instructional strategies. Lastly, the findings discussed the effect size of instructional strategies on students' research skills in Marilog District, Davao City Division. The following are the significant findings:

Regarding the instructional strategies employed by teachers in Marilog District, Davao City Division, the findings indicated that the majority of teachers preferred the Inquiry-based strategy, reflecting a strong inclination toward encouraging student exploration and critical thinking. With a significant portion of respondents utilizing this approach, it stands as the dominant method. The Discovery-based strategy was followed, while the Presentation-based strategy was the least favored. These findings suggest that teachers prioritize active and student-centered methodologies, likely contributing to enhanced engagement and deeper learning experiences in the classroom.

On the level of students' research skills in Marilog District, Davao City Division, the study revealed that students demonstrated a moder-

ate level of competency in research methods and data analysis, implying these skills were sometimes evident in their outputs. However, they showed a high level of skill in writing and reporting of results as well as in problem conceptualization, which were oftentimes evident. This suggests that while students are still developing foundational research competencies, their strengths lie in articulating findings and framing research problems—areas likely influenced by the instructional strategies used by their teachers.

The analysis revealed a statistically significant difference in students' research skills when grouped according to the instructional strategies employed by teachers. This means that the type of instructional strategy employed has a meaningful effect on how well students perform

in research-related tasks. The findings support the notion that targeted teaching approaches can substantially enhance the development of various research competencies among students.

Regarding the effect size of instructional strategies on teachers' research skills, the results showed a strong influence of these strategies on students' research skills. With a large effect size indicated, it is clear that the choice of teaching strategy plays a crucial role in shaping students' overall research performance. This underlines the importance of using effective, research-oriented instructional approaches to better equip students with the necessary skills

in research and inquiry.

The study recommends that the Department of Education promote research-oriented strategies, especially inquiry-based learning, through training programs and curriculum integration. School leaders should support these methods by providing resources and encouraging innovative teaching practices. Teachers are advised to apply inquiry-based strategies and collaborate to enhance their effectiveness consistently. Students should actively engage in activities that build research skills. Future researchers are encouraged to expand the study to other areas and explore qualitative methods for deeper insights.

5. References

- Best, J. W., & Kahn, J. V. (2022). *Research in education (10th ed.)* Pearson.
- Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches (4th ed.)* SAGE Publications.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2019). *How to design and evaluate research in education (10th ed.)* McGraw-Hill Education.
- Kaya, I., Habaci, I., Küçük, S., Adigüzelli, F., & Habaci, M. (2021). Development of instructional strategies scale: Reliability and validity. *World Applied Sciences Journal*, 15(4), 507–516. [https://www.idosi.org/wasj/wasj15\(4\)11/8.pdf](https://www.idosi.org/wasj/wasj15(4)11/8.pdf)
- Stewart-Wingfield, S., & Black, G. (2020). Active versus passive course designs: The impact of student outcomes. *Journal of Education for Business*, 81, 119–125.
- Vásquez Falquez, G. G., Murillo Noriega, D. E., León Sinche, J. C., & Asqui Luna, J. E. (2023). Challenges and barriers to the development of research skills in university students. *Migration Letters*, 20(S12), 345–356.