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The Role of Peer Coaching in Developing Students' Engagement and Competence in Science Research

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Abstract*—This study, the role of peer coaching in developing students' engagement and competence in science Research, aimed to assess how peer coaching is linked to students' level of engagement, motivation, and skill development in conducting science research. It aimed to answer the following questions: the extent of the role of peer coaching as perceived by the Senior High School students; also, the level of students' engagement and competence in science research; and the significant relationship and effect on the role of peer coaching in student engagement and competence in science research in Senior High School. The researcher used a descriptive-correlational research design in the conduct of this research. Fifty (50) purposively selected students were the respondents of this research. A validated researcher-made questionnaire was used to gather the necessary data for this analysis. Mean, standard deviation, Pearson r correlation, and regression analysis were used as appropriate statistical tools to analyze the data. The findings showed that the extent of the role of peer coaching, as perceived by the Senior High School students, is to a very great extent. Also, student engagement is very high across all dimensions. In addition, the level of students' competence in science research is rated as very satisfactory to outstanding. Furthermore, no significant relationship was found between the role of peer coaching and student engagement, as well as its effect on their competence in science research. The results revealed that peer coaching was implemented to a very great extent and was not significantly associated with students' engagement, particularly in terms of motivation and self-regulation, leading to the acceptance of the null hypothesis. In addition, no significant effect was found between peer coaching and students research competence, thus the hypothesis is also accepted. Considering the results and findings, teachers are encouraged to integrate organized peer coaching strategies, particularly in feedback and sharing knowledge, to enhance students' self-regulation and motivation in science research. Schools should also provide guided instruction and mentoring, as peer coaching alone was found insufficient to significantly improve science research competence. Given the accepted finding that peer coaching has no significant effect on research competence, additional instructional interventions are necessary. These efforts will help strengthen students' planning, formulation of research questionnaire, and methodological skills while sustaining their engagement.*

***Keywords*—** *Peer coaching, student engagement, research competence, science research, self-regulation.*

I. INTRODUCTION

In recent years, there has been growing recognition worldwide of the importance of not only knowledge acquisition but also the development of competence and engagement skills in students, particularly at the Senior High School (SHS) level. The K-12 educational reforms in many countries, including the Philippines, emphasize research subjects Practical Research, and Inquiry, Immersion and Investigation so that learners become not only consumers of knowledge but also active producers of new insights. As cited by Salmeron (2020), the capacity to carry out scientific inquiry, evaluate data critically, and communicate findings effectively are now considered crucial elements of science education.

Science achievement and science process skills are strongly tied to students' research competence. A study in Iloilo found that Grade 12 learners with higher science process skills also performed better in research competence measures, though skill levels varied by district and were sometimes only "moderate" or "competent" rather than excellent. This indicates that while SHS students are being exposed to somewhat rigorous research requirements, there is still a gap in fully developing research competence.

Students' engagement is likewise critical. Engagement refers to how students invest themselves behaviorally, cognitively, and emotionally in learning tasks. Several recent studies show that SHS students' engagement in research is challenged by writing apprehension, difficulty with procedural and data-analysis skills, time management, and limited feedback (Bastida and Saysi, 2023).

Amid these challenges, interventions that support both competence and engagement are being explored. One such intervention is peer coaching where students guide, support, critique, or collaborate with each other under some structure. Peer coaching has been studied in other similar fields: for instance, in teaching internships, peer coaching was found effective in improving lesson planning, instruction delivery, feedback provision, and reflective practices among prospective teachers leading to better academic performance.

However, while peer coaching has been shown beneficial in domains such as chemistry as Peer-Led Team Learning increasing achievement and engagement and in other settings like teaching internships in 2025 effectiveness of peer coaching improving academic performance there is relatively less direct empirical work in the Philippine SHS setting specifically linking peer coaching to both engagement and research competence in science investigatory projects.

Thus, this study aims to examine the role of peer coaching in developing Senior High School students' engagement and research competence in Science Investigatory Projects. Specifically, it investigates how peer coaching affects students' behavioral, cognitive, emotional, collaborative, and self-regulated engagement, and how this in turn relates to their competence in research conceptualization, methodology, data collection and analysis, writing/documentation, and

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presentation/defense. By doing so, this research can contribute to improving pedagogical strategies in SHS science, helping schools design more effective peer coaching models and better support students in meeting the challenges of research subjects.

1.1 *Statement of the Problem*

Problem/s which were addressed by the research

The study wanted to determine the peer coaching and its role in developing SHS students' engagement and research competence in science.

It sought to answer the following questions.

1. What is the extent of the role of peer coaching as perceived by Senior High School students in terms of:
   1.1 Communicating actively;
   1.2 Placing collaboratively;
   1.3 Sharing knowledge;
   1.4 Mutual accountability; and
   1.5 Sharing feedback;
2. What is the level of student's engagement in science research in terms of:
   2.1 active participation;
   2.2 Motivation;
   2.3 task commitment; and
   2.4 self-regulation;
   3. What is the level of students' competence in Science Research:
   3.1 research planning;
   3.2 formulating research question; and
   3.3 preparing of research methodology
   4. Is there a significant relationship between the role of peer coaching and student engagement in science research?
5. Is there a significant effect on the role of peer coaching in student competence in science research?

II. Methodology

The researcher used a descriptive-correlational research design in the conduct of this research. Fifty (50) purposively selected students were the respondents of this research. A validated researcher-made questionnaire was used to gather the necessary data for this analysis. Mean, standard deviation, Pearson r correlation, and regression analysis were used as appropriate statistical tools to analyze the data.

III. Results and Discussion

This part covered the presentation, interpretation and analysis of the data gathered in this study. All specific questions in Chapter 1 under the statement of the problem were answered in this chapter, supported by tables. The data are analyzed using statistical measures like mean and standard deviation to describe the roles of peer coaching in developing students' engagement and competence in science research.

Extent of the Role of Peer Coaching

In this study, the extent of the Role of Peer Coaching as perceived by Senior High School Students refers to Communicating Actively, Planning Collaboratively, Sharing Knowledge, Mutual Accountability and Sharing Feedback. The following tables show the specific statements evaluated, along with the corresponding mean scores, standard deviation, remarks, and verbal interpretation from the perspectives of respondents.

The extent of the Role of Peer Coaching as perceived by Senior High School Students is revealed in the following tables present the results of the data analysis, including the statements, mean, standard deviation, remarks, and verbal interpretation, which serve as the basis for the discussion of findings.

Table 1 presents the extent of the Role of Peer Coaching in Senior High School students in terms of Communicating Actively, specifically it how students participate and engage in facilitating collaboration and enhance understanding scientific concepts in research.

Table 1. Extent of the Role of Peer Coaching as perceived by Senior High School Students in terms of Communicating Actively

Statement In sharing ideas clearly while listening attentively, I can...	Mean	SD	Remarks
…feel that peers are prepared to assist when challenges in comprehending scientific concepts arise.	4.68	0.47	Strongly Agree
…observe that classmates communicate to help complete research-related tasks	4.80	0.40	Strongly Agree
…find reassurance in communicating with peers to seek guidance when experiencing difficulties in research.	4.76	0.43	Strongly Agree
…appreciate how peers' express empathy and encouragement through communication.	4.76	0.43	Strongly Agree
…motivate persistence in accomplishing research responsibilities through communication with peers.	4.74	0.44	Strongly Agree
Weighted Mean	4.75		
SD	0.43		
Verbal Interpretation	Very Great Extent		

The respondents strongly agree that they feel peers are prepared to assist when challenges in comprehending scientific concepts arise and that classmates communicate effectively to help complete research-related tasks. They also strongly agree that they find reassurance in communicating with peers when seeking guidance during difficulties in research, appreciate peers' empathy and encouragement, and feel motivated to persist in accomplishing research responsibilities through active communication.

The extent of peer coaching in terms of communicating actively attained a weighted mean of 4.75 with a standard deviation of 0.43, verbally interpreted as Very Great Extent. This indicates that peer communication plays a significant role in supporting students' understanding, collaboration, and motivation in research-related tasks. This further implies that students benefit from an environment where open communication, empathy, and mutual support are consistently practiced.

The findings indicate that active communication is a vital component of peer coaching. Through clear idea-sharing, attentive listening, and supportive interactions, students are able to enhance their learning experiences, overcome

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challenges, and develop confidence in completing research tasks effectively.

The table 2 shows the extent of the Role of Peer Coaching in terms of Planning Collaboratively, specifically it highlights the distribution of each response across the given indicators on how students on how students engage in collaborative planning, organizing research activities, supports problem solving and decision making in science research.

Table 2. Extent of the Role of Peer Coaching as perceived by Senior High School Students in terms Planning Collaboratively

Statement When planning collaboratively in research, I can…	Mean	SD	Remarks
…work collaboratively with classmates in planning and organizing research activities	4.66	0.48	Strongly Agree
…share roles and responsibilities with peers to understand research procedures	4.78	0.42	Strongly Agree
…Examine how collaborative planning supports problem-solving and decision-making in research.	4.80	0.40	Strongly Agree
…recognize that collaborative planning of research tasks improves research quality.	4.76	0.43	Strongly Agree
…acknowledge that collaborative planning with peers enhances teamwork and leadership."	4.82	0.39	Strongly Agree
Weighted Mean	4.76		
SD	0.42		
Verbal Interpretation	Very Great Extent		

Clearly, the respondents strongly agree that they are able to work collaboratively with classmates in planning and organizing research activities and share roles and responsibilities to better understand research procedures. They also strongly agree that collaborative planning supports problem-solving and decision-making, improves the quality of research outputs, and enhances teamwork and leadership among peers.

The extent of peer coaching in terms of planning collaboratively attained a weighted mean of 4.76 with a standard deviation of 0.42, verbally interpreted as Very Great Extent. This indicates that collaborative planning is an essential aspect of peer coaching that significantly contributes to students' ability to organize, execute, and improve their research tasks. This further implies that students benefit from shared responsibilities and collective decision-making, which strengthen both their academic performance and interpersonal skills.

In summary, the findings suggest that planning collaboratively plays a crucial role in peer coaching. Through teamwork, shared responsibilities, and active participation in planning, students are able to enhance research quality, develop leadership skills, and effectively accomplish research-related activities. Overall, collaborative planning fosters a supportive learning environment that strengthens students' engagement and research competence.

Table 3 indicates the extent of the Role of Peer Coaching as perceived by Senior High School students specifically, on how students engage in sharing knowledge assist in fostering positive learning attitudes and enhancing confidence that promotes peers reducing research related anxiety.

Table 3. Extent of the Role of Peer Coaching as perceived by Senior High School Students in terms of Sharing Knowledge

Statement When sharing knowledge in a group-based tasks, I can…	Mean	SD	Remarks
…use peer feedback to boost confidence in presenting research outputs.	4.70	0.46	Strongly Agree
…apply peer exchanges to manage anxiety in challenging research task	4.78	0.42	Strongly Agree
…examine how peer knowledge sharing fosters positive attitudes toward learning and research.	4.82	0.39	Strongly Agree
…respect peers' willingness to share knowledge that sustains engagement and commitment to research.	4.72	0.45	Strongly Agree
…promote collaborative knowledge sharing to boost confidence, ease anxiety, and foster positive attitudes toward research.	4.78	0.42	Strongly Agree
Weighted Mean	4.76		
SD	0.43		
Verbal Interpretation	Very Great Extent		

The respondents strongly agree that they use peer feedback to boost confidence in presenting research outputs and apply peer exchanges to manage anxiety in challenging research tasks. They also strongly agree that sharing knowledge fosters positive attitudes toward learning and research, promotes respect for peers' willingness to share ideas, and encourages collaborative knowledge sharing that enhances confidence and engagement.

The extent of peer coaching in terms of sharing knowledge attained a weighted mean of 4.76 with a standard deviation of 0.43, verbally interpreted as Highly Effective. This indicates that knowledge sharing among peers significantly contributes to students' confidence, emotional readiness, and positive learning attitudes. This further implies that collaborative learning environments encourage active participation and deeper understanding of research tasks.

In summary, the findings suggest that sharing knowledge is a vital component of peer coaching. Through active exchange of ideas and mutual support, students are able to build confidence, reduce anxiety, and develop a more positive and engaged approach to research.

Table 4 shows that the extent of the Role of Peer Coaching as perceived by the Senior High School students in terms of Mutual Accountability specifically, it highlights how students engaged in responsibility among their peers which influence engagement, enhance motivation and improve research performance.

The respondents strongly agree that peer accountability motivates them to enhance their research performance and helps them present research outputs with encouragement from classmates. They also strongly agree that mutual accountability reduces anxiety in research activities, sustains commitment and engagement through shared responsibility, and promotes positive attitudes toward learning and research.
The extent of peer coaching in terms of mutual accountability attained a weighted mean of 4.75 with a standard deviation of 0.43, verbally interpreted as Very Great Extent. This indicates that shared responsibility among peers plays a significant role in maintaining motivation, engagement, and commitment in research tasks. This further implies that accountability within a

Zairra Mae Perilla Villanueva, "The Role of Peer Coaching in Developing Students' Engagement and Competence in Science Research," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 9, Issue 1, pp. 311-319, June 2026.

group fosters responsibility and strengthens collaboration among students.

Table 4. Extent of the Role of Peer Coaching as perceived by Senior High School Students in terms of Mutual Accountability

Statement Through mutual accountability, I can…	Mean	SD	Remarks
…exhibit motivation to enhance research performance through peer accountability	4.76	0.43	Strongly Agree
…present research outputs with classmates' encouragement	4.76	0.43	Strongly Agree
…reduce anxiety in research activities through peer accountability.	4.80	0.40	Strongly Agree
…affirm that shared responsibility sustains commitment and engagement in research.	4.60	0.49	Strongly Agree
…promote peer accountability to foster positive attitudes toward learning and research.	4.82	0.39	Strongly Agree
Weighted Mean	4.75		
SD	0.43		
Verbal Interpretation	Very Great Extent		

The findings indicate that mutual accountability is an essential element of peer coaching. Through shared responsibility and encouragement, students are able to stay motivated, reduce anxiety, and actively engage in completing research-related activities.

Table 5 indicates that the extent of the Role of Peer Coaching as perceived by Senior High School Students in terms of sharing feedback. particularly, how it gives students sense of accomplishment, engage in constructive feedback and promote mutual learning to enhance clarity, accuracy and the quality of research work.

Table 5. Extent of the Role of Peer Coaching as perceived by Senior High School Students in terms of Sharing Feedback

Statement In giving and receiving constructive comments, I can…	Mean	SD	Remarks
…receive constructive feedback from peers on research ideas and outputs	4.78	0.42	Strongly Agree
use peer feedback to improve work and correct mistakes.	4.78	0.42	Strongly Agree
…interpret peer suggestions to enhance clarity of the research paper.	4.80	0.40	Strongly Agree
…value opportunities to give and receive feedback for mutual learning.	4.68	0.47	Strongly Agree
…exchange feedback to promote continuous improvement in research.	4.84	0.37	Strongly Agree
Weighted Mean	4.78		
SD	0.42		
Verbal Interpretation	Very Great Extent		

Notably, the respondents strongly agree that they receive constructive feedback from peers on research ideas and outputs and use this feedback to improve their work and correct mistakes. They also strongly agree that they interpret peer suggestions to enhance clarity, value opportunities for mutual learning, and exchange feedback to promote continuous improvement in research.

The extent of peer coaching in terms of sharing feedback attained a weighted mean of 4.78 with a standard deviation of 0.42, verbally interpreted as Very Great Extent. This indicates that feedback exchange among peers is highly beneficial in improving the quality of research outputs and enhancing students' understanding. This further implies that constructive feedback fosters continuous learning, critical thinking, and refinement of research skills.

The findings suggest that sharing feedback is a crucial component of peer coaching. Through constructive comments, mutual learning, and continuous improvement, students are able to enhance the clarity, accuracy, and overall quality of their research work.

Level of Students' Engagement in Science Research

In this study, the level of Students' Engagement in Science Research as perceived by Senior High School Students refers to Active Participation, Motivation, Task Commitment and Self-Regulation.

The level of Students' Engagement in Science Research as perceived by Senior High School Students is revealed in the following table, which shows the statement, mean, standard deviation, remarks, and verbal interpretation.

Table 6 shows the level of Students' Engagement in Science Research as perceived by Senior High School students in terms of Active Participation, specifically highlighting how the students participate in involvement in related research task.

Table 6. Level of Students' Engagement in Science Research as Perceived by Senior High School Students in terms of Active Participation.

Statement Through active participation, as a student, I…	Mean	SD	Remarks
…contribute ideas and insights during research discussions with peers.	4.66	0.48	Strongly Agree
…engage in all research activities and tasks to ensure responsibility and collaboration.	4.80	0.40	Strongly Agree
…explore how involvement supports deeper understanding of research concepts.	4.76	0.43	Strongly Agree
…take part in group activities because shared learning experiences are valued.	4.76	0.43	Strongly Agree
…value classroom discussions where everyone is encouraged to participate equally.	4.82	0.39	Strongly Agree
Weighted Mean	4.76		
SD	0.43		
Verbal Interpretation	Very High		

The findings revealed that respondents strongly agree that they contribute ideas and insights during research discussions and actively engage in all research activities to ensure collaboration and responsibility. They also strongly agree that participation helps deepen their understanding of research concepts, encourages involvement in group activities, and promotes equal participation in classroom discussions.

The level of students' engagement in terms of active participation attained a weighted mean of 4.76 with a standard deviation of 0.43, verbally interpreted as Very High. This indicates that students are actively involved in research-related tasks and collaborative learning activities. This further implies that active participation enhances understanding, cooperation, and meaningful learning experiences in science research.

The findings indicate that active participation is a key component of student engagement. Through involvement in discussions and collaborative tasks, students are able to develop deeper understanding and strengthen their role in the research process.

Table 7 presents the level of Students' Research Competence in Science Research as perceived by Senior High School students in terms of Motivation. Specifically, it highlights how the students sustain challenging tasks, maintain focus, enthusiasm and demonstrate commitment in terms of scientific research task.

Table 7. Level of Students' Engagement in Science Research as Perceived by Senior High School Students in terms of Motivation

Statement During the process of making the research, as a student, I..	Mean	SD	Remarks
…express excitement to learn more about scientific research and discovery	4.68	0.47	Strongly Agree
…demonstrate excitement to learn more about scientific research and discovery.	4.84	0.37	Strongly Agree
…affirm that passion for learning motivates greater effort in every research activity.	4.70	0.46	Strongly Agree
…maintain focus and enthusiasm about research when tasks become challenging.	4.72	0.45	Strongly Agree
…analyze new ideas in research to enhance understanding and achieve success.	4.80	0.40	Strongly Agree
Weighted Mean	4.75		
SD	0.43		
Verbal Interpretation	Very High		

Clearly, the respondents strongly agree that they express excitement in learning scientific research and demonstrate enthusiasm in discovering new ideas. They also strongly agree that passion for learning motivates greater effort, helps maintain focus during challenging tasks, and supports deeper understanding and achievement in research activities.

The level of students' engagement in terms of motivation attained a weighted mean of 4.75 with a standard deviation of 0.43, verbally interpreted as Very High. This indicates that students possess strong intrinsic motivation in conducting research activities. This further implies that enthusiasm and interest play a significant role in sustaining engagement and improving performance in science research.

The findings indicate that motivation is an essential factor in student engagement. Through sustained interest and enthusiasm, students are able to remain focused, persistent, and committed to completing research tasks effectively. It also encourages students to develop confidence and maintain active involvement throughout the research process. Ultimately, motivation serves as a driving force that transforms engagement into meaningful and productive research outcomes.

Table 8 shows the level of Students' Engagement in Science Research as perceived by Senior High School students in terms of Task Commitment. Specifically, it highlights how students demonstrate persistence, responsibility, and consistency in completing research-related tasks, how well it relates to maintain consistency in performing task by collaborating with peers.

Clearly, respondents strongly agree that they complete assigned research tasks on time and actively contribute to group work through collaboration and idea sharing. They also strongly agree that they remain dedicated even when tasks become demanding, ensure accuracy and reliability in their contributions, and maintain consistency in performing tasks to achieve group success.

Table 8. Level of Students' Engagement in Science Research as Perceived by Senior High School Students in terms of Task Commitment

Statement To demonstrate persistence and responsibility by completing tasks diligently., as a student, I…	Mean	SD	Remarks
…complete every assigned task in the research project on time.	4.78	0.42	Strongly Agree
…contribute to group research by sharing ideas, collaborating with peers, and supporting goals.	4.76	0.43	Strongly Agree
…remain dedicated to assigned duties when work becomes demanding.	4.84	0.37	Strongly Agree
…ensure research contributions are accurate and reliable.	4.64	0.48	Strongly Agree
…maintain consistency in performing tasks to support group success	4.92	0.27	Strongly Agree
Weighted Mean	4.79		
SD	0.41		
Verbal Interpretation	Very High		

The level of students' engagement in terms of task commitment attained a weighted mean of 4.79 with a standard deviation of 0.41, verbally interpreted as Very High. This indicates that students demonstrate a high level of responsibility, persistence, and dedication in completing research activities. This further implies that strong commitment contributes to the successful completion and quality of research outputs.

The findings indicate that task commitment is a vital element of student engagement. Through responsibility, persistence, and consistency, students are able to effectively accomplish research tasks and contribute to group success.

Table 9 shows the level of Students' Engagement in Science Research as perceived by Senior High School students in terms of Self-Regulation. Specifically, how it highlights students' ability to manage their time, monitor their progress, sustain motivation and control distractions, how it assists learners to reflect on their strengths and weaknesses in monitoring their progress to stay on track achieving their research goals.

Table 9. Level of Students' Engagement in Science Research as perceived by Senior High School Students in terms of Self-Regulation

Statement When applying self-regulation, as a student, I…	Mean	SD	Remarks
…manage time to balance research work with other academic responsibilities	4.68	0.47	Strongly Agree
…monitor progress to stay on track with research goals	4.84	0.37	Strongly Agree
…motivate self to remain productive without external supervision.	4.78	0.42	Strongly Agree
…control distractions and focus on completing research tasks.	4.74	0.44	Strongly Agree
…reflect on strengths and weaknesses to improve performance in research activities.	4.86	0.35	Strongly Agree
Weighted Mean	4.78		
SD	0.41		
Verbal Interpretation	Very High		

Evidently, it shows that the level of students' engagement in science research as perceived by senior high school students in terms of self-regulation. Respondents strongly agree that they manage their time effectively to balance research and academic responsibilities and monitor their progress to stay aligned with research goals. They also strongly agree that they motivate themselves to remain productive, control distractions, and reflect on their strengths and weaknesses to improve performance.

The level of students' engagement in terms of self-regulation attained a weighted mean of 4.78 with a standard deviation of 0.41, verbally interpreted as Very High. This indicates that students are capable of managing their learning processes independently and effectively. This further implies that self-regulation enhances productivity, focus, and continuous improvement in research activities.

The findings suggest that self-regulation is an important component of student engagement. Through time management, self-motivation, and reflection, students are able to take control of their learning and improve their performance in science research. Ultimately, self-regulation empowers learners to sustain focus and achieve meaningful research outcomes.

Level of Students' Research Competence in Science Research as Perceived by Senior High School Students

In this study, the level of Students' Research Competence in Science Research as Perceived by Senior High School Students refers to Research Planning, Formulating Research Question and, Preparing of Research Methodology.

The level of Students' Research Competence in Science Research as Perceived by Senior High School Students is revealed in the following table, which shows the raw score, frequency, percentage, mean, standard deviation, and verbal interpretation.

The Table 10 shows the level of students' research competence in science research as perceived by Senior High School students in terms of research planning. Specifically, it shows how research planning enables students to plan effectively in students research task.

Table 10. Level of Students' Research Competence in Science Research as Perceived by Senior High School Students in terms Research Planning

Score	Frequency (f)	Percentage (%)	Verbal Interpretation
9.7-12	49	98	Outstanding
7.3-9.6	1	2	Very Satisfactory
4.9-7.2	0	0	Satisfactory
2.5 -4.8	0	0	Fair
1-2.4	0	0	Needs Improvement
Total	50	100	
Mean		11.82	
SD		0.63	
Verbal Interpretation		Very Satisfactory	

The data present the level of students' research competence in science research as perceived by senior high school students in terms of research planning. The majority of the respondents, comprising 98%, are classified under the Outstanding level, while only 2% fall under the Very Satisfactory level. No respondents were categorized under satisfactory, fair, or needs improvement levels. This indicates that most students demonstrate a very high level of competence in planning their research activities. The outstanding results obtained by the respondents may be attributed to the scoring rubric utilized in the study, which systematically assessed students' competence in research planning. The consistently high scores indicate that most students were able to meet the established criteria effectively, reflecting their strong capability in Research Planning.

The level of students' research competence in terms of research planning obtained a mean score of 11.82 with a standard deviation of 0.63, verbally interpreted as outstanding. This indicates that students possess strong skills in organizing, structuring, and preparing research tasks effectively. The relatively low standard deviation further implies that responses are closely clustered, indicating consistency in students' high level of competence.

The findings indicates that students exhibit outstanding research planning skills. Their ability to organize ideas, prepare procedures, and plan research activities effectively contributes to the successful execution of science research tasks and overall academic performance.

The Table 11 shows the level of Students' Research Competence in Science Research as perceived by Senior High School students in terms of Formulating Research Questions and how it connects to the interest of the students in establishing a strong foundation for their research studies.

Table 11. Level of Students' Research Competence in Science Research as Perceived by Senior High School Students in terms Formulating Research Question

Score	Frequency (f)	Percentage (%)	Verbal Interpretation
9.7-12	49	98	Outstanding
7.3-9.6	1	2	Very Satisfactory
4.9-7.2	0	0	Satisfactory
2.5 -4.8	0	0	Fair
1-2.4	0	0	Needs Improvement
Total	50	100	
Weighted Mean		11.80	
SD		.64	
Verbal Interpretation		Outstanding	

The level of students' research competence in science research as perceived by senior high school students in terms of formulating research questions. The majority of the respondents, comprising 98%, are classified under the Outstanding level, while only 2% fall under the Very Satisfactory level. No respondents were categorized under satisfactory, fair, or needs improvement levels. This indicates that most students demonstrate a very high level of competence in developing clear and relevant research questions. The scoring rubric used in the study served as the basis for evaluating the quality, clarity, relevance, and feasibility of the formulated research questions, ensuring that students' outputs were assessed systematically and objectively according to established criteria.

The level of students' research competence in terms of formulating research questions obtained a mean score of 11.80 with a standard deviation of 0.64, verbally interpreted as Outstanding. This suggests that students are highly capable of

Zairra Mae Perilla Villanueva, "The Role of Peer Coaching in Developing Students' Engagement and Competence in Science Research," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 9, Issue 1, pp. 311-319, June 2026.

identifying research problems, constructing appropriate questions, and establishing a strong foundation for their research studies. The low standard deviation further implies consistency in the respondents' high level of competence.

In summary, the findings suggest that students exhibit outstanding skills in formulating research questions. Their ability to clearly define research problems and generate meaningful inquiries contributes to the overall quality and direction of their science research.

The Table 12 shows the level of Students' Research Competence in Science Research as perceived by Senior High School students in terms of Preparing Research Methodology. Specifically, how the students construct and prepare appropriate research methodology.

Table 12. Level of Students' Research Competence in Science Research as Perceived by Senior High School Students in terms Preparing of Research Methodology

Score	Frequency (f)	Percentage (%)	Verbal Interpretation
9.7-12	48	96	Outstanding
7.3-9.6	2	4	Very Satisfactory
4.9-7.2	0	0	Satisfactory
2.5 -4.8	0	0	Fair
1-2.4	0	0	Needs Improvement
Total	50	100	
Weighted Mean		11.72	
SD		0.83	
Verbal Interpretation		Outstanding	

The majority of the respondents, comprising 96%, are classified under the Outstanding level, while 4% fall under the Very Satisfactory level. No respondents were categorized under satisfactory, fair, or needs improvement levels. This indicates that most students demonstrate a very high level of competence in designing and preparing appropriate research methodologies.

The level of students' research competence in terms of preparing research methodology obtained a mean score of 11.72 with a standard deviation of 0.83, verbally interpreted as Outstanding. This indicates that students are highly capable of selecting suitable research designs, procedures, and methods to address their research problems. The relatively low standard deviation further implies that responses are closely grouped, indicating consistency in students' competence.

The findings indicates that students exhibit outstanding skills in preparing research methodology. Their ability to design systematic and appropriate methods contributes to the accuracy, reliability, and overall quality of their science research outputs.

Significant Relationship Between the Role of Peer Coaching and the Students' Engagement in Science Research as Perceived by Senior High School Students

In this study, the Role of Peer Coaching as Perceived by Senior High School Students refers to Communicating Actively, Planning Collaboratively, Sharing Knowledge, Mutual Accountability and Sharing Feedback while the Students' Engagement in Science Research as perceived by Senior High School Students refers to active participation, motivation, task commitment and self-regulation. Together, these constructs establish the basis for analyzing how collaborative practices influence the relational and motivational dimensions of research engagement. Ultimately, this framework highlights the interrelation of peer support and student engagement in achieving meaningful research outcomes

The Significant Relationship between the Significant Relationship Between the Role of Peer Coaching and the Students' Engagement in Science Research as Perceived by Senior High School Students is revealed in the following table, which shows the Multiple Regression Analysis using Pearson Product Moment Correlation Coefficient or Pearson-r, p-value, and number of observation or respondents. The analysis underscores how peer coaching practices statistically contribute to higher levels of student engagement in research activities

The Table 13 shows the Significant Relationship Between the Role of Peer Coaching and the Students' Engagement in Science Research as Perceived by Senior High School Students. This finding emphasizes that peer coaching practices—such as active communication, collaborative planning, knowledge sharing, mutual accountability, and feedback.

Table 13. Significant Relationship Between the Role of Peer Coaching and the Students' Engagement in Science Research as Perceived by Senior High School Students

Role of Peer Coaching		Students' Engagement in Science Research			
		Active Participation	Motivation	Task Commitment	Self-Regulation
Communicating Actively	Pearson Correlation	0.146	0.179	0.034	0.133
	Sig. (2-tailed)	0.311	0.213	0.816	0.357
	N	50	50	50	50
Planning Collaboratively	Pearson Correlation	0.090	0.188	0.146	0.179
	Sig. (2-tailed)	0.534	0.191	0.311	0.214
	N	50	50	50	50
Sharing Knowledge	Pearson Correlation	0.033	0.283	0.199	0.000
	Sig. (2-tailed)	0.818	0.047	0.167	1.000
	N	50	50	50	50
Mutual Accountability	Pearson Correlation	0.129	0.203	0.276	0.168
	Sig. (2-tailed)	0.370	0.156	0.053	0.245
	N	50	50	50	50
Sharing Feedback	Pearson Correlation	0.057	0.046	0.046	0.328*
	Sig. (2-tailed)	0.693	0.750	0.751	0.020
	N	50	50	50	50

The findings show the significant relationship between the role of peer coaching and students' engagement in science research across four domains: active participation, motivation, task commitment, and self-regulation. Using Pearson Product Moment Correlation with 50 respondents, the analysis determined whether peer coaching practices are significantly

Zairra Mae Perilla Villanueva, "The Role of Peer Coaching in Developing Students' Engagement and Competence in Science Research," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 9, Issue 1, pp. 311-319, June 2026.

associated with students' level of engagement in research activities.

The results reveal that most dimensions of peer coaching communicating actively, planning collaboratively, sharing knowledge, and mutual accountability show weak and non-significant relationships with the different domains of students' engagement. The correlations are generally low, indicating limited association between peer coaching practices and students' active participation, task commitment, and self-regulation.

However, specific dimensions such as sharing knowledge and motivation, as well as sharing feedback and self-regulation, exhibit significant relationships, suggesting that these aspects of peer coaching play a more meaningful role in enhancing students' engagement behaviors. These findings imply that while peer coaching is perceived as highly effective, only selected components, particularly those involving knowledge exchange and constructive feedback, contribute significantly to students' motivation and ability to regulate their learning. Overall, the findings indicate that specific dimensions of peer coaching—particularly knowledge sharing and constructive feedback—play a pivotal role in enhancing students' engagement and self-regulatory behaviors in science research. Moreover, the results emphasize the value of collaborative interaction and supportive feedback in fostering active participation and cultivating meaningful learning experiences among students

In summary, the findings demonstrate that the relationship between peer coaching and students' engagement is partially supported. Peer coaching does not consistently influence all aspects of engagement, but targeted practices such as sharing knowledge and providing feedback serve as important mechanisms in fostering motivation and self-regulation. The results signify that peer coaching functions as a supportive but selective system, where not all strategies equally impact student engagement. Strengthening key elements like feedback exchange and collaborative knowledge sharing may enhance its overall effectiveness in promoting deeper and more sustained engagement in science research. Moreover, the relationship underscores how peer coaching fosters a supportive and collaborative environment that not only enhances interpersonal connections but also strengthens academic competencies, these findings highlight the need for more focused and strategic implementation of peer coaching practices to maximize student engagement outcomes.

Significant Effect Between the Role of Peer Coaching on the Students' Engagement in Science Research as Perceived by Senior High School Students

In this study, the Role of Peer Coaching as perceived by Senior High School Students refers to Communicating Actively, Placing Collaboratively, Sharing Knowledge, Mutual Accountability and Sharing Feedback while the Students' Research Competence in Science Research as perceived by Senior High School Students refers to research planning, formulating research question and, preparing of research methodology. These variables were examined to determine the effect to which peer coaching influences students' research competence in conducting science research activities.

The Table 14 shows the Significant Effect Between the Role of Peer Coaching on the Students' Engagement in Science Research as Perceived by Senior High School Students.

Table 14. Significant Effect between the Authentic Text Integration on the Learners' Integrated Process Skills

Role of Peer Coaching		Students' Research Competence in Science Research Planning	Formulating Research Question	Preparing of Research Methodology
Communicating Actively	t-value	1.128	-0.392	0.518
	Sig. (2-tailed)	0.265	0.697	0.607
	N	50	50	50
Planning Collaboratively	t-value	-0.182	-0.182	-0.260
	Sig. (2-tailed)	0.856	0.856	0.796
	N	50	50	50
Sharing Knowledge	t-value	1.000	-0.248	-0.354
	Sig. (2-tailed)	0.322	0.806	0.725
	N	50	50	50
Mutual Accountability	t-value	-1.729	-1.729	-1.479
	Sig. (2-tailed)	0.090	0.090	0.146
	N	50	50	50
Sharing Feedback	t-value	-1.344	-0.141	-1.056
	Sig. (2-tailed)	0.185	0.888	0.296
	N	50	50	50

The table presented shows that the significant effect between the role of peer coaching and students' research competence in science research across three domains: research planning, formulating research questions, and preparing research methodology. Using t-test analysis with 50 respondents, the analysis determined whether peer coaching practices significantly influence students' research competence.

The results reveal that all dimensions of peer coaching—communicating actively, planning collaboratively, sharing knowledge, mutual accountability, and sharing feedback—show no significant effect on students' research competence across all domains. The computed t-values are low, and the corresponding significance values indicate non-significant results. This indicates that variations in peer coaching practices do not significantly influence students' ability to plan research, formulate research questions, or prepare research methodology. Furthermore, the results imply that peer coaching may contribute more to students' engagement and collaboration rather than to the development of technical research competencies. This underscores the importance of structured teaching and individual initiative in shaping research competence. These findings suggest that research competence may be more strongly influenced by individual abilities, formal instruction, and teacher guidance than by peer coaching alone.

Zairra Mae Perilla Villanueva, "The Role of Peer Coaching in Developing Students' Engagement and Competence in Science Research," *International Journal of Multidisciplinary Research and Publications (IJMRAP)*, Volume 9, Issue 1, pp. 311-319, June 2026.

These findings imply that although peer coaching is perceived as highly effective in earlier results, it does not directly translate into measurable improvements in students' research competence. Students may already possess high levels of competence regardless of peer coaching, or other factors such as prior knowledge, teacher guidance, and individual abilities may play a more dominant role in developing research skills.

In summary, the findings demonstrate that the role of peer coaching does not have a significant effect on students' research competence in science research. While peer coaching contributes to collaboration and engagement, it does not significantly impact technical research skills such as planning, question formulation, and methodology preparation. The development of research competence may depend more on individual abilities, teacher guidance, and formal research instruction than on peer coaching alone. This suggests that peer coaching functions more as a supportive learning strategy rather than a primary determinant of research competence. Therefore, integrating peer coaching into science education should be viewed as a complementary approach that enhances engagement, while formal instruction remains essential for building core research skills.

IV. Conclusion and Recommendations

The analysis revealed that certain dimensions of peer coaching, specifically sharing knowledge and sharing feedback, are significantly associated with students' self-regulation thus, the research hypothesis is accepted. This indicates that structured peer coaching in these areas enhances specific aspects of students' engagement in science research. It further implies that when students actively share knowledge and exchange feedback, they become more capable of regulating their learning processes in research activities.

The data showed that none of the dimensions of peer coaching produced a statistically significant effect on students' research planning, formulation of research questions, or preparation of methodology, thus this hypothesis is accepted. This indicates that peer coaching alone does not significantly influence the development of students' research competence in science.

Based on the drawn conclusions resulted to the following recommendations:

Curriculum Developers may be advised to incorporate peer-assisted learning strategies into the research curriculum to promote collaborative skills while maintaining opportunities for independent research competence.

School Administrators may recommend to provide supportive frameworks and resources, such as research workshops, mentoring programs, and guided activities, to strengthen students' engagement and peer coaching.

Teachers and Mentors may integrate structured peer coaching activities, focusing on knowledge sharing, collaborative planning, and constructive feedback, to enhance students' active participation, motivation, task commitment, and self-regulation in science research.

Parents and Guardians may support students' research involvement at home by providing time, guidance, and encouragement for group discussions and research activities.

Future Researchers may investigate additional instructional methods or factors, such as teacher scaffolding, technology-assisted collaboration, and inquiry-based approaches, that may further enhance the impact of peer coaching on students' research competence in Senior High School.

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