Research Proficiency, Challenges, and Engagement of BSED Science Students

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ABSTRACT

As research plays a significant role in shaping competent educators, particularly in the field of science education, strengthening students' research skills, understanding the challenges they face, and encouraging active engagement are essential in preparing them for evidence-based teaching. This descriptive-correlational study explored the levels of research proficiency, challenges encountered, and engagement among Bachelor of Secondary Education (BSEd) Science students. A total of 51 students, randomly selected from various campuses of Capiz State University (CAPSU), participated in the study. Data were gathered using a researcher-developed questionnaire and analyzed through mean, standard deviation, and Spearman's rho at a 0.05 level of significance. Findings revealed that the students demonstrated proficiency in several aspects of the research process, including problem formulation, data collection, analysis and interpretation, presentation of findings, drawing conclusions, and referencing. However, despite this proficiency, students also reported facing challenges in the same areas—highlighting the need for continued support in bridging theoretical understanding with practical application. The results also showed that students were actively engaged in research, both in their academic coursework and other scholarly activities. A significant relationship emerged between students' engagement and both their proficiency and the challenges they experienced. This suggests that active engagement may help students develop stronger research competencies, even when faced with difficulties. Interestingly, no significant relationship was found between research challenges and overall research proficiency. The study emphasizes the importance of promoting meaningful research engagement to enhance the capabilities of future science educators.

Keywords: Research proficiency, challenges, engagement, BSEd Science, research education

INTRODUCTION

The implementation of Republic Act No. 10533, or the Enhanced Basic Education Act of 2013, brought about a major shift in the Philippine education system by extending basic education from 10 to 13 years. The K to 12 program, which added Kindergarten and Grades 11 and 12, aimed to better prepare learners for higher education, employment, and lifelong learning (Estacio, 2015). As part of this reform, new subjects were introduced to help develop essential 21st-century skills—among them, Practical Research, which provides students with basic training in conducting both qualitative and quantitative research. In this subject, students are taught how to identify research problems, collect and analyze data, and draw meaningful conclusions based on evidence. However, while the curriculum is designed with clear outcomes in mind, the actual development of research proficiency among students remains uneven.

Several studies point to key factors that influence how students build research skills. Balloo et al. (2016) found that motivation, self-regulation, and research self-efficacy significantly influence research knowledge and competence. Yet the strongest predictor was students' actual practice of research methods—a reminder that proficiency improves through application. In the Philippine context, Mallari and Santiago (2024) emphasized

that research competence involves not only technical skills but also critical thinking and the ability to question and analyze disciplinary practices. Meanwhile, Caliwan (2017) found that while teacher education students may be familiar with writing the different parts of a research paper, issues like limited time, scheduling conflicts, and lack of mentorship can hold back their progress.

Other challenges are less visible but just as impactful. Dwihandini et al. (2013) and Aragon et al. (2015) identified psychological barriers such as low motivation, poor self-management, and difficulty accepting feedback as common obstacles in student research. Language-related difficulties—especially in grammar, sentence construction, and vocabulary choice—also affect how students write and express their ideas (Alfaki, 2015). On top of these, weak support systems, especially in terms of adviser communication and peer collaboration, contribute to the struggles students face in completing research requirements.

Despite these difficulties, research remains a vital part of teacher education. Universities are expected not only to deliver content but also to shape future educators who are capable of critical inquiry and evidence-based practice (Safari et al., 2018). Preparing students for this role begins with understanding their current level of research knowledge, the barriers they face, and how engaged they are in the research process.

This study aims to assess the research proficiency, challenges, and engagement of BSEd Science students, taking into account their prior exposure to Practical Research during senior high school. Findings from this study may help in designing more effective teaching strategies to better support students in developing their research skills, confidence, and mindset.

Specifically, this study aimed to answer the following questions:

1. What is the level of students' research proficiency in terms of:
   a. formulating the research problem;
   b. data gathering;
   c. analysis, interpretation, and presentation of data;
   d. making conclusions and recommendations, and
   e. referencing?
2. What is the level of challenges experienced by the students' in doing research in terms of:

   a. formulating the research problem;
   b. data gathering;
   c. analysis, interpretation, and presentation of data;
   d. making conclusions and recommendations;
   e. referencing?
3. What is the level of students' engagement in research?
4. Is there a significant relationship between the level of students' research proficiency and challenges?
5. Is there a significant relationship between the level of students' research proficiency and engagement?
6. Is there a significant relationship between the level of challenges and engagement?

METHODOLOGY

This study employed a descriptive-correlational research design to examine whether a significant relationship exists among research proficiency, challenges, and engagement of BSEd Science students in Capiz. According to Creswell, as cited in Kharbach (2023), correlational research is used to test objective theories by exploring relationships among variables, which are typically measured using instruments and analyzed through statistical procedures.

To gather the necessary data, the researchers utilized a one-shot survey design and administered a researcher-made questionnaire. This instrument was designed to assess the students' self-reported levels of research proficiency, the challenges they encountered, and their degree of engagement in conducting research.

The descriptive component of the study aimed to provide a detailed overview of the students' experiences and capabilities related to research. According to Shuttleworth and Wilson (2024), descriptive research focuses on observing and describing behaviors or characteristics without manipulating the variables. Meanwhile, the correlational aspect of the study examined potential associations among the three main variables, proficiency, challenges, and engagement, to provide insights that could inform strategies for improving research instruction and support.

Sample Size and Sampling Procedure

The participants of this study were second-year Bachelor of Secondary Education (BSEd) Science students from three campuses of Capiz State University with a total population of fifty-eight (58) students. Using Cochran's formula, the required minimum sample size was determined to be fifty-one (51). A proportionate number of respondents were drawn from each campus, and the final participants were selected using simple random sampling to ensure equal representation and reduce sampling bias.

This study strictly adhered to institutional ethical guidelines for conducting research involving human participants. Prior to data collection, all stakeholders including school administrators, teachers, and parents were fully informed of the study's objectives, methodology, and potential implications. Informed consent was obtained through written consent forms signed by the participants and their guardians. To ensure confidentiality and protect personal information, all data collected, such as names, were replaced with anonymous codes throughout the research process.

Research Instrument

To gather the necessary data, the researchers developed a researcher-made checklist. The instrument was composed of four parts. The first part collected basic information about the respondents, including their name (optional), age, sex, school or university, and year level. The second part focused on research proficiency, consisting of 50 items grouped under five key areas: formulating the research problem, data gathering, analysis, interpretation and presentation of data, making conclusions and recommendations, and lastly, referencing. The third part assessed the challenges encountered by students in conducting actual research. It also had 50 items covering the same five categories. Lastly, the fourth part measured students' engagement in research through 10 statement items.

To ensure the instrument was valid and appropriate for the study, it was reviewed by a panel of three experts consisting of science educators with at least a master's degree and an expert in the field of research. Their feedback was carefully considered, and necessary revisions were made before the final version was used. A pilot test was also conducted with second-year BSEd Science students from one of the campuses of Capiz State University who were not part of the main sample. The reliability of the instrument was tested using Cronbach's Alpha. The research proficiency section showed a reliability coefficient of 0.953, the challenges section yielded 0.992, and the research engagement section scored 0.931. These results indicate excellent reliability. Based on Taber's (2018) standard, a reliability score of 0.70 or higher is considered acceptable in social science research, confirming that the tool used in this study was both reliable and consistent.

Data Analysis Procedure

The data collected in this study were analyzed based on the three main variables: research proficiency, challenges, and engagement of the BSEd Science students. Descriptive statistics, specifically the mean and standard deviation, were used to determine the overall levels and the variability of responses among participants. The mean helped establish the average responses for each variable, while the standard deviation indicated the degree of consistency or variation in students' answers. To explore the relationships among the variables, Spearman's rho correlation was employed as an appropriate non-parametric statistical test. This inferential analysis assessed whether significant relationships existed among students' levels of research proficiency, the challenges they encountered, and their engagement in the research process. All statistical

analyses were carried out using the Statistical Package for the Social Sciences (SPSS). The significance level for all inferential tests was set at 0.05 to ensure the reliability and validity of the findings.

RESULTS AND DISCUSSION

Research Proficiency Level of BSEd Science Students

The findings of the study show that the BSEd Science students generally have a proficient level of research proficiency M=4.42, SD= 0.30). This means that most students are capable of understanding and performing essential research tasks.

When analyzed into specific areas, the students also showed proficient level across all five categories. Students performed best in formulating research problems (M = 4.49, SD = 0.30) and gathering data (M = 4.49, SD = 0.28), which suggests they are confident in starting a research study and collecting the needed information. Their scores in referencing (M = 4.33, SD = 0.41), analyzing and interpreting data (M = 4.42, SD = 0.38), and writing conclusions and recommendations (M = 4.40, SD = 0.38) also fell within the proficient range, although referencing showed slightly lower scores, indicating a need for more support in this area.

These results show that students can already apply basic research processes such as analyzing information, review data, and come up with meaningful conclusions. However, there is still room for growth especially in improving how they cite sources and present their findings more accurately.

This supports the findings of Ivanenko et al. (2015), who emphasized that research competence involves identifying problems, organizing solutions, and analyzing results clearly. Being proficient in research helps students build important skills they can use in school, work, and everyday life.

Table 1 Research Proficiency Levels of BSEd Science Students

Research Proficiency	M	SD	VI
Formulating the research problem	4.49	0.30	Proficient
Data gathering	4.49	0.28	Proficient
Referencing	4.33	0.41	Proficient
Analysis, interpretation and presentation of data	4.42	0.38	Proficient
Making conclusions and recommendations	4.40	0.38	Proficient
Overall	4.42	0.30	Proficient

Note. Interpretation is based on the following scale: 4.50-5.00 (Very Proficient), 3.50-4.49 (Proficient), 2.50 - 3.49 (Moderately Proficient), 1.50 - 2.49 (Less Proficient), and 1.00 – 1.49 (Not Proficient).

Level of Students' Research Proficiency in Terms of Formulating the Research Problem

Table 2 shows how BSEd Science students performed in terms of formulating research problems. Overall, students were found to be proficient in this area (M = 4.49, SD = 0.30).

Among the specific skills assessed, the students were very proficient in the following: double-checking information and relying on credible sources (M = 4.76, SD = 0.42), focusing on providing relevant ideas in their research (M = 4.71, SD = 0.45), and identifying issues in their surroundings as a basis for choosing research problems (M = 4.64, SD = 0.48). These top-rated responses suggest that students are mindful of the quality and relevance of their research topics.

On the other hand, the statements that received relatively lower though still "proficient" ratings were: reading various literature to better understand their topic (M = 4.42, SD = 0.61), becoming familiar with research processes like study design and sampling when formulating a problem (M = 4.25, SD = 0.75), and creating a

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research title based on observed gaps (M = 4.06, SD = 0.30). These indicate that while students are capable of forming research problems, they still need to strengthen their foundation in reviewing related literature and understanding research design.

These results show that students are on the right track in identifying and formulating research problems. They can gather and analyze information and use it to create meaningful research topics. However, to reach a higher level of proficiency, they must continue improving their skills in framing titles and connecting their topics more clearly to existing research gaps.

Furthermore, formulating a clear research problem is a crucial step in the research process. It guides students in choosing the right research design, methods, and tools for data collection. It also encourages critical thinking, as students learn to identify what is missing in current knowledge and how their study can help fill that gap.

This aligns with the findings of Pardede (2018), who emphasized that students proficient in formulating research problems are better able to focus their studies and present the relevance of their chosen topic. By clearly defining the problem, researchers set the direction for the entire study and ensure that the results they present later are grounded in a well-thought-out purpose.Bottom of Form

Table 2 Level of Students' Research Proficiency in Terms of Formulating the Research Problem

Statement	M	SD	VI
1. I double check all informations and makes sure to follow reliable sources.	4.76	0.42	Very Proficient
2. I make sure that the main focus of my research paper is to provide relevant information or ideas.	4.71	0.45	Very Proficient
3. I consider the relevant issues happening in our surroundings that need to be addressed in identifying my research problem.	4.64	0.48	Very Proficient
4. I consider the relevance of my research problem before proceeding to the next step.	4.54	0.53	Very Proficient
5. I make sure to explore the nature of the problem before continuing the next process.	4.54	0.50	Very Proficient
6. As I formulate the research problem I make sure to determine the independent and dependent variables in my study.	4.51	0.50	Very Proficient
7. I make sure that the research problem that I formulate is manageable, testable and meaningful by doing a thorough background checking on the subject.	4.48	0.59	Proficient
8. I read different literature to gain better understanding of existing researches and debates relevant to a particular topic or area of study that I want to focus on.	4.42	0.61	Proficient
9. I identify and familiarize the different steps of the research process such the study design, sampling strategy, and research instrument as I formulate the research problem.	4.25	0.75	Proficient
10. I can formulate research title out of the gap that I have observed.	4.06	0.58	Proficient
Overall	4.49	0.30	Proficient

Note. Interpretation is based on the following scale: 4.50-5.00 (Very Proficient), 3.50-4.49 (Proficient), 2.50 - 3.49 (Moderately Proficient), 1.50 - 2.49 (Less Proficient), and 1.00 – 1.49 (Not Proficient).

Level of Students' Research Proficiency in Terms of Data Gathering

The results presented in Table 3 show that the BSEd Science students are generally proficient when it comes to gathering data (M = 4.49, SD = 0.28). This suggests that they have a good understanding of how to properly collect data for their research.

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Among the skills assessed, students were very proficient in, ensuring that the data they collect directly answers their research questions (M = 4.64, SD = 0.51), maintaining the confidentiality of their respondents (M = 4.62, SD = 0.48), and using valid and reliable questionnaires (M = 4.60, SD = 0.49). These results show that students are aware of the importance of accuracy, ethical responsibility, and reliability in the research process.

However, some aspects of data gathering received slightly lower ratings, though still within the proficient range. These include preparing for the physical and financial requirements of data collection depending on location (M = 4.43, SD = 0.50), planning data collection methods ahead of time (M = 4.29, SD = 0.65), and estimating how long the data collection process will take (M = 4.28, SD = 0.54). This implies that while students are capable of collecting data effectively, there is room for improvement in planning and managing the practical aspects of data gathering.

Overall, the findings suggest that the students are responsible and logical when it comes to collecting data, which is essential for producing valid and credible research. Being proficient in data gathering allows them to follow systematic procedures, apply best practices, and ensure the quality of their research results. This supports Barrett's (2018) study, which emphasizes that using proper methods and being systematic in data gathering enables researchers to better understand their data and improve the overall quality and impact of their research work.

Table 3 Level of Students' Research Proficiency in Terms of Data Gathering

Statement	M	SD	VI
1. I make sure that the data I gathered can answer my research questions.	4.64	0.51	Very Proficient
2. I maintain the confidentiality of the gathered data to protect my respondents.	4.62	0.48	Very Proficient
3. I make sure that the questionnaires that will be used in collecting data are valid and reliable.	4.60	0.49	Very Proficient
4. I seek for permission from the higher officials before I gather data from my respondents.	4.56	0.53	Very Proficient
5. I ensure that the information I collect is accurate and reliable through a series of qualifications applicable to the specific set of data.	4.51	0.50	Very Proficient
6. After gathering the data I prepare it for the next step which is analysis and interpretation of the collected data.	4.50	0.59	Very Proficient
7. I set timeframe for data collection.	4.48	0.50	Proficient
8. I consider the locations or geographical areas from which the data be gathered to prepare myself physically and financially.	4.43	0.50	Proficient
9. I plan an approach and methods on how the data will be collected beforehand.	4.29	0.65	Proficient
10. I assessed how long will the data be collected.	4.28	0.54	Proficient
Overall	4.49	0.28	Proficient

Note. Interpretation is based on the following scale: 4.50-5.00 (Very Proficient), 3.50-4.49 (Proficient), 2.50 - 3.49 (Moderately Proficient), 1.50 - 2.49 (Less Proficient), and 1.00 – 1.49 (Not Proficient).

Level of Students' Research Proficiency in Terms of Analysis, Interpretation and Presentation of Data

The results presented in Table 4 show the level of research proficiency of BSEd Science students in terms of analysis, interpretation, and presentation of data. Overall, the students were found to be proficient in this area (M = 4.42, SD = 0.38). This suggests that they are generally capable of organizing and interpreting the data they collect, and of presenting it clearly and effectively.

Among the different indicators assessed, two statements were rated as very proficient. These were: "I organize my data before presenting it, to avoid confusion and to reduce errors" (M = 4.65, SD = 0.47) and "In analyzing my collected data, I make sure to go back to my literature review to check and link whether my findings are related to those from previous studies" (M = 4.54, SD = 0.58). These high scores indicate that students recognize the importance of structured data presentation and making connections between their findings and existing literature.

On the other hand, three indicators received slightly lower ratings, though still falling within the proficient range. These included: "I draw generalizations from analyzed and interpreted data" (M = 4.35, SD = 0.60), "I can now identify what statistical tool(s) I need to use in my study" (M = 4.32, SD = 0.77), and "In doing quantitative research, I convert the data gathered into numerical form and encode it to reduce the large quantity of data to a manageable size" (M = 4.10, SD = 0.69). These results suggest that while students have a good grasp of the basics, they may still need additional support or experience to strengthen their confidence and skills in statistical analysis and data encoding.

Overall, the findings indicate that students are capable of reviewing, analyzing, and interpreting data to arrive at meaningful conclusions. However, there is still room for growth, especially in areas involving statistical tool selection and deeper quantitative analysis. Enhancing these skills will not only improve their research outputs but also contribute to their academic success, critical thinking, and professional readiness.

The results align with the study by Anderson (2015), which highlighted the positive impact of undergraduate research involvement on student development. According to Anderson, engaging in research allows students to strengthen their information search strategies, deepen their understanding of subject matter, and build critical skills in analyzing and synthesizing data. These competencies are essential in preparing students for lifelong learning and informed decision-making in both academic and real-world contexts.

Table 4 Level of Students' Research Proficiency in Terms of Analysis, Interpretation and Presentation of Data

Statement	M	SD	VI
1. I organize my data before presenting it, to avoid confusion and to reduce errors.	4.65	0.47	Very Proficient
2. In analyzing my collected data I make sure to go back to my literature review to check and linked whether my findings is related to any of those findings from the previous studies.	4.54	0.58	Very Proficient
3. In presenting the results of my study I prefer to use tables, chart, graphs or diagram for easy understanding of content.	4.46	0.68	Proficient
4. I use appropriate data analysis, interpretation, and presentation techniques, to derive meaningful insights, make sense of these insights, and communicate the research findings effectively.	4.46	0.50	Proficient
5. I make sure to interpret my collected data correctly and accurately through the use of diverse analytical methods.	4.45	0.61	Proficient
6. I make sure to test the hypothesis as I analyze the gathered data.	4.43	0.68	Proficient
7. I draw generalization out of analyzed and interpreted data.	4.35	0.60	Proficient
8. I can now identify what statistical tool/s I need to use in my study.	4.32	0.77	Proficient
9. In doing quantitative research, I convert the data gathered to numerical form as encode it to reduce the huge quantity of data to a manageable proportion.	4.10	0.69	Proficient
Overall	4.42	0.38	Proficient

Note. Interpretation is based on the following scale: 4.50-5.00 (Very Proficient), 3.50-4.49 (Proficient), 2.50 - 3.49 (Moderately Proficient), 1.50 - 2.49 (Less Proficient), and 1.00 – 1.49 (Not Proficient).

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Level of Students' Research Proficiency in Terms of Making Conclusions and Recommendations

Presented in Table 5 is the research proficiency of the BSEd Science students in terms of making conclusions and recommendations.

Generally, results revealed that students are proficient in terms of making conclusions and recommendations (M = 4.40, SD = 0.38). This indicates that most students are able to interpret their research findings meaningfully and propose relevant recommendations based on their results.

Among the indicators, two statements received a very proficient rating. These were: "I ensure that my recommendations are written in clear and concise language, avoiding jargon or technical terms difficult to understand" (M = 4.64, SD = 0.48), and "I demonstrate the importance of my research study by elaborating the significance of my findings in the conclusion" (M = 4.56, SD = 0.50). These results suggest that students are conscious of making their recommendations understandable and are also able to highlight the value of their research.

On the other hand, the bottom three statements, although still rated proficient, showed slightly lower mean scores. These were: "I can make a good conclusion by reviewing the key points of my research and explain to the reader why the information is relevant, applicable, or related to the world as a whole" (M = 4.32, SD = 0.66), "I know how to wrap up my thesis to make a proper conclusion and recommendation" (M = 4.28, SD = 0.70), and "I know how to answer my research question and synthesize it into a final takeaway that the reader will remember" (M = 4.25, SD = 0.69). These imply that while students can summarize and reflect on their findings, some still need support in confidently wrapping up their research with clarity and impact.

The overall results suggest that students are able to draw relevant and logical conclusions from their data and provide sound recommendations. Their ability to analyze findings and link them to real-world applications is evident, but further improvement is still needed to elevate their proficiency to a higher level. Strengthening this skill will not only help students avoid common mistakes like overgeneralizing results, but also improve their communication skills, especially in presenting their research to varied audiences. Being able to draw strong conclusions and suggest practical recommendations is essential not just for academic success but also for informed decision-making in professional settings.

This finding supports the work of Urban (2019), who emphasized that drawing conclusions is a critical thinking skill that individuals use daily based on what they observe, hear, or read. In academic settings, it reflects one's ability to synthesize key findings meaningfully. Furthermore, as Alex (2023) pointed out, the recommendations section plays a vital role in a research paper or thesis. While implications describe the broader impact of the findings, recommendations offer practical steps that can be taken based on those results. Being proficient in both strengthens the overall quality and utility of a student's research.

Table 5 Level of Students' Research Proficiency in Terms of Making Conclusions and Recommendations

Statement	M	SD	VI
1. I ensure that my recommendations are written in clear and concise language, avoiding jargon or technical terms difficult to understand.	4.64	0.48	Very Proficient
2. I demonstrate the importance of my research study by elaborating the significance of my findings on the conclusion.	4.56	0.50	Very Proficient
3. I can concisely state the main findings of my research and make recommendations for future research.	4.42	0.63	Proficient
4. I ensure that my recommendation logically aligns with my conclusions and I refrain from suggesting irrelevant solutions.	4.42	0.63	Proficient

5. I make sure to dedicate enough time in writing my conclusion and do not put it off until the very last minute.	4.39	0.74	Proficient
6. I have summarized my overall argument or key takeaways on making conclusion.	4.39	0.55	Proficient
7. I make recommendations for future work on other aspects of my thesis topic.	4.34	0.59	Proficient
8. I can make a good conclusion by reviewing the key points of my research and explain it to the reader why the information is relevant, applicable, or related to the world as a whole.	4.32	0.66	Proficient
9. I know how to wrap up my thesis to make a proper conclusion and recommendation.	4.28	0.70	Proficient
10. I know how to answer my research question and synthesize them into a final takeaway that the reader will remember.	4.25	0.69	Proficient
Overall	4.40	0.38	Proficient

Note. Interpretation is based on the following scale: 4.50-5.00 (Very Proficient), 3.50-4.49 (Proficient), 2.50 - 3.49 (Moderately Proficient), 1.50 - 2.49 (Less Proficient), and 1.00 – 1.49 (Not Proficient).

Level of students' Research Proficiency in Terms of Referencing

Table 6 presents the research proficiency of BSEd Science students in the area of referencing. Overall, the results revealed that students were proficient in referencing, with an average rating of M = 4.33 (SD = 0.41). This suggests that, in general, students possess a solid understanding of how to properly acknowledge the sources they use in their academic writing.

Among the indicators, three statements received the highest ratings and were marked as very proficient. These include: "I check my references for quality and accuracy" (M = 4.54, SD = 0.58), "I follow the principles of academic integrity and honesty, such as giving credit where credit is due, acknowledging the limitations or biases of my sources, and respecting the intellectual property rights of others" (M = 4.53, SD = 0.53), and "I make a list of references to save more time when putting together my bibliography" (M = 4.51, SD = 0.59). These findings suggest that many students are not only familiar with referencing but also understand its value in maintaining credibility and academic honesty.

Meanwhile, the lowest-rated but still proficient statements include: "I am familiar with the APA style of referencing" (M = 4.06, SD = 0.92), "I check for any updates or changes in the referencing format that I use" (M = 4.03, SD = 0.97), and "I make sure to arrange my references in alphabetical order" (M = 4.03, SD = 0.92). These scores indicate that while students are generally competent in referencing, some aspects especially technical details such as formatting styles and recent updates may still need reinforcement.

These results show that students have a good understanding of why it's important to cite sources and how to do it effectively. They recognize the importance of acknowledging the authors of the works they reference and are careful to avoid plagiarism. Referencing properly not only gives credit to original researchers but also adds clarity and reliability to students' work, allowing readers to trace the sources and confirm the credibility of the information presented.

This supports the findings of Williamson (2021), who emphasized that referencing is more than just a requirement, it is a crucial part of academic writing that upholds intellectual honesty and prevents plagiarism. Referencing systems, like APA, provide a structured way to give credit and help students maintain academic integrity in all forms of scholarly work.

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Table 6 Level of Students' Research Proficiency in Terms of Referencing

Statement	M	SD	VI
1. I check my references for quality and accuracy.	4.54	0.58	Very Proficient
2. I follow the principles of academic integrity and honesty, such as giving credit where credit is due, acknowledging the limitations or biases of my sources, and respecting the intellectual property rights of others.	4.53	0.53	Very Proficient
3. I make a list of references to save more time when putting together my bibliography.	4.51	0.59	Very Proficient
4. I make sure each reference follows their own appropriate format.	4.48	0.53	Proficient
5. I make sure that my references are relevant, reliable, and recent, and that they support my arguments and claims.	4.42	0.66	Proficient
6. I write down the complete citation information for each book, journals/abstract, and websites.	4.40	0.68	Proficient
7. I use referencing tools or reference management software such as artificial intelligence in referencing.	4.28	0.78	Proficient
8. I am familiar with the APA style of referencing.	4.06	0.92	Proficient
9. I check for any updates or changes in the referencing format that I use.	4.03	0.97	Proficient
10. I make sure to arrange my references in an alphabetical order.	4.03	0.92	Proficient
Overall	4.33	0.41	Proficient

Note. Interpretation is based on the following scale: 4.50-5.00 (Very Proficient), 3.50-4.49 (Proficient), 2.50 - 3.49 (Moderately Proficient), 1.50 - 2.49 (Less Proficient), and 1.00 – 1.49 (Not Proficient).

Level of Challenges experienced by BSEd Science Students

Table 7 presents the challenges experienced by BSEd Science students during the actual conduct of their research. Overall, results showed that students generally found the research process to be "challenging" (M = 3.50, SD = 0.99). Specifically, data gathering (M = 3.70, SD = 1.09), formulating the research problem (M = 3.65, SD = 1.07), and analyzing, interpreting, and presenting data (M = 3.55, SD = 1.08) were all rated as challenging areas. Meanwhile, making conclusions and recommendations (M = 3.40, SD = 1.07) and referencing (M = 3.20, SD = 1.14) were found to be "moderately challenging." These findings suggest that while students generally struggle with more technical aspects of research such as formulating problems and handling data, they are somewhat more comfortable when it comes to concluding and referencing their work.

These results indicate that students face multiple obstacles throughout their research journey. The challenges they encounter may be due to a variety of reasons, such as limited research experience, lack of access to necessary resources, time pressures, and the complexity of the research process itself. However, the level of difficulty varies from one student to another, and the impact on their research performance differs as well. Despite these struggles, the experience of conducting research remains valuable. It provides students with opportunities to build resilience, develop perseverance, and improve their problem-solving skills. Moreover, with proper mentorship, support systems, and access to learning tools, students can navigate these challenges more effectively and enrich their overall research experience.

This study supports the observations of Alaee and Zwickl (2022), who found that undergraduate students often face multiple challenges during the research process, particularly in areas such as data collection, formulating

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research questions, and interpreting findings. These difficulties are often linked to limited research experience, time constraints, and access to resources. Similarly, Chavez et al. (2025) emphasized that effective mentorship and supportive academic environments play a crucial role in helping students overcome such obstacles. Both studies align with the findings of this research, highlighting that while students find certain research tasks challenging, these experiences also promote valuable skills such as resilience, perseverance, and critical thinking. With proper support and guidance, students can navigate the research process more effectively and grow both academically and personally. Similarly, Ibrahim (2015) found that students encounter difficulties in thesis writing, especially in grammar, sentence construction, and vocabulary use. Together, these studies highlight the common barriers in student research and the need for institutional and instructional support to help learners overcome them.

Table 7 Challenges Experienced by BSEd Science Students During the Conduct of Research

Research Process	M	SD	VI
Data Gathering	3.70	1.09	Challenging
Formulating the Research Problem	3.65	1.07	Challenging
Analysis, Interpretation and Presentation of Data	3.55	1.08	Challenging
Making Conclusions and Recommendations	3.40	1.07	Moderately Challenging
Referencing	3.20	1.14	Moderately Challenging
Overall	3.50	0.99	Challenging

Note. Interpretation is based on the following scale: 4.50-5.00 (Highly Challenging), 3.50-4.49 (Challenging), 2.50 - 3.49 (Moderately Challenging), 1.50 - 2.49 (Less Challenging), and 1.00 – 1.49 (Not Challenging).

Level of Students' Challenges in Terms of Formulating the Research Problem

Table 8 shows the challenges experienced by BSEd Science students in formulating their research problem. Overall, the results indicated that students found this task to be "challenging" (M = 3.65, SD = 1.07). The most challenging aspects identified were: developing a specific research problem from broad topic areas (M = 3.85, SD = 1.20), narrowing their focus to a single topic (M = 3.85, SD = 1.16), and mapping out different issues to identify a valuable research problem (M = 3.79, SD = 1.26). On the other hand, students found it "moderately challenging" to formulate relevant research problems (M = 3.40, SD = 1.29) and to seek answers for all their research questions (M = 3.35, SD = 1.27).

These findings suggest that students often face difficulties during the early stages of research, particularly when it comes to clearly identifying what they want to study. Formulating a strong research problem is a key step in the process, but one that requires critical thinking, creativity, and an understanding of the subject area. A common challenge lies in pinpointing gaps in the existing literature or finding researchable topics that are both original and meaningful. Students may feel overwhelmed by broad subject areas and struggle to refine them into focused questions.

Despite these challenges, support systems such as mentoring, exposure to related studies, and guided literature reviews can help students overcome these barriers. With proper guidance and resources, they can learn to identify feasible and relevant topics that contribute to their field.

These results align with the findings of Aragon et al. (2015), who found that formulating a research problem was among the most difficult tasks for students. Their study noted that students struggled to justify their chosen research problems and to build arguments based on the literature they reviewed. This highlights the importance of helping students develop the ability to reason systematically and critically when defining their research direction. Strengthening this skill can lead to more effective and well-grounded research proposals.

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Table 8 Level of Students' Challenges in Terms of Formulating the Research Problem

Statement	M	SD	VI
1. I find it challenging developing specific research problem out of wider topic areas.	3.85	1.20	Challenging
2. I find it hard to narrow my focus to a single topic in order to formulate a research problem.	3.85	1.16	Challenging
3. I always struggle in mapping different issues to find a valuable research problem.	3.79	1.26	Challenging
4. I find it hard to collect and choose appropriate related studies to support my study.	3.75	1.24	Challenging
5. I am having difficulty in developing or formulating a research problem due to uncertainty.	3.70	1.19	Challenging
6. I am having difficulty in determining the scale of my research problem.	3.65	1.27	Challenging
7. I find it complicated and it takes too long to formulate a research problem.	3.62	1.32	Challenging
8. I always get stuck in designing research questions to find solutions for my research problem.	3.54	1.28	Challenging
9. I find it hard to formulate relevant research problems.	3.40	1.29	Moderately Challenging
10. I find it difficult to seek answers for all of my research questions.	3.35	1.27	Moderately Challenging
Overall	3.65	1.07	Challenging

Note. Interpretation is based on the following scale: 4.50-5.00 (Highly Challenging), 3.50-4.49 (Challenging), 2.50 - 3.49 (Moderately Challenging), 1.50 - 2.49 (Less Challenging), and 1.00 – 1.49 (Not Challenging).

Level of Students' Challenges in Terms of Data Gathering

Table 9 highlights the challenges experienced by BSEd Science students in gathering data for their research. Overall, the results show that students found this part of the research process to be "challenging" (M = 3.70, SD = 1.09). The most notable difficulties included facing financial constraints that sometimes prevent timely data collection (M = 3.93, SD = 1.31), feeling nervous during interviews in qualitative research (M = 3.92, SD = 1.23), and experiencing confusion about where or how to gather reliable information due to the presence of fake news (M = 3.76, SD = 1.31).

Meanwhile, the statements with the lowest but still challenging were: difficulty in encouraging respondent cooperation (M = 3.54, SD = 1.41), struggles in determining an adequate or representative sample (M = 3.54, SD = 1.29), and difficulty in choosing a suitable research instrument for data collection (M = 3.54, SD = 1.27). Despite differences in rating, all aspects related to data gathering were consistently marked as challenging.

These results suggest that many students face barriers when trying to collect accurate and timely data. Common issues include logistical problems like funding, access restrictions, and participant availability. In addition, ensuring the credibility and relevance of collected data can be difficult, especially when students encounter misleading or unreliable sources.

This aligns with the findings of Barrett and Twycross (2018), who emphasized that while data collection methods are essential in research, students often encounter difficulties due to various limitations. However, over time, students develop better strategies and gain confidence in designing appropriate tools and gathering data more effectively.

Table 9 Level of students' Challenges in Terms of Data Gathering

Statement	M	SD	VI
1. There are times that financial constraint which prevents me from gathering data on time.	3.93	1.31	Challenging
2. In doing qualitative research, there are times that I feel nervous as I conduct interview.	3.92	1.23	Challenging
3. In the existence of fake news, I am sometimes getting confused on what or where to gather necessary data for my study.	3.76	1.31	Challenging
4. Sometimes, I felt I lacked the competence in gathering data through interviews.	3.76	1.23	Challenging
5. I always struggle in planning suitable methods to gather data.	3.73	1.28	Challenging
6. I am having difficulty in determining the accurate and reliable data that can support my study.	3.68	1.33	Challenging
7. I feel certain dilemma in selecting an appropriate research method for my selected research issue.	3.64	1.20	Challenging
8. I find it hard to think of a specific strategy that would make my respondents cooperate with me.	3.54	1.41	Challenging
9. I am having difficulty in determining the sample in terms of considering an adequate or representative sample.	3.54	1.29	Challenging
10. I find it hard to find an appropriate instrument to collect research data that would suit to my respondents.	3.54	1.27	Challenging
Overall	3.70	1.09	Challenging

Note. Interpretation is based on the following scale: 4.50-5.00 (Highly Challenging), 3.50-4.49 (Challenging), 2.50 - 3.49 (Moderately Challenging), 1.50 - 2.49 (Less Challenging), and 1.00 – 1.49 (Not Challenging).

Level of Students' Challenges in Terms of Analysis, Interpretation, and Presentation of Data

Table 10 outlines the challenges faced by BSEd Science students in analyzing, interpreting, and presenting research data. Overall, students found this part of the research process as "challenging" (M = 3.55, SD = 1.08). Among the highest-rated difficulties were interpreting and analyzing large amounts of data in qualitative research (M = 3.85, SD = 1.12), constructing instruments appropriate to their study (M = 3.84, SD = 1.11), and drawing generalizations from their interpreted data (M = 3.43, SD = 1.33).

Meanwhile, the lowest-rated but still significant challenges were transcribing participants' responses (M = 3.31, SD = 1.50) and tallying responses (M = 3.17, SD = 1.38), both considered "moderately challenging.".

These findings indicate that students commonly encounter difficulties in making sense of their collected data and turning it into meaningful conclusions. The challenges may arise from a lack of familiarity with analysis techniques, uncertainty about how to draw logical interpretations, or difficulties in summarizing and organizing results in a clear and accurate manner.

This suggests the need for students to strengthen their analytical skills and seek support when needed. Guidance from mentors, collaboration with group members, and the development of both technical and critical thinking skills can significantly ease the process of data interpretation and presentation.

The results are in line with Anderson's (2015) findings, which emphasized that students perceive research writing as difficult across all stages from defining the research problem to analyzing and presenting data. This study affirms that data analysis and interpretation remain particularly challenging for many students.

Table 10 Level of Students' Challenges in Terms of Analysis, Interpretation and Presentation of Data

Statement	M	SD	VI
1. In doing qualitative research, I find it challenging or difficult to interpret and analyze large amount of data.	3.85	1.12	Challenging
2. There are times, that I experienced difficulty to construct the instrument appropriate to my study.	3.84	1.11	Challenging
3. I am having a hard time organizing the ideas and evidences that should be presented.	3.79	1.21	Challenging
4. I struggle in using appropriate data analysis, interpretation, and presentation techniques, to derive meaningful insights, and research findings effectively.	3.59	1.20	Challenging
5. As I do quantitative research, it is hard for me to convert the data gathered into numerical form to reduce the huge quantity of data.	3.56	1.35	Challenging
6. I am having a hard time figuring out what statistical tool should I use in interpreting the data.	3.51	1.29	Challenging
7. It is difficult for me to connect my analyzed and interpreted data to my literature review and the previous studies.	3.45	1.34	Challenging
8. I am having a hard time drawing generalization out of my analyzed and interpreted data.	3.43	1.33	Challenging
9. In doing qualitative research I find it difficult transcribing the response of the participants of my study.	3.31	1.50	Moderately Challenging
10. I am having difficulty in tallying all the response of my respondents.	3.17	1.38	Moderately Challenging
Overall	3.55	1.08	Challenging

Note. Interpretation is based on the following scale: 4.50-5.00 (Highly Challenging), 3.50-4.49 (Challenging), 2.50 - 3.49 (Moderately Challenging), 1.50 - 2.49 (Less Challenging), and 1.00 – 1.49 (Not Challenging).

Level of Students' Challenges in Terms of Making Conclusions and Recommendations

Table 11 shows the challenges BSEd Science students face when writing conclusions and recommendations. Overall, students rated this part of the research process as moderately challenging (M = 3.40, SD = 1.07).

The top three difficulties included writing clear and jargon-free recommendations (M = 3.56, SD = 1.16), summarizing or synthesizing the results (M = 3.54, SD = 1.30), and making sure that their conclusions and recommendations logically align (M = 3.41, SD = 1.15). These were all rated as challenging.

Meanwhile, the challenges that students found easier but still worth mentioning were avoiding personal bias when making conclusions (M = 3.34, SD = 1.35), procrastinating or rushing the conclusion writing (M = 3.32, SD = 1.23), and explaining the relevance of their findings to future researchers (M = 3.29, SD = 1.38). These were rated moderately challenging.

The results suggest that many students struggle to clearly interpret their research findings and express their ideas when writing the final parts of their paper. They often find it hard to link their conclusions and recommendations back to their original research questions or results.

This implies that drawing solid conclusions and giving relevant recommendations takes more than just summarizing findings it requires critical thinking and careful reflection. Some students may lack confidence in analyzing complex data or worry about making the wrong interpretations. But with proper guidance and more practice, students can improve in this area and build stronger, more meaningful final sections in their research.

These findings support Shuttleworth and Wilson (2024), who emphasized how a weak conclusion can undermine even the best research. Similarly, Urban (2023) pointed out that the ability to draw accurate conclusions is not just important in academics, but also in everyday life. Writing thoughtful recommendations is a key part of any research paper, especially in the final discussion and conclusion sections.

Table 11 Level of Students' Challenges in Terms of Making Conclusions and Recommendations

Statement	M	SD	VI
1. It is hard for me to ensure that my recommendations are written in a clear and concise language, or avoid any jargon or technical terms that are difficult to understand.	3.56	1.16	Challenging
2. I am having a hard time synthesizing the results of my study.	3.54	1.30	Challenging
3. I find it difficult to ensure the logical alignment of the recommendation and conclusion part of my research study.	3.41	1.15	Challenging
4. I find it hard to elaborate and concise my ideas as I draw conclusion.	3.39	1.26	Moderately Challenging
5. I am having difficulties providing specific and concrete suggestions for future researchers.	3.37	1.31	Moderately Challenging
6. I find it challenging to reiterate and summarize the main points of my research study.	3.37	1.27	Moderately Challenging
7. I don't know where to start as I summarize the results of my study.	3.34	1.43	Moderately Challenging
8. I can't avoid biases as I draw/make conclusion for my research study.	3.34	1.35	Moderately Challenging
9. I don't feel like I dedicate enough of my time in writing my conclusion and most of the time I put it off unto the very last minute.	3.32	1.23	Moderately Challenging
10. I am having difficulties explaining the implications of my research findings to future researchers for recommendation.	3.29	1.38	Moderately Challenging
Overall	3.40	1.07	Moderately Challenging

Note. Interpretation is based on the following scale: 4.50-5.00 (Highly Challenging), 3.50-4.49 (Challenging), 2.50 - 3.49 (Moderately Challenging), 1.50 - 2.49 (Less Challenging), and 1.00 – 1.49 (Not Challenging).

Level of Students' Challenges in Terms of Referencing

Table 12 shows the challenges BSEd Science students face when it comes to referencing in their research. Overall, the results indicate that referencing is "moderately challenging" for most students (M = 3.20, SD = 1.14). Among the specific issues, the most common struggle was finding the right secondary sources for their studies (M = 3.59, SD = 1.30). Students also shared difficulties in using reference management tools or software (M = 3.32, SD = 1.41), keeping track of complete citation details (M = 3.32, SD = 1.34), and writing the references themselves (M = 3.07, SD = 1.41). Some admitted to not knowing how to use AI tools for referencing (M = 2.98, SD = 1.33), and others said they had never heard of APA style (M = 2.84, SD = 1.50). All these were still considered "moderately challenging."

These results highlight that many students struggle with properly citing their sources, often unsure which referencing style to use or how to organize their materials correctly. This reflects a gap in familiarity with citation tools, style guides, and even basic referencing practices. These difficulties may stem from limited exposure or training in research writing and academic integrity.

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These findings further reveal that many students struggle with accurate citation, citation style selection, and source organization. Such difficulties often stem from limited exposure and insufficient training in referencing practices. This is similar to the study of Rezeki (2018) which highlighted that undergraduate students frequently make citation errors and rely on inconsistent referencing styles, while Dawe (2024) underscored the ongoing challenges students face in mastering citation mechanics, pointing to the need for stronger institutional support and user-friendly referencing tools..

Table 12 Level of Students' Challenges in Terms of Referencing

Statement	M	SD	VI
1. I am having a hard time finding the right secondary sources that I need in my research study.	3.59	1.30	Moderately Challenging
2. I am having difficulties in using referencing tools or reference management software in doing referencing for my research study.	3.32	1.41	Moderately Challenging
3. I most of the time lost track of the complete citation information for each book, journal/abstract, and websites that I use for my study.	3.32	1.34	Moderately Challenging
4. I find it hard to make sure that each reference follows their own appropriate format.	3.28	1.25	Moderately Challenging
5. I am having a hard time setting a timeframe as I work for the references part of my study.	3.28	1.22	Moderately Challenging
6. It is hard for me to follow the correct referencing style specifically for books, journals/abstract and websites that I use for my study.	3.20	1.38	Moderately Challenging
7. I am having difficulty keeping track on the updates or corrections in my sources.	3.12	1.37	Moderately Challenging
8. I am having a hard time writing my references.	3.07	1.41	Moderately Challenging
9. I don't know how to use the AI referencing tool.	2.98	1.33	Moderately Challenging
10. I am not aware or never heard of the APA style of referencing.	2.84	1.50	Moderately Challenging
Overall	3.20	1.14	Moderately Challenging

Note. Interpretation is based on the following scale: 4.50-5.00 (Highly Challenging), 3.50-4.49 (Challenging), 2.50 - 3.49 (Moderately Challenging), 1.50 - 2.49 (Less Challenging), and 1.00 – 1.49 (Not Challenging).

Level of Research Engagement of BSEd Science Students

Table 13 shows that BSEd Science students are fairly engaged in research, with an overall rating of (M = 4.10, SD = 0.54). The standout statement rated as highly engaged was: "I fully devote myself to make sure that I can finish my research study on time" (M = 4.50, SD = 0.50). Other activities such as participating in research conferences (M = 3.82, SD = 1.14), presenting research (M = 3.76, SD = 1.19), and attending educational webinars (M = 3.53, SD = 1.11) were rated as simply "engaged."

These findings suggest that while students are highly committed to completing their research on time, they are somewhat less involved in wider research communities or development opportunities. That partial engagement still matters it boosts their learning, builds confidence, and lays the groundwork for future academic growth.

This supports the study of Rezeki (2018) found that students with higher research capability and emotional confidence tended to exhibit stronger academic engagement highlighting how hands-on involvement can elevate motivation and comprehension. Further, cooperative learning environments have been shown to boost both engagement and academic outcomes significantly (as evidenced by moderate to strong effect sizes in studies by Khalid & El-Sayed, 2023).

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Table 13 Students' Level of Research Engagement

Statement	M	SD	VI
1. I fully devote myself to make sure that I can finish my research study on time.	4.50	0.50	Highly Engaged
2. I make sure to dedicate enough time in writing every parts of my research study.	4.48	0.59	Engaged
3. I make sure that the information I get to support my study is fresh, new or relevant.	4.43	0.58	Engaged
4. I set a timeframe in getting all the information I needed for my study.	4.23	0.70	Engaged
5. I consult different individuals such as my fellow researchers, peers or even teachers with regards to the improvement of my research study.	4.20	0.91	Engaged
6. I partake on different class session about research for better understanding.	4.14	0.88	Engaged
7. I make sure to collaborate the various ideas of my research along with other students who are engaged in research for better understanding.	3.96	0.97	Engaged
8. I was able to participate in a research conference outside our school.	3.82	1.14	Engaged
9. I joined in research presentation to disseminate the result/s of my study.	3.76	1.19	Engaged
10. I attend educational webinars on research to expand my knowledge in conducting research.	3.53	1.11	Engaged
Overall	4.10	0.54	Engaged

Note. Interpretation is based on the following scale: 4.50-5.00 (Highly Engaged), 3.50-4.49 (Engaged), 2.50 - 3.49 (Moderately Engaged), 1.50 - 2.49 (Moderately Disengaged), and 1.00 – 1.49 (Highly Disengaged).

Relationship Between Students Research Proficiency and Student Engagement

Results showed that there is a positive, moderately weak, significant relationship between research proficiency and engagement of BSEd Science students, (r_s = 0.469, p = <.001), in general as shown in the table 14. This means that students who demonstrate stronger research skills also tend to be more engaged in the research process.

This implies that the more proficient students are, the more likely they are to invest time, effort, and interest in their research work. These students often display higher motivation, stronger commitment, and a clear drive to complete their research projects. This connection suggests that skill and enthusiasm often go hand in hand in academic work.

Engaged students are typically more curious, self-directed, and open to collaboration. They also tend to be more confident in evaluating sources, making critical decisions, and thinking deeply about their research topics. As students grow in their research proficiency, they often develop sharper critical thinking skills—an essential asset for conducting meaningful and credible research.

This supports insights from Smith and Khan (2021), who found that student research self-efficacy positively correlates with academic engagement, with confident learners showing higher persistence, adaptability, and active participation in scholarly activities—even when controlling for gender and prior achievement.

Relationship Between Students Engagement and Research Challenges

The results also revealed a weak but significant positive relationship between student engagement and the challenges they face in research (rs = 0.244, p = .049). This means that while challenges exist, engaged students are often more capable of handling them.

Students who are involved and enthusiastic about their research are more likely to push through difficult moments. Their motivation helps them stay focused, seek solutions, and even learn from their setbacks. Engagement becomes a tool for perseverance it helps students turn obstacles into opportunities for growth.

Engaged students tend to demonstrate resilience, creativity, and a willingness to seek support when needed. They also tend to adopt a growth mindset, viewing challenges as learning experiences rather than roadblocks. These qualities help them cope with complex tasks such as data gathering, analysis, writing, and revising their work.

This observation is in line with Appleton (2019), who described student engagement as a dynamic and multidimensional process. It reflects a student's emotional, behavioral, and cognitive investment in learning and is shaped by both internal and external factors. Appleton also pointed out that engaged students are better equipped to handle academic challenges due to their deeper connection to their work. Basically, engagement doesn't eliminate challenges it helps students manage and learn from them.

Relationship Between Students Research Proficiency and Research Challenges

The data revealed no significant relationship between students' research proficiency and the challenges they faced ($rs = -0.178$, $p = .159$). This suggests that even students who are highly skilled in research are not immune to encountering difficulties during the research process.

Research challenges come in many forms limited resources, unclear methodologies, time constraints, and even personal factors. These issues may not be directly tied to how good a student is at research, but rather to the complexity and unpredictability of the research environment itself.

This finding highlights an important reality: being proficient doesn't automatically mean a student will face fewer obstacles. Many challenges require more than technical know-how they call for problem-solving, adaptability, creativity, and sometimes just support from peers or mentors.

Overcoming these hurdles requires more than expertise. It also demands resilience, flexibility, problem-solving, collaboration, and access to support and resources. In short, effective navigation of research challenges depends on multiple factors both personal and situational not just on how "proficient" a student is.

This aligns with the findings of Andalón, Cheng, and Barnes (2023), who reported that students' research confidence alone did not reduce the impact of environmental and logistical challenges. Their study emphasized that overcoming such obstacles often requires institutional support, mentorship, and access to proper tools and funding.

Table 14 Relationships Among Variables: Research Proficiency, Challenges, and Engagement

Variable	Test Statistics	r_s	p-value
Students Research Proficiency & Engagement	Spearman's Rho	0.469**	<.001
Students Engagement in Research & Challenges	Spearman's Rho	0.244*	.049
Students Research Proficiency & Challenges	Spearman's Rho	-0.178	.159

***** $p < .05$, ** $p < .01$

CONCLUSIONS

BSEd Science students generally demonstrate a proficient level of research skills. This suggests that they possess a strong foundation in research knowledge and processes. However, there are still areas that require improvement to help them become highly proficient, especially in applying their skills during the actual conduct of research. Despite the challenges that come with doing research, students reported only moderate levels of difficulty. This may be because many of them have repeatedly encountered similar obstacles in past academic work, allowing them to build familiarity and develop strategies to cope and remain focused on completing their tasks.

Furthermore, students strong engagement in research reflects their motivation, passion, and eagerness to learn. This level of engagement makes the research process more meaningful and enjoyable for them, contributing to both academic growth and personal development. The study also found a moderate but significant positive relationship between student engagement and research proficiency. In other words, those who are more engaged in the research process tend to demonstrate stronger research skills likely because they are more invested in their learning and willing to exert effort and time to improve.

Interestingly, research proficiency did not significantly reduce the challenges students faced. This highlights an important point: being skilled in research does not necessarily shield students from obstacles. Research-related challenges can arise from a range of factors such as limited resources, unclear methods, time constraints, or personal circumstances. Overcoming these difficulties often requires more than technical skills; it also involves persistence, adaptability, emotional support, and access to helpful networks such as peers or mentors.

Overall, the study emphasizes the critical role of student engagement not just in enhancing research proficiency, but also in how students respond to the certain challenges of the research process. Engaged students are more likely to remain resilient, creative, and resourceful, showing a growth mindset that enables them to learn from mistakes and continue progressing. While proficiency and engagement are interconnected, facing and overcoming research challenges involves a complex interplay of skills, mindset, and support systems. Encouraging both strong research training and deeper student involvement is therefore key to developing empowered and capable future educators and researchers.

RECOMMENDATIONS

Schools may provide suitable facilities that promote focused and distraction-free research work because a conducive learning environment can greatly influence how students approach and complete their research tasks. Alongside this, teachers are encouraged to promote an inclusive classroom atmosphere where every student feels confident to participate, ask questions, and develop their skills through encouragement and constructive feedback.

Improving student engagement is a shared responsibility among teachers, parents, and the school community. Teachers can sustain this by acknowledging students' efforts, offering patient guidance, and creating activities that spark curiosity and critical thinking, such as investigatory projects and research presentations. Incorporating energizing and enjoyable activities in lessons can also make students more comfortable and eager to learn. Parents, for their part, can support their children by showing genuine interest in their academic progress and providing a home environment that encourages learning. This kind of involvement helps shape positive attitudes and habits that contribute to both academic success and personal growth.

To strengthen students' referencing skills, schools may conduct more practical workshops focused on citation formats like APA, including how to apply the latest updates and arrange sources correctly. In addition, integrating project-based learning and real-world case studies into the curriculum can help students connect theory with practice. These activities will give them the opportunity to plan and manage practical aspects of research, such as budgeting and scheduling, in a supportive setting.

School administrators are encouraged to introduce programs that address specific gaps in research proficiency and engagement. These should include continuous training and professional development for teachers so they can improve their teaching approaches and cater to diverse learning needs.

Finally, it is recommended that future researchers explore other variables or conduct more in-depth studies. Such efforts could offer a deeper understanding of the factors that influence students' research experiences and contribute to enhancing science education overall.

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