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Leveling Up with IT Capstone Research Writing: Burden or Breakthrough?

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A B S T R A C T

This study investigated students' experiences in writing IT Capstone Research Projects in terms of perceived usefulness, attitudes toward research writing, and perceptions of effectiveness. A mixed-methods research design was utilized involving 98 IT students who had completed or were undertaking their capstone projects in 2025. Data were collected using a validated survey questionnaire and analyzed through descriptive statistics and analysis of variance using Jamovi statistical software. Findings revealed that students generally perceived the capstone project as useful and effective in developing research, technical, and professional skills while maintaining positive attitudes toward research writing. The Project Planning and Proposal stage was identified as the most helpful component, while Time Management emerged as the primary challenge encountered by students.

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INTRODUCTION

The IT Capstone Research Project is a culminating academic requirement that integrates students' technical knowledge, research competencies, and problem-solving skills acquired throughout their Information Technology program. It serves as a platform for students to apply theoretical concepts into practical solutions, develop research and documentation skills, and demonstrate their readiness for professional practice (Sanchez, Malinao, & Bautista, 2017). Moreover, undergraduate research experiences have been recognized for enhancing career-ready and transferable skills, making capstone projects an essential component of higher education (Gunnels et al., 2024).

Despite its significance, the process of writing a capstone research project is often perceived as demanding and complex. It requires substantial time, effort, and intellectual engagement, which may influence students' motivation and performance (Appiagyei, Fenyi, & Awogya, 2022; Villarino, 2022). The effectiveness of the capstone experience is therefore closely tied to how students perceive its usefulness, how they respond to the demands of research writing, and how they evaluate its overall contribution to their learning.

Previous studies emphasize that students' perceived usefulness, attitudes, and perceptions of effectiveness play a critical role in shaping their engagement and learning outcomes. Positive perceptions can enhance motivation and skill development, while negative experiences may hinder performance and reduce the value of the learning process (Finlay, Tinnion, & Simpson, 2022; Raymunde Jr. et al., 2024). In this context, understanding how students experience capstone research writing becomes essential in improving both instructional design and program implementation.

However, students frequently encounter various challenges during the capstone process. These include difficulties in time management, technical development, research and data gathering, and access to relevant resources (Janer, Deri, & Carretero, 2022; Perez et al., 2022). In addition, the evolving educational landscape, including the integration of digital tools and emerging technologies, introduces both opportunities and complexities in research writing (Michel-Villarreal et al., 2023). Such challenges highlight the need for stronger institutional support and more structured guidance throughout the capstone process.

While existing literature has explored the benefits and challenges of research writing, there remains a gap in identifying which specific components of the IT Capstone Project are most beneficial to students and how these relate to the challenges they encounter. Furthermore, there is limited empirical evidence that examines whether students' experiences significantly differ based on these factors. Addressing this gap is essential in developing targeted strategies that enhance the effectiveness of capstone programs.

In response, this study aims to assess students' experiences in IT Capstone Research Project writing in terms of perceived usefulness, attitudes toward research writing, and perceptions of effectiveness. It also seeks to identify the most helpful parts of the capstone process, the primary challenges faced by students, and areas that require improvement. By providing data-driven

insights, the study contributes to the enhancement of capstone research programs, promotes student engagement, and supports the development of research competencies necessary for career readiness in the field of Information Technology.

LITERATURE REVIEW

This section presents related literature that supports the study by examining students' experiences in IT Capstone Research Project writing. The review is organized into two major themes: (1) Capstone Research as a Tool for Skill Development and Career Readiness, and (2) Challenges and Support Mechanisms in Capstone Research Writing. These themes provide a deeper understanding of how students perceive the capstone experience and the factors that influence their learning outcomes.

Capstone Research as a Tool for Skill Development and Career Readiness

Capstone research projects are widely recognized as essential in developing students' academic, technical, and professional competencies. According to Sanchez, Malinao, and Bautista (2017), research writing serves as a foundation for students to enhance their skills in inquiry, documentation, and application of knowledge. Similarly, Gunnels et al. (2024) emphasized that undergraduate research experiences significantly contribute to the development of transferable and career-ready skills, such as critical thinking, communication, and problem-solving. These competencies are crucial in preparing students for real-world IT environments.

Furthermore, students' perceptions of usefulness and effectiveness play a vital role in shaping their engagement in capstone research. Finlay, Tinnion, and Simpson (2022) highlighted that positive learning experiences increase student motivation and participation, while Raymunde Jr. et al. (2024) noted that engagement in research activities enhances both academic performance and professional readiness. When students perceive capstone projects as meaningful and relevant, they are more likely to develop a positive attitude toward research writing and recognize its long-term value in their careers.

Challenges and Support Mechanisms in Capstone Research Writing

Despite its benefits, capstone research writing presents several challenges that may hinder student success. Studies have shown that students commonly struggle with time management, technical complexities, research design, and access to relevant resources (Appiagyei, Fenyi, & Awogya, 2022; Villarino, 2022). In the Philippine context, Janer, Deri, and Carretero (2022) and Perez et al. (2022) identified limitations in research capability and institutional support as contributing factors to these difficulties. These challenges can negatively affect students' attitudes and perceptions of the capstone experience if not properly addressed.

To address these concerns, literature emphasizes the importance of structured support systems, including mentorship, collaborative learning, and access to adequate resources. Lunag Jr. et al. (2024) highlighted the need for

sustainable research support in higher education institutions, while Michel-Villarreal et al. (2023) discussed how emerging technologies, including AI tools, can assist students in overcoming research-related challenges. Additionally, guided instruction and peer collaboration have been shown to improve students' confidence and research performance (Finlay, Tinnion, & Simpson, 2022). These support mechanisms play a critical role in enhancing the overall effectiveness of the capstone research process and improving student outcomes.

METHODOLOGY

This study employed a mixed-methods research design to provide a comprehensive analysis of students' experiences in writing IT Capstone Research Projects. The quantitative component focused on measuring students' perceptions in terms of Perceived Usefulness, Attitudes Toward Capstone Research Writing, and Perception of Effectiveness using a structured Likert-scale questionnaire. The qualitative component gathered insights regarding the most helpful parts of the capstone project, major challenges encountered, and areas for improvement through selected-response items and open-ended inputs.

The respondents of the study were students who had completed or were undertaking their IT Capstone Research Projects during the academic year 2025. Using Slovin's formula, a total of 98 respondents were selected to ensure representativeness. The research instrument was validated by IT education and research experts, and reliability testing was conducted using Cronbach's alpha to ensure internal consistency.

For data analysis, descriptive statistics such as frequency, percentage, mean, and average mean were used to summarize students' responses for each variable. The 4-point Likert scale was interpreted using predefined ranges to determine descriptive interpretations (e.g., Useful, Agree). To determine whether there were significant differences in students' experiences when grouped according to challenges and highlights, Analysis of Variance (ANOVA) was employed.

RESULTS AND DISCUSSION

Table 1. Experiences in IT Capstone Project Research Writing in terms of Perceived Usefulness

INDICATOR	MEAN	DESCRIPTIVE INTERPRETATION
1. Writing an IT Capstone Project helped me improve my problem-solving skills.	1.63	Useful
2. The knowledge gained from Capstone research is applicable in real-world IT projects.	1.53	Useful
3. IT Capstone research improved my technical writing and documentation skills.	1.67	Useful

4. The Capstone Project helped me understand research methodologies in IT.	1.61	Useful
5. Completing the Capstone Project prepared me for my future career in IT.	1.69	Useful
AVERAGE MEAN	**1.63**	**Useful**

The results presented in Table 1 revealed that the students generally viewed the value of the IT Capstone Project as beneficial to their academic and professional skill sets. With a range of mean values between 1.53 and 1.69, and a general average of 1.63, the students agreed that the Capstone Project helped to improve their problem-solving capabilities, technical writing and documentation skills, and their understanding of various research methodologies. Moreover, the students acknowledged the practical application of the knowledge they acquired and how it helped to prepare them for their future careers in the field of Information Technology. Therefore, the results revealed the significant role of the Capstone Project in enhancing the students' skill sets, both technically and research-wise.

Table 2. Experiences in IT Capstone Project Research Writing in terms of Attitude Toward Capstone Research Writing

INDICATOR	MEAN	DESCRIPTIVE INTERPRETATION
Writing the IT Capstone Project was challenging and time-consuming.	1.52	Agree
I enjoyed the process of conducting research and developing the IT project.	1.96	Agree
Working on the Capstone Project caused stress or anxiety.	1.60	Agree
I felt confident in my IT research and project development abilities after completing the Capstone.	1.85	Agree
I believe IT Capstone research writing is a necessary and valuable part of the curriculum.	1.59	Agree
AVERAGE MEAN	**1.70**	**Agree**

The results obtained from the data presented in Table 2 revealed that the students generally agreed with the statements regarding their attitudes towards the IT Capstone Project, with a range of mean values from 1.52 to 1.96 and an average mean value of 1.70. These results revealed that although the students found the Capstone Project to be challenging and time-consuming, they enjoyed the research process, had confidence in themselves, and understood the

importance and value of Capstone research writing in the IT curriculum. Students had a positive attitude towards the Capstone Project.

Table 3. Experiences in IT Capstone Project Research Writing in terms of Perception of Effectiveness

INDICATOR	MEAN	DESCRIPTIVE INTERPRETATION
The Capstone Project guidelines and instructions were clear and well-structured.	1.82	Agree
I received adequate support from faculty and peers during the research and development process.	1.67	Agree
The Capstone Project improved my ability to analyze, design, and implement IT solutions.	1.60	Agree
The Capstone Project experience enhanced my teamwork, time management, and project management skills.	1.58	Agree
The IT Capstone research writing experience has contributed to my readiness for professional IT work or higher studies.	1.64	Agree
AVERAGE MEAN	**1.66**	**Agree**

Table 3 shows that students generally agreed that the IT Capstone Project was effective in enhancing their learning and professional preparation, with mean scores ranging from 1.58 to 1.82 and an overall average mean of 1.66. Students perceived that the guidelines and instructions were clear, the support from faculty and peers was adequate, and that the experience improved their analytical, technical, and project management skills. Additionally, they felt that the Capstone Project contributed to their readiness for professional IT work or further studies. These findings suggest that students found the Capstone Project to be a valuable and effective component of their IT education.

Table 4. Frequency and Percentage Distribution on the IT Capstone Project Research Writing that helped them the most

INDICATOR	FREQUENCY	PERCENTAGE
Project Planning and Proposal	40	40.8 %
Literature Review and Research	7	7.1 %
System Design and Development	17	17.3 %
Testing and Implementation	24	24.5 %
Documentation and Reporting	10	10.2 %
TOTAL	**98**	**100 %**

The findings in Table 4 show that the most useful part of the IT Capstone Project, as identified by the students, was the Project Planning and Proposal stage, as it was identified by 40.8% of the students. The other parts of the IT Capstone Project, such as the Testing and Implementation stage (24.5%), the System Design and Development stage (17.3%), the Documentation and Reporting stage (10.2%), and the Literature Review and Research stage (7.1%), received recognition, albeit not as high as the first stage. This shows that the initial planning and proposal stage was the most valuable part of the IT Capstone Project, as it formed the basis of the entire process.

Table 5. Frequency and Percentage Distribution on the Challenges faced in completing the IT Capstone Project

INDICATOR	FREQUENCY	PERCENTAGE
Time Management	41	41.8 %
Technical Difficulties	22	22.4 %
Research and Data Gathering	18	18.4 %
Team Collaboration	13	13.3 %
Documentation and Reporting	4	4.1 %
TOTAL	**98**	**100 %**

Table 5 reveals that the primary challenge that the students encountered was related to Time Management, with 41.8% of the students citing it as a difficulty. Other challenges that the students encountered were Technical Difficulties (22.4%), Research and Data Gathering (18.4%), Team Collaboration (13.3%), and finally, Documentation and Reporting (4.1%). Therefore, the above challenges reveal that the students were able to overcome the technical and collaboration challenges but were challenged mostly by time management.

Table 6. Frequency and Percentage Distribution on the IT Capstone Project Research Writing Process be Improved for Future Students

INDICATOR	FREQUENCY	PERCENTAGE
More Guidance and Mentorship	38	38.8 %
Step-by-Step Workshops	28	28.6 %
Better Time Allocation	3	3.1 %
Improved Collaboration Tools	16	16.3 %
Access to Resources	13	13.3 %
TOTAL	**98**	**100 %**

As shown in Table 6, More Guidance and Mentorship (38.8%) and Step-by-Step Workshops (28.6%) were the two most important recommendations by the students for the improvement of the Capstone process for future students. Other recommendations included Improved Collaboration Tools (16.3%), Access to Resources (13.3%), and Better Time Allocation (3.1%). These results emphasize the role of guidance, mentorship, and workshops for the effective completion of the Capstone Project by the students.

Table 7. Significant Difference in Students' Perceived Usefulness, Attitude and Effectiveness by Challenges in IT Capstone Research Writing

Dependent Variables	F-value	p-value	Interpretation
Perceived Usefulness	1.40	0.270	Not Significant
Attitude Towards IT Capstone Writing	2.41	0.810	Not Significant
Perception of Effectiveness	1.87	0.159	Not Significant

The results shown in Table 7 reveal that there is no significant difference in students' perceived experiences in IT Capstone research writing in terms of the various challenges they faced. The F-values for Perceived Usefulness (1.40, p = 0.270), Attitude Towards Capstone Writing (2.41, p = 0.810), and Perception of Effectiveness (1.87, p = 0.159) are all greater than 0.05. This implies that students' perceptions of usefulness, attitudes, and effectiveness are relatively consistent in terms of the type of challenge they faced in the Capstone Project.

Table 8. Significant Difference in Students' Perceived Usefulness, Attitude and Effectiveness by Highlights in IT Capstone Research Writing

Dependent Variables	F-value	p-value	Interpretation
Perceived Usefulness	2.44	0.072	Not Significant
Attitude Towards IT Capstone Writing	2.01	0.119	Not Significant
Perception of Effectiveness	1.97	0.128	Not Significant

As indicated in Table 8 above, there is no significant difference in students' experiences in terms of the part of the Capstone Project they found most helpful (highlights). The F-values for Perceived Usefulness (2.44, p = 0.072), Attitude Towards Capstone Writing (2.01, p = 0.119), and Perception of Effectiveness (1.97, p = 0.128) are all greater than 0.05. This shows that there is no statistical significance in students' perceptions of usefulness, attitude, and effectiveness.

CONCLUSION

The study revealed that the experiences of the students in IT Capstone Project research writing were generally positive in terms of Perceived Usefulness, Attitude, and Perception of Effectiveness. Students agreed that the IT Capstone Project improved their problem-solving skills, technical writing skills, research skills, and professionalism, as well as creating a positive attitude towards research despite the challenges that may come. Moreover, the study revealed that the most helpful part of the Capstone Project for the students was the Project Planning and Proposal, and that Time Management was the biggest challenge for the students. Moreover, the study revealed that the students suggested that the IT Capstone Project should be improved by providing more guidance, step-by-step workshops, and better collaboration tools. Furthermore, the study revealed

that there were no significant differences in terms of experiences in IT Capstone Project research writing based on the kind of challenge that the students experienced and the part of the Capstone Project that the students found the most helpful, showing that the experiences of the students were consistent. In conclusion, the IT Capstone Project is an important and effective part of the IT curriculum.

FURTHER STUDY

While this study shed some light on the experiences of the students with regard to IT Capstone Project research writing, further research is recommended to further investigate other factors and perspectives:

1. Tackle the long-term effect of Capstone on the career preparedness and professional competence of the students.
2. Tackle qualitative research to further understand the challenges, approaches, and intentions of the students with regard to completing their Capstone projects.
3. Tackle the potency of interventions such as mentorship programs, workshops, and collaborative tools to improve the Capstone experiences of the students.
4. Tackle technology-enhanced approaches to improve Capstone experiences.

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