The Formation Process of Research Self-Efficacy in Undergraduate Students: A Qualitative Study

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ABSTRACT

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| **Background:** In today’s academic environment, digital competence has also become integral to student research performance. Many undergraduates rely on digital tools to locate information, structure arguments, and complete technical tasks. The essential component in the development of research self-efficacy is metacognitive awareness particularly in how students approach reading and processing academic texts.**Aims:** This study aims to explore how undergraduate students develop research self-efficacy by examining the lived experiences, challenges, and coping strategies that shape their confidence and competence as novice researchers within the Philippine higher education context.**Study design:** A qualitative case study design was utilized to provide an in-depth, contextually rich understanding of students’ journeys throughout the undergraduate research process**Place and Duration of Study:** The research was conducted at a state-funded college in Zamboanga del Sur, Philippines, with data collection spanning the 2023–2024 academic year.**Methodology:** Ten undergraduate students who had completed the thesis process were purposively selected. Data were collected through in-depth, semi-structured interviews. Verbatim transcripts were analyzed using Braun and Clarke’s (2006) thematic analysis framework to identify recurring patterns, organize categories, and construct themes reflecting the development of research self-efficacy.**Results:** Thematic analysis revealed five interconnected themes: (1) the critical role of mentorship and adviser support; (2) the impact of experiential learning and overcoming setbacks; (3) the use of digital tools and information literacy in facilitating research tasks; (4) the development of metacognitive reading strategies; and (5) the importance of milestone achievements in affirming research confidence. These findings illustrate that research self-efficacy emerges from ongoing mentorship, hands-on engagement, adaptive use of technology, purposeful reading, and the accomplishment of meaningful academic tasks.**Conclusion:** Research self-efficacy among undergraduates is a dynamic outcome shaped by supportive relationships, practical experience, digital competence, reflective strategies, and validation through achievement. Institutions should foster environments that provide both technical guidance and emotional support to help students build lasting research confidence and identity. |

*Keywords: Research Self-Efficacy, Undergraduate Students, Qualitative Case Study, Mentorship, Digital Competence*

1. INTRODUCTION

Academic achievement has long been a focal point of scholarly inquiry. Learning engagement has been recognized as a crucial motivational factor influencing students’ academic outcomes. However, the mechanisms through which research self-efficacy affects academic achievement, particularly via learning engagement, remain underexplored (Alsalim et al., 2024; Miao et al., 2025). Research is a critical component of undergraduate education, enabling students to develop inquiry skills, contribute to knowledge creation, and prepare for academic or professional pathways. However, many students encounter research as an unfamiliar and challenging task. Common barriers include limited prior exposure to research procedures, difficulties in formulating research problems, and low confidence in navigating academic tasks, particularly during the early stages of the research process. These uncertainties often lead to anxiety and disengagement (Maharajan et al., 2017). In this context, research self-efficacy, defined as a student’s belief in their capability to conduct research successfully, becomes a vital construct that influences persistence, engagement, and success (Bandura, 1997; Livinți et al., 2021). Self-efficacy consists of an individual's confidence in his or her ability to effectively engage in behaviours towards desired goals. Self-efficacy research has consistently shown the predictive nature of students' self-efficacy beliefs in career entry behaviours, such as university degree choices and academic performance (Álvarez-Huerta et al., 2019).

Bandura’s (1997) theory of self-efficacy identifies four key sources that shape efficacy beliefs: mastery experiences, social persuasion, vicarious learning, and emotional states. In the academic setting, these are reflected in students’ experiential learning opportunities, the support they receive from research mentors, and their ability to regulate emotions during setbacks. For instance, adviser encouragement and consistent feedback serve as powerful forms of social persuasion that validate students’ capabilities and motivate them to persevere (Mason & Merga, 2021; Ren & Li, 2024). Persistent engagement in research activities, despite setbacks and emotional struggles, enables novice researchers to overcome self-doubt by gradually rebuilding confidence and reinforcing their researcher identity through continuous learning and professional growth (Lu & Zhang, 2024).

In today’s academic environment, digital competence has also become integral to student research performance. Many undergraduates rely on digital tools to locate information, structure arguments, and complete technical tasks (Guillén-Gámez et al., 2023; Adekunle & Madukoma, 2022). While these tools enhance accessibility and efficiency, insufficient training in academic digital literacy can create new forms of anxiety, particularly when students struggle to critically evaluate sources or use discipline-specific platforms (Zhao et al., 2021; Seraji et al., 2017).

Another essential component in the development of research self-efficacy is metacognitive awareness, particularly in how students approach reading and processing academic texts. Those who develop purposeful strategies, such as identifying key sections or monitoring comprehension, are better able to understand complex literature and integrate it into their work. This reflective reading behavior is associated with stronger academic confidence and sustained research engagement (Mokhtari & Reichard, 2002; Djudin, 2018; Al-Kiyumi et al., 2021).

While prior studies have investigated factors influencing students’ research self-efficacy, most rely on quantitative methods that overlook the developmental nature of students’ experiences. There remains limited understanding of how students build confidence, particularly through the lens of their voices, within the Philippine higher education context. Addressing this gap, the present study explores how students overcome research-related challenges as part of their journey toward becoming confident, capable researchers. Using a qualitative case study design, the study examines the lived experiences of undergraduate students. By uncovering how research self-efficacy is formed through daily academic struggles and breakthroughs, the study provides insights into how institutions can better foster equitable, empowering research environments for undergraduate learners.

2. methodology

This study employed a qualitative case study design to explore how undergraduate students develop self-efficacy in conducting research. A case study approach is particularly suited for this inquiry as it facilitates an in-depth and contextually rich exploration of a bounded system—a specific group of students who have completed their undergraduate thesis writing process (Stake, 1995; Yin, 2012). As Creswell (2014) posits, qualitative research seeks to understand and describe the meaning individuals assign to a phenomenon within its natural context. This study focuses on capturing the narratives of students as they navigate the research journey, offering insights into their thoughts, emotions, and learning experiences.

The research was conducted in a state-funded college in Zamboanga del Sur, involving ten (10) undergraduate students selected through purposive sampling. All participants had completed the research process, from proposal writing to final defense, including manuscript revisions and finalization. To ensure ethical rigor, participants were selected based on their willingness to participate voluntarily, with informed consent obtained before the interviews. The study adhered to ethical standards by safeguarding participant confidentiality, clarifying their rights, and allowing withdrawal at any time without consequence.

Data were gathered using in-depth interviews guided by a researcher-developed, semi-structured interview protocol. The guide contained open-ended questions that aligned with the study’s objectives and were validated by qualitative research experts. The interviews were conducted by the researcher, who also facilitated the documentation process through both written notes and audio recordings, ensuring the accuracy and authenticity of participants' responses. Each interview was conducted in a setting comfortable for the participant, promoting openness and trust.

The recorded interviews were transcribed verbatim and analyzed following Braun and Clarke’s (2006) six-phase framework for thematic analysis. This approach involved a recursive, systematic process that began with familiarization through repeated reading of the transcripts, followed by the generation of initial codes across the dataset. These codes were then collated into potential themes, which were reviewed, refined, and defined to capture the nuanced ways in which students developed research self-efficacy. Particular attention was paid to identifying patterned meaning across participants’ accounts while also preserving the uniqueness of individual narratives. Themes were interpreted not only in terms of their conceptual significance but also chronologically, to illuminate how students’ confidence evolved over time as they engaged with the research process.

Ethical standards were strictly observed throughout the study. The research protocol was reviewed by experts in studies involving human subjects, particularly those addressing sensitive academic and emotional experiences. The principles of credibility, dependability, confirmability, and transferability were applied to ensure the trustworthiness of the findings (Lincoln & Guba, 2011). To uphold confidentiality, participants’ names and identifying details were anonymized in all stages of data handling and reporting. By ensuring voluntary participation, transparency, and protection from harm, the study prioritized both ethical integrity and the well-being of the participants. Through this approach, the study aimed to generate meaningful, context-specific insights into how students “learn to believe” in their capacity to undertake academic research.

3. results and discussion

### This study examined how undergraduate students develop research self-efficacy through their experiences, the challenges they face, and the support systems available to them. Guided by Bandura’s (1997) theory of self-efficacy, the findings highlight six interconnected themes that show how students gradually build confidence in their research abilities.

### **1. The critical role of mentorship and adviser support**

Participants emphasized the important role that research advisers and mentors play in shaping their research experience and boosting their confidence. Having an approachable and supportive mentor was seen as essential, not just for technical guidance, but also for giving emotional support during challenging parts of the research process.

As P1 explained, “The guidance we received from our instructor and mentor was important in accomplishing this research. Their scaffolding helped us to gain insights into even the tiniest aspects of our research.” Another added, “The advice or the steps that they gave us helped us to really make sure that we are on the right track” (P1). These accounts illustrate Bandura’s (1997) concept of **social persuasion**, wherein credible feedback and encouragement from respected figures strengthen students’ belief in their abilities.

Even so, when advisers affirm and appreciate their students, it helps foster a sense of belonging and motivation, both of which are critical for student well-being, especially given the stressful and demanding nature of research (Cohen & Sherman, 2014; Osterman, 2023). Students often see advisers as effective mentors who clarify expectations, help manage deadlines, and provide technical advice on research. As P7 shared, “Sir would attend to our papers… we never felt like our efforts were neglected,” while P6 noted, “With their help, especially our thesis adviser and our statistician, we came up with a rewarding result.”

More than academic instruction, mentors also served as a source of confidence and motivation. As P5 put it, “My adviser had so much confidence in us… He believed we could really do it. That’s why he had us present at the colloquium—and we received the Best Thesis award.”

Recent research continues to support this idea. For example, Mason and Merga (2021) showed that when students get consistent encouragement, timely feedback, and chances to observe and model good research practices, their confidence in their research abilities grows significantly. Similarly, Ren and Li (2024) found that mentoring and a supportive academic environment boost students’ engagement and skill development by improving their self-efficacy. In the context of doctoral education, Adekunle and Madukoma (2022) observed that strong adviser-student relationships help students build key research skills and promote perseverance.

The students’ voices make it clear that adviser support was not merely instructional—it was transformational. The combination of technical assistance, timely feedback, emotional encouragement, and genuine belief in students’ potential helped foster a sense of academic security and motivation. These experiences affirm that effective mentorship is central to building research self-efficacy, particularly for novice researchers navigating uncertainty (Cypress, 2020; Tenorio‐Lopes, 2023). When students feel guided, valued, and empowered, they are more likely to persist, grow, and view themselves as capable contributors to scholarly work.

### **2. Impact of experiential learning and overcoming setbacks**

The journey toward research competence often began in a state of ambiguity and uncertainty. For many students, the early stages of the research process—particularly identifying a research problem, formulating objectives, and reviewing related literature—felt overwhelming. Without prior experience, they struggled with where and how to begin. However, through continuous engagement, repeated practice, and the willingness to revise and learn from feedback, students gradually developed a stronger understanding of research procedures and grew in confidence. This reflects Bandura’s (1997) concept of **mastery experiences**, which are considered the most powerful source of self-efficacy.

As P1 reflected, “Before we started our research, everything felt ambiguous. We had an idea of what research was, but we didn’t know how to actually do it.” P7 added, “At the start, ma'am, it felt really difficult… But once you got your plan together and reached the middle, after interpreting all the data, it became so fulfilling.” These accounts show how learning is built progressively, with competence emerging from repeated exposure to challenging but achievable tasks.

Students also recognized the value of setbacks in deepening their learning. P9 described a major disruption in their process: “Our chickens died in the middle of our research… but we reconducted it. We felt pressure, but we learned more the second time around.” Similarly, P10 noted, “It’s stressful, ma’am, but if you just focus on getting past it, you gain a lot of learning you can use in the future.” These experiences illustrate how perseverance in the face of difficulty leads not only to task completion but also to growth in self-belief.

Prior studies have shown that practical experiences with research tasks—such as designing instruments, analyzing data, or refining arguments—are linked to higher levels of research self-efficacy, particularly when these experiences are accompanied by opportunities for reflection and feedback (Hill et al., 2022; Robnett et al., 2015). In the present study, students also emphasized how instructor guidance was essential in helping them understand and navigate complex research components. When advisers provide clear instructions, assist students in managing their time, and support the development of specific research skills, students are better equipped to succeed and feel more confident in their ability to complete academic tasks (Thiry & Laursen, 2011; Miraj et al., 2022; Swan et al., 2018).

Students’ reflections reveal that research self-efficacy is not developed overnight. It is built gradually, through experience, feedback, reflection, and perseverance. The more students engage in real research tasks—whether successful or not—the more they come to understand the process, trust in their capabilities, and internalize the mindset of a researcher. For higher education institutions, this highlights the importance of experiential learning opportunities, supportive mentorship, and a classroom culture that embraces mistakes as part of the learning process.

### **3. Use of Digital Tools and Information Literacy in Facilitating Research Tasks**

Students in this study reported frequent and strategic use of digital tools to navigate the demands of academic research, especially in contexts where institutional support or physical resources were limited. These tools, ranging from online databases to artificial intelligence applications, played a significant role in helping students locate information, understand difficult concepts, manage references, and complete technical tasks more efficiently.

As P4 shared, “If you don’t know how to navigate websites… you really won’t be able to gather other related studies.” Tools like Gemini were especially useful in overcoming language barriers, as students used AI to translate responses and simplify academic texts: “We transcribed manually, but for translation, we used AI. It really helped a lot.” P6 echoed this, saying, “I use ResearchGate and ProQuest… and I utilize artificial intelligence to find resources and help explain information I find difficult to understand.” Despite these benefits, students were also aware of potential limitations. As P9 noted, “We used AI… but we made sure to verify everything because it might not be accurate.”

These insights are consistent with previous research emphasizing the value **of digital competence** in shaping students’ confidence and productivity in academic work. Seraji et al. (2017) found that students with well-developed technological research skills were more confident in conducting research and experienced fewer barriers to academic engagement. Similarly, Guillén-Gámez et al. (2023) concluded that effective integration of digital tools into research—when accompanied by ethical use and critical evaluation—significantly contributes to research self-efficacy and performance.

Moreover, Adekunle and Madukoma (2022) identified a strong positive link between **information literacy** and research productivity among postgraduate students, with self-efficacy serving as a critical mediating factor. Their findings suggest that students who feel capable in locating, evaluating, and using information are more likely to persist in and complete research projects successfully.

However, while students in this study demonstrated basic digital fluency, their reflections also point to the need for more advanced skills. As Zhao et al. (2021) observed, many students still lack higher-order digital competencies, such as evaluating scholarly sources, using discipline-specific software, or managing citations systematically.

Students’ use of digital tools was not merely a matter of convenience but a key enabler of research engagement and confidence. However, maximizing the potential of these tools requires targeted instruction in digital literacy and critical evaluation, ensuring students not only use technology, but use it well.

### **4. Reading with a Purpose: Metacognitive Awareness in Action**

One of the indicators of students’ growing research self-efficacy was their shift from passive to strategic reading. Faced with large volumes of dense academic texts, students developed metacognitive reading strategies to manage complexity and extract relevant information more efficiently. This involved setting clear reading goals, monitoring comprehension, and focusing on key sections of the text—practices that reflect metacognitive regulation (Flavell, 1979; Mokhtari & Reichard, 2002).

P10 explained, “We read the abstract and conclusion first… if it was related, we used it.” Similarly, P6 shared, “I really read carefully the results and conclusion… to pick up relevant information and theories.” These statements reflect an intentional focus on essential parts of the text to maximise relevance and minimise cognitive overload.

As students gained more experience, their reading became more analytical. P8 emphasized, “You need to use your critical thinking skills… so you can genuinely relate it to your study.” This demonstrates how students began actively engaging with texts, not just to gather content, but to evaluate and connect it to their research objectives—an important aspect of metacognitive engagement.

Such strategies align with findings that students who employ focused and reflective reading practices tend to perform better in academic tasks (Al-Kiyumi et al., 2021). These habits also support their confidence in navigating research literature, especially when they can independently determine what to read deeply and what to skim (Sear, 2024). Moreover, when faced with unfamiliar or abstract concepts, students adjusted their approach, often rereading or seeking clarification—evidence of adaptive metacognitive behavior. As Djudin (2018) points out, metacognitive awareness becomes especially valuable when learners must move beyond routine methods to deal with new or complex tasks.

Students’ evolving reading strategies played a significant role in enhancing both their understanding and their research self-efficacy. By reading with intention and applying cognitive control, they were able to engage more deeply with academic texts, improve information retention, and strengthen the connection between literature and their own research work.

### **5. Importance of milestone achievements in affirming research confidence**

As students progressed in their research journey, key milestones served as pivotal moments that affirmed their developing sense of competence. Achievements such as defending their thesis, presenting in a colloquium, or simply seeing their work hardbound were more than symbolic—they were tangible outcomes that reinforced their belief in their research ability and marked important stages of personal and academic growth.

P1 reflected, “When our thesis was hardbound, we could truly tell ourselves, ‘Ah, we really can do something.’” For P5, the process of completing the thesis offered broader academic benefits: “I realized that research is useful… it develops writing skills and helps with public speaking. It really helps students.” P6 recalled the affirmation that followed a difficult project: “Our research was complicated, but we accepted the challenge… and when we finished, our adviser told us, ‘See, I told you.’”

These experiences reflect what Bandura (1997) termed **performance accomplishments**—the most powerful source of self-efficacy development. As students begin to see the results of their hard work and receive recognition from others, they internalize a sense of academic competence. These moments help transform initial feelings of self-doubt into confidence, reinforcing the belief that they are capable of engaging in meaningful scholarly work. According to Livinți et al. (2021), such experiences—especially when supported by structured mentorship and training—significantly contribute to the development of research self-efficacy. In this study, milestones such as thesis completion and adviser praise not only signified success but also fueled students’ motivation to participate in future research.

Beyond personal accomplishment, the validation students received from mentors and academic audiences played a key role in enhancing their confidence and sense of belonging. Recognition from faculty, peer acknowledgement, or awards gave students the impression that their work mattered and that they were legitimate contributors to the academic community. This aligns with studies showing that encouragement and affirmation from mentors strengthen students’ self-concept as emerging researchers (Stiwich & Ross, 2022; Albert, 2017; Hsu et al., 2021). As students in this study experienced these affirming interactions, they began to view themselves not just as learners fulfilling a requirement, but as capable individuals contributing to knowledge production. Thus, accomplishments were not simply the end of a task—they became defining points in students’ evolving research identity.

4. Conclusion

This qualitative case study provides an in-depth exploration of how undergraduate students in a Philippine state college develop research self-efficacy as they progress through the academic research process. By focusing on the lived experiences of a purposively selected group of students who completed the undergraduate thesis journey, the study offers a context-rich understanding of the factors and turning points that shape research confidence. Anchored in Bandura’s (1997) theory of self-efficacy, the case analysis reveals that research self-efficacy is not a static trait but an evolving capacity, forged through a dynamic interplay of mentorship, hands-on learning, digital engagement, strategic reading, and milestone accomplishments. The narratives collected highlight the pivotal role of supportive advisers and mentors, who provided both technical guidance and emotional encouragement. Experiential learning—marked by setbacks, revisions, and moments of uncertainty—emerged as a crucial foundation for building resilience and competence.

Additionally, the case study documents how students strategically employed digital tools and developed metacognitive reading strategies to navigate academic challenges and manage complex information. These adaptive strategies not only facilitated the research process but also contributed to students’ growing confidence in their scholarly abilities. Achieving significant milestones, such as the completion and defense of a thesis, further validated their identity as capable researchers. The findings suggest that the development of research self-efficacy is a holistic and contextualized process, deeply embedded in the students’ social and academic environments. The case study approach enabled the uncovering of nuanced insights into how self-efficacy is strengthened not by the absence of obstacles, but by overcoming them with the support of mentors, the use of digital resources, and the validation of achievement. For higher education institutions, these insights point to the importance of fostering supportive, resource-rich, and reflective learning environments that empower students not only as learners but as emerging scholars ready to contribute meaningfully to the research community.

Ethical approval and consent

This study was reviewed and approved by the appropriate research ethics committees of Northwestern Mindanao State College of Science and Technology (NMSCST) and J.H. Cerilles State College (JHCSC). To ensure ethical rigor, participants were selected based on their willingness to participate voluntarily, with informed consent obtained before the interviews.

**Disclaimer (Artificial intelligence)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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