Strengthening Research Capacity and Pedagogical Innovation Among Pre-service English Teachers in Polytechnic University of the Philippines: An Exploratory Study

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ABSTRACT

This study examined the impact of research related experiences, attitudes, problems, and opportunities on pre-service English teachers' research capacity and pedagogical innovativeness. It was rooted in Schön's reflection-on-action and the Technological Pedagogical Content Knowledge (TPACK), and investigated how a teacher education program cultivates reflective and research-informed, and innovative, teachers. A qualitative narrative inquiry design was used. In-depth interviews were conducted with twelve fourth year Bachelor of Secondary Education major in English students from each of the Polytechnic University of the Philippines (PUP) Manila and Taguig campuses who completed research courses and practice teaching. Analysis of the transcripts was conducted using the five steps of Creswell and Creswell and some codes were grouped as reflection-on-action and TPACK, while emergent ones remained. Results indicate that research shifted participants' perspectives from pressure and fear to systematic, evidence-based and appreciative perspectives, while some perceived the research as an obligation to them as professionals. Research was created jointly and needs were found to differ among program pathways. Participants used coursework as a way of applying technology to specific content and purpose and modified their practice to fit the unpredictable school environment, reflecting on lessons after practice. They also saw research as a reflection of the self and as preparation for various classrooms.

Time constraints, recruitment challenges, monetary constraints, database problems, variability in advisers guidance and poor infrastructure were all identified as challenges. These, however, were balanced by research to enhance the preparation of lessons, confidence, and adaptive instruction. The study findings suggest that research capacity and reflective practice can go hand in hand to enable pedagogical innovation, but the link between research capacity and reflective practice and its application to the classroom requires institutional resources, mentorship and field exposure. Suggestions for implementation are: to have consistent research courses with advisers, increase data base access, provide early field exposure, and research timelines to include practicum, and to evaluate classroom technology.

Keywords: Pre-service English Teachers, Research Capacity, Pedagogical Innovation, Reflection-on-Action, Technological, Pedagogical, and Content Knowledge (TPACK)

INTRODUCTION

Research skills and innovative teaching practices are central to preparing effective and adaptable teachers. Education programs therefore need to build the professional skills that today's classrooms demand, not only subject content [1], [2]. Pedagogical innovation reflects teaching that is both creative and adaptable, as educators adjust lessons and strategies to diverse learners, societal change, and evolving technologies [3]. In the Philippines, the Philippine Professional Standards for Teachers (PPST) emphasize engagement in research and the use of new teaching strategies [4], and teacher education institutions have accordingly sought to develop research-oriented and innovative pre-service teachers.

Still, a gap persists between learning research theory and applying it in real settings. Technology-integrated workshops have improved pre-service science teachers' contextualized pedagogy, although infrastructure and skill gaps remain [5].

Teachers in a Philippine public-school division were found to have limited research skills that improved mainly through actual research experience [6]. Filipino pre-service teachers often show low research proficiency, and few complete their research because of skill difficulties and time constraints [7]. Pre-service physical education teachers have described research as emotionally challenging and needing technical support [8], and many treat research as a graduation requirement rather than a meaningful learning experience [9]. Little is known, however, about how these dynamics play out among pre-service English teachers, whose work combines language, literature, and pedagogy.

Context and Alignment

This study is anchored on the Polytechnic University of the Philippines (PUP) Strategic Goal 1 (Innovative Curricula and Instruction) and Strategic Goal 4 (Intensified Research Innovation, Dissemination, and Utilization) and the United Nations Sustainable Development Goal 4 (Quality Education), the NEDA Ambisyon 2040 vision of an innovative and globally competitive workforce. It discusses the strengths, challenges and needs of the pre-service English teachers in PUP Sta. Mesa (Manila) and Taguig Campuses for pedagogical and research innovations.

THEORETICAL FRAMEWORK

This study is based on two theories. The theoretical framework Reflective Practice Theory is based on the differentiation between reflection-in-action, which means the adjustment of performance in real time, and reflection-on-action, which means a purposeful review of an action after it has been performed [10], [11]. The present study is framed within reflection-on-action as engagement in research is expected to foster the development of habits of critical reflection and, with them, research capacity [12].

The Technological Pedagogical Content Knowledge (TPACK) framework argues that effective teaching is a combination of technology, pedagogy and content knowledge [13]. It provides a framework for assessing which technologies are best suited to support content delivery [14]. Together, the two theories explain how research capacity impacts reflective thinking, which results in pedagogical innovation as teachers review and adjust their own strategies.

Objectives

The study was conducted to answer the following five questions on pre-service English teachers in PUP:

- Which research-related activities in the program helped shape how they understand and conduct research?
- What are their views on the program's effectiveness in developing research skills and innovative teaching practices?
- How do they perceive the role of research capacity in encouraging innovative and reflective teaching?
- How do curriculum programs help them develop innovative teaching strategies for future classroom use?
- What challenges and opportunities do they face when participating in research activities supported or promoted by their school or university?

Significance and Scope

The findings can inform pre-service teachers, College of Education faculty and research advisers, PUP administrators, the Commission on Higher Education (CHED), and future researchers in designing research training and internship support. The study is limited to fourth-year BSEd English students of the Manila and

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Taguig campuses and to the accounts of twelve participants, so it describes their experiences and does not seek statistical generalization.

METHODS

Research Design

The study used a qualitative narrative research design. Qualitative inquiry explores how individuals interpret, experience, and shape their social world [15], and narrative research examines how people make meaning of lived experience through stories. Narrative inquiry served as the analytic lens for examining the progression, themes, and meanings within participants' accounts of research capacity and pedagogical innovation.

Participants

Twelve pre-service English teachers (labeled Participants A to L) took part, six from the PUP Taguig Campus and six from the PUP Manila (Sta. Mesa) Campus. All were fourth-year Bachelor of Secondary Education major in English students who were undergoing practice teaching and had conducted or taken part in research activities such as thesis writing, research methods courses, action research, literature reviews, and research presentations.

Several were research leaders or had received research-related awards. Students from other education majors, students not enrolled at PUP or not in their fourth year, those who had not completed their research courses, and those without internship or practice teaching experience were excluded. A sample of twelve is consistent with the recommendation that about twelve interviews can reach saturation in qualitative research [16], [17]. The researchers were enrolled in the same program, which gave them familiarity with program experiences.

Instrument and Data Collection

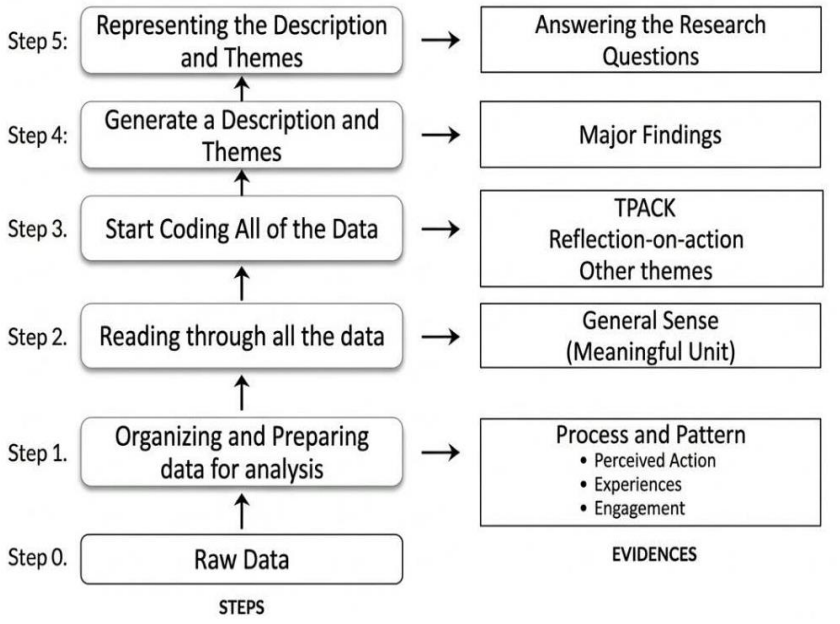
Interviews that were conducted were in-depth and semi-structured to provide detailed accounts of perceptions and opportunities for follow-up questions [18] and [19]. There were a total of eleven open-ended questions on the interview guide, of which five were main questions, four probing and two closing questions, all corresponding to the statement of the problem.

The primary issues included participants' knowledge of research, the importance of research capacity in pedagogy, the difficulties in conducting research, exposure to innovative pedagogy during internship and the improvement of internship for pedagogical innovation. Interviews were recorded and transcribed verbatim with the consent of the interviewees. Some participants used English and Filipino in their speech; the speech is reported in their own words

Data Analysis

Transcripts were analyzed with the five-step process of Creswell and Creswell [20], summarized in Table 1. Codes were clustered under the two theoretical frameworks, reflection-on-action and TPACK, and codes that fit neither were examined as emergent themes.

Figure 1. Data analysis procedure adapted from Creswell and Creswell



Use of Artificial Intelligence

In line with PUP Executive Order No. 46, s. 2024, the researchers disclose that generative AI tools were used only for limited tasks: checking alignment of the research questions, locating literature, comparing methodological options, organizing interview data, checking alignment of findings with the research questions, supporting code and theme refinement, and improving grammar. AI tools were not used to collect data or make research decisions. The researchers reviewed and verified all AI-assisted output and remained responsible for the analysis, interpretation, and final presentation of findings.

RESULTS

The twelve interviews yielded 38 themes across the five research questions. Tables 2 to 6 list them, grouped by the clusters used in the analysis; the paragraphs after each table describe the main patterns, with participants identified by letter.

Research question 1: Research-related activities that shaped understanding of research

Table 1. Themes on how program research activities shaped participants' understanding of research

Cluster	Theme	Key finding
Definitions	Research experiences as a basis for professional growth	Participants B, C, F, I, and L moved from pressure, fear, or limited understanding toward systematic, evidence-based, and appreciative views of research
Definitions	Research engagement as a professional responsibility	Participants A and K linked continued research to DepEd requirements and the legal duty of continuous learning
Definitions	Research as systematic, evidence-based, and ethical practice	Participants D and E defined research by procedure, evidence, ethics, and credibility
Definitions	Developing research practices through	Participants A, F, and J described research as built with groupmates, respondents, a

	collaboration	wider circle of people, or a single mentor
Activities	Assigned research areas as a basis for collaborative topic selection	Participants B and C received a broad area (gender equality in the classroom) and coordinated sub-topics to avoid overlap
Activities	Applying research-based knowledge to gender-fair language	Participants A and F found that awareness of gender-fair language did not reliably lead to its use in teaching materials
Activities	Variation in the structure and completion of research requirements	Participants G and K described different formats (IMRAD article or five-chapter thesis) and assessments (defense, conference, colloquium)
Activities	Research engagement as a source of personal and professional growth	Participants D, E, and J reported fulfillment, pride, or recognition from teaching, presenting, or leading research

Most participants described a before-and-after pattern. Participant I recalled that reading journal articles revealed a more effective approach for a thesis, realizing "importante talagang maghanap muna ng evidence bago mag-decide," and carried this into teaching by no longer choosing activities simply because they were seen online. Participant B learned to slow down and be systematic and careful in finding solutions instead of reacting under pressure, and Participant L moved from fear and limited involvement in third-year research to teaching research content to students. Other participants framed research as an obligation ("it is actually our responsibility as a teacher," Participant K), although Participant A also saw it as a way to keep learning. Participant J credited a former teacher with defining research as "like grocery shopping" for new teaching strategies. Participant E described presenting at conferences as fulfilling because it affirmed the purpose of the group's work.

Research question 2: Views on the program's effectiveness

Table 2. Themes on the program's effectiveness in developing research skills and innovative teaching

Cluster	Theme	Key finding
Program support	Applying research and program experiences to improve teaching practices	Past research findings and practice-teaching challenges informed present teaching; one finding that a 40-student class policy did not support learning left a participant unsettled
Program support	Research engagement as a source of innovative practice	Research encouraged resourcefulness and exposed limits of established practices, though institutional policies could restrict applying research-based ideas
Program support	Application of coursework in teaching practice	Concepts from the courses AIL and TTL were applied, from specific techniques (e.g., rewards for participation) to broader lesson design
Program support	Adaptive teaching in real-world practice	Innovation meant adapting to repeated power interruptions and teaching outside the

		English major
Recommendations	Institutional barriers to research support	Limited database access and budget constraints, attributed to institutional support rather than student effort
Recommendations	Expanding research mentorship and specialized guidance	Accessible, consistent mentoring, plus peer support, workshops, real-life examples, and consultation
Recommendations	Strengthening research-informed teacher preparation through field exposure	Earlier and extended exposure to actual school settings, and more time for research
Recommendations	Developing a positive mindset toward research	Treating research as learning rather than only a graduation requirement; confidence helps, fear limits

Participants believed that the program offered knowledge applicable to practice, but also pointed out that real schools differ from the coursework. Their recommendations centered on institutional resources, consistent mentoring, earlier field exposure, and a more positive attitude toward research.

Research question 3: Role of research capacity in innovative and reflective teaching

Table 3. Themes on research capacity, reflection, and innovation

Cluster	Theme	Key finding
Understanding the field	TPACK-based integration of technology in teaching practice	Kahoot and Quizizz were used in literature read-alouds, and AI was used to check students' answers and research papers
Understanding the field	Reflection-on-action as a basis for revising teaching practice and professional perspectives	Lessons that proved too difficult or left students disengaged were revised; research came to be valued once its career relevance was clear
Understanding the field	Research as a basis for understanding language, literature, and pedagogy	Research was seen as a web connecting language, literature, and pedagogy and as a way to find effective strategies
Understanding the field	Research as a continuous practice for professional and teaching development	Research was an ongoing part of being a teacher, not a task that ends at submission
Reflective pathway	Reflection-on-action through concrete, retrospectively evaluated experiences	Narrative writing (daily in field study, weekly in internship) and reflection on confusing instructions led to changes in later practice
Reflective pathway	Research as an inherently reflective process	Identifying a problem, testing solutions, and checking changes was described as both research and reflection

Reflective pathway	Research as preparation for future and diverse teaching situations	Research on teachers of students with special education needs, and wider knowledge, supplied strategies for unfamiliar classrooms
Insights	Developing professional identity through lived practice	Teacher identity was learned in the classroom, and every class differs, so learning continues

Two patterns stand out. Participants tied technology to specific content and purposes, which reflects TPACK, and they revised lessons and views after looking back on them, which reflects reflection-on-action. For several, research and reflection were nearly the same activity: both begin with a problem, try a solution, and check whether change is needed.

Research question 4: Curriculum support for innovative teaching strategies

Table 4. Themes on exposure to and enhancement of innovative teaching strategies

Cluster	Theme	Key finding
Internship exposure	Integrating TPACK into teaching practice	The most frequent pattern: technology used to gain attention, prepare presentations, record scores, post announcements, and make lessons interactive
Internship exposure	Reflection-on-action for improving teaching practice	Intentional changes, such as more varied game-based activities and a new assessment platform, followed observed outcomes
Internship exposure	External constraints in applying innovative teaching strategies	Insufficient equipment, lack of internet connection, and unequal student access limited technology use
Teaching abilities	Technology integration for improved teaching practice	Technology supported learning, efficiency, classroom management, and engagement
Teaching abilities	Technology-content integration for specific instruction	Technology was used in English vocabulary and Creative Writing, and digital materials replaced paper
Teaching abilities	Recognizing gaps and adapting instructional practice	Gaps in provided modules and differences in material preparation between Taiwan and the Philippines led to pair groupings and student reporting
Teaching abilities	Understanding the facilitator role in teaching practice	A learner-centered view in which the teacher guides rather than only informs

Participants used tools such as Kahoot, Quizizz, Canva, and Google Classroom for specific subjects including literature, grammar, vocabulary, and Creative Writing. How far these practices could be sustained depended on equipment, connectivity, and students' access to devices, and not only on the teacher's effort.

Research question 5: Challenges and opportunities in research participation

Table 5. Themes on challenges encountered and research-informed teaching practices

Cluster	Theme	Key finding
Challenges	Limited research time due to academic demands	Research competed with coursework, practice teaching, and internship duties
Challenges	Challenges in accessing, engaging, and retaining participants	Recruiting respondents, their willingness to disclose information, and keeping them engaged were difficult
Challenges	Financial and informational resource barriers	Paywalled journal articles, repeated printing and hardbound copies, and tokens for respondents strained budgets
Challenges	Contrasting experiences of research guidance	Some advisers were available and hands-on; other participants lacked adequate guidance
Opportunities	Research-based diligence and preparation for teaching	Research built planning skills, confidence in answering students, and content knowledge
Opportunities	Reflective adjustment of teaching practice	Participants observed students, reflected after each class, and adapted strategies, using interactive approaches with younger students and direct instruction with senior high school learners
Opportunities	Adapting instruction to learner needs and context	Strategies were chosen deliberately, since what works in one class may fail in another

Time, respondents, money, and guidance were the main obstacles. Even so, participants credited research with better preparation, a habit of reflecting after classes, and more deliberate adaptation of instruction to learners.

DISCUSSION

Research as reflection-on-action. The before-and-after accounts of Participants B, C, F, I, and L fit Schön's account of reflection-on-action, in which professionals review an experience afterward and change later thinking and behavior [10], [11]. They also agree with earlier work: pre-service teachers who did classroom-based research during field experiences developed stronger evidence-based decision-making [21], research during teacher preparation can build an inquiry orientation that outlasts the course [22], and reflective practice during practicum supports the confidence and professional development of pre-service English teachers [12]. Reports of fulfillment and recognition (Participants D, E, and J) echo findings that research, though demanding, becomes rewarding once challenges are overcome [8], [23].

Research as obligation, standard, and relationship. Participants A and K treated research as a duty set by DepEd and by law. This matches evidence that policy shapes Filipino teachers' engagement with research [24], that research competence is framed by departmental guidelines [6], and that the PPST list research-related learning as part of professional growth [4]. Participants D and E defined research through systematic procedure, ethics, and credibility, in line with views that rigorous research requires both methodological and ethical competence [25]. The collaborative theme agrees with studies in which groupmates, respondents, instructors, and mentors shaped how pre-service teachers understood research [23] and in which

collaborative approaches built research skills better than working alone [26]. Taken together, the participants hold three views of research at once: as a personal change, an external requirement, and a shared practice. The program's research culture appears to need all three.

Uneven research requirements. Participants G and K experienced different formats, assessments, and scopes. Variation of this kind appears elsewhere, for example where a final-year research subject ended in a poster presentation instead of a thesis defense [27], and classroom-based action research during field study and practice teaching carries requirements that differ from earlier research work [28]. The variation here suggests that students' experience of the research requirement depends on their cohort and course sequence, which is a program-design concern.

Awareness is not application. Participants A and F, working on separate projects, found that familiarity with gender-fair language did not guarantee its use, because materials were not aligned with it, and because English is a second language for many Filipino teachers. Studies of Thai pre-service teachers [29], Philippine basic education teachers [30], and Philippine higher education teachers [31] report the same gap between awareness and practice. For teacher education, the finding suggests that research on a topic does not by itself change materials and classroom habits unless those materials and conditions change as well.

Innovation as purposeful technology use and adaptation. The most frequent pattern in internship accounts was technology tied to a teaching purpose and subject, which is the integration TPACK describes [13], [14]. This extends earlier evidence that TPACK-integrated activities improve pre-service teachers' technology use and contextualized pedagogy [5]. Participants also treated innovation as adapting to power interruptions, modules that did not fit learners, and subjects outside their major. At the same time, limited equipment, connectivity, and student access constrained these practices, consistent with reports that missing ICT resources hinder teaching and learning [32]. Innovation therefore depends on institutional conditions as well as individual effort.

Limitations. The study covers twelve fourth-year BSEd English students from two campuses of one university, most of whom were research leaders or award recipients. Their accounts may therefore be more favorable toward research than those of other students. The researchers were members of the same program, which supported interpretation but may also have shaped it. Findings are meant to describe participants' experiences and to inform similar contexts, not to be generalized statistically.

CONCLUSION AND RECOMMENDATIONS

The experiences in the research related programs changed the way participants thought about and practiced research, and many participants transitioned from fear and pressure to a systematic, evidence-based and appreciative perspective on research, while others felt it was more of an obligation. The programme was seen as providing knowledge that was applicable to practice and research capacity and reflection were seen as supporting innovative teaching in relation to technology in relation to content, and in relation to adaptation for the learners and for the conditions. Time, recruiting respondents, finances and resources, guidance, and infrastructure were also identified as challenges faced by participants. Despite this, their research served to reinforce their preparation, confidence, and reflective practices. To put these achievements into practice, institutional resources, mentorship, exposure to the field and the students' attitude toward research were required.

Based on these findings, the study recommends that:

- Program administrators and research instructors offer adviser-guided research courses across all program pathways, with an annual research colloquium, so that every student completes and presents at least one mentored paper.
- Administrators widen access to research databases, including the PUP iLibrary, and set regular adviser consultation hours, monitoring database use and consultation attendance each semester.

- Administrators and instructors arrange school-based observation in the early years of the program and give research courses dedicated, scheduled research time.
- Research instructors and practicum supervisors require a short end-of-semester reflection in which students describe a classroom problem and how it was addressed.
- Administrators assess classroom equipment, internet connectivity, and students' access to devices within one academic year and review the needs each semester.
- The program provide a research timeline that accounts for practice teaching and internship, and assign an adviser to each research group within the first month of the research course.

Future studies may include students from other campuses, majors, and levels, and may follow participants into their first years of teaching to see whether research-informed practices are sustained.

Ethical Considerations

The study received ethical approval from the relevant University bodies such as the PUP University Research Ethics Committee (UREC). Subjects took part on a voluntary basis and consent was obtained prior to data collection following an explanation of the purpose, scope, risks and benefits of the study. The study adhered to the Data Privacy Act of 2002; data were stored securely with no one else, and data were reported without identifying information. The researchers did not cause physical, emotional and mental harm to either the participants of the study or to any data, and all data were reported as they were, without fabricating or manipulating data.

Conflict of interest. The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

Data Availability

The data consists of the transcript of an interview which includes the perspectives of the participants. Full transcripts are not available to the general public, as the identities of the participants need to be protected and because the consent was given. Excerpts from the reports are anonymised and used in this article to support the findings.

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