Research Competencies of Senior High School Educators in Zamboanga City: Pathways for Continuous Advancement

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ABSTRACT:

Secondary educators are increasingly tasked with mentoring students in research, yet the readiness of teachers outside metropolitan areas remains underexplored. This descriptive-quantitative study evaluated the baseline research competencies of 399 randomly selected public senior high school teachers in the Zamboanga City Division. Data collected via a validated instrument were analyzed using descriptive and inferential statistics. Results indicated that while participants possessed advanced digital information-gathering skills, they exhibited deficits in complex competencies like statistical analysis and methodological design. Neither gender nor baseline education significantly influenced capacity. However, professional development was highly determinative; educators with immersive, international training exhibited significantly superior quantitative and problem-solving skills compared to those restricted to localized seminars. Cultivating a genuine research-pedagogy nexus requires institutional re-engineering. Administrators must replace short-term seminars with sustained, globally aligned capacity-building frameworks to equip educators for modern research-infused curricula.

Keywords: teacher-researchers, research competencies, professional development, basic education, capacity building, quantitative analysis

Introduction

The teaching profession now requires educators to transition from information consumers to knowledge creators, making scholarly inquiry essential to teaching culture (Agud & Ion, 2019). This evolution demands teachers act as reflective practitioners within an inquiry community (Darling-Hammond & Snyder, 2000; Gore & Morrison, 2001; Rodger, 2002). Integrating research equips teachers to implement evidence-based pedagogy (Niemi & Nevgi, 2014), which benefits students by cultivating analytical mindsets and guiding academic trajectories (Seymour et al., 2004).

In the Philippines, recent senior high school (SHS) reforms introduced a research-infused curriculum, while institutional directives emphasize action research as a core professional development metric (Ulla, 2017; Ulla, Barrera, & Acompañado, 2017). Despite these mandates, heavy instructional schedules often force teachers to prioritize teaching over inquiry (Ulla, 2017; Ulla, Barrera, & Acompañado, 2017). Consequently, a disconnect exists: educators must mentor students in complex methodologies, yet many struggle to apply these competencies themselves (Torres, 2018).

As a catalyst for professional development, inquiry empowers educators to diagnose

pedagogical challenges (Cain & Milovic, 2010; Hine, 2013) and is increasingly conceptualized as an intrinsic teacher responsibility (Firth, 2016; Hammersley, 1993). Active research participation cultivates critical reflection on student needs (Cheruvu, 2014; Cochran-Smith, 2005), redefining teachers as reflective, data-driven practitioners (Fueyo & Koorland, 1997). Thus, research-competent teachers can better drive educational reforms and adapt instruction (Razak et al., 2022; Reis-Jorge, 2005).

Executing rigorous research demands methodological design, analytical problem-solving, and scholarly communication skills (Fan, 2022). Theoretical knowledge must pair with the practical capacity to evaluate evidence and formulate pedagogical interventions (Razak et al., 2022). Disseminating findings requires robust communication to clearly articulate complex data to stakeholders (Broeckelman-Post et al., 2023).

However, widespread integration of practitioner-led inquiry is hindered by structural constraints, notably demanding workloads and insufficient resources (Alhassan & Ali, 2020; Ellis & Loughland, 2016; Norasmah & Chia, 2016). A deficit in specialized methodological training further compounds these limitations, leaving educators feeling underprepared for empirical study (Krokfors et al., 2011).

Empirical investigations into teachers' research capacities remain disproportionately concentrated in metropolitan contexts, overlooking the localized competencies of educators in non-metropolitan landscapes. Thus, a knowledge deficit persists regarding the technical readiness of Philippine SHS teachers to deliver a research-infused curriculum. To address this, the present study evaluates the baseline research skills of public SHS teachers in the Zamboanga City Division across five dimensions: information gathering, research methodology, problem-solving, communication, and statistical analysis. By examining how these intersect with demographic and professional variables (gender, educational attainment, and prior research training), this study establishes an empirical foundation to inform targeted, systematic professional development strategies.

Research Objectives

The purpose of this research is to ascertain the extent of research skills among public Senior High Teachers in Zamboanga City Division. This research will specifically:

1. Determine the extent of research skills among Zamboanga City Division Public Senior High School Teachers in terms of:
    a. Skills in Information Gathering,
    b. Knowledge of Research Methodology,
    c. Problem-Solving Capabilities,
    d. Communication Abilities,
    e. Skills in Statistical/Quantitative Analysis
2. Determine the differences in the extent of research skills among Zamboanga City Division Public Senior High School Teachers in terms of skills in information gathering, knowledge of research methodology, problem-solving capabilities, communication abilities, and skills in statistical/quantitative analysis when data are grouped according to:
    a. gender,
    b. educational attainment,
    c. trainings attended related to research

Methods

This descriptive-quantitative, non-experimental study assessed the research competencies of 399 public Senior High School (SHS) teachers in the Zamboanga City Division, selected via simple random sampling from a population of 492. Inclusion was strictly limited to full-time educators currently teaching research subjects. Following institutional ethical approval and written informed consent, participants completed a reliable, adapted 5-point Likert questionnaire under controlled, independent conditions. The instrument recorded demographic variables (gender, educational attainment, and prior research training scope) and evaluated five empirical domains: information gathering, research methodology, problem-solving, communication, and statistical analysis. Data were processed using weighted means to quantify baseline proficiencies,

independent samples t-tests to evaluate gender differences, and One-Way Analysis of Variance (ANOVA) to determine variance across educational attainment and training levels.

Results

Extent of Research Skills Capacity

An evaluation of the participants' research competencies highlighted fluctuating proficiency levels across the five assessed categories. Based on the findings in Table 1, the educators exhibited peak performance in Information Gathering (M = 4.31, Highly Proficient). Within this area, the highest-rated skill was the recognition of diverse information sources, including digital and media platforms (M = 4.76), while reliance on external support like inter-library loans recorded the lowest score (M = 4.00).

The evaluation of Research Methodology Knowledge resulted in a composite "Moderately Proficient" rating (M = 3.96). Here, respondents showed relative competence in performing literature reviews (M = 4.09), contrasting sharply with a noted hesitation toward preparing publication-ready manuscripts (M = 3.75).

Similarly, Problem-Solving Capabilities achieved a "Moderately Proficient" overall mean (M = 4.01). Teachers noted strong capabilities in devising innovative solutions for research inquiries (M = 4.26) but struggled more when assessing the validity of source materials (M = 3.86).

In terms of Communication Abilities, the results also point to a "Moderately Proficient" standard (M = 4.10). While participants expressed high confidence in delivering presentations (M = 4.34), they experienced greater difficulty in articulating overarching research conclusions (M = 3.95).

Lastly, Skills in Statistical and Quantitative Analysis recorded the lowest overall average among the five domains (M = 3.91, Moderately Proficient). Even though the teachers maintained a general curiosity for quantitative research (M = 4.03), they faced practical challenges when deciding on proper statistical tests and comprehending numerical output (both M = 3.78).

Table 1: Evaluated Research Skill Capacities of Senior High School Educators

Domain & Indicator	Weighted Mean	Proficiency Level
I. Information Gathering Proficiency	**4.31**	**Highly Proficient**
1. I recognize that data can be sourced through multiple channels (e.g., digital platforms, visual, audio, and video formats).	4.76	Highly Proficient
2. I understand that a primary source is the original document recording the foundational work of the literature.	4.46	Highly Proficient
3. I understand that a secondary source provides commentary or discussion on original works.	4.30	Highly Proficient
4. I consult foundational resources, such as encyclopedias or dictionaries, to better grasp the terminology related to my subject.	4.22	Highly Proficient
5. I know how to apply search shortcuts, such as truncation or root words, to initiate my inquiries.	4.11	Moderately Proficient
6. I access external facilities beyond my local institutional library, such as inter-library loans.	4.00	Moderately Proficient
7. I recognize the necessity to expand my search parameters with broader keywords if my current topic yields too little information.	4.50	Highly Proficient
8. I pre-plan the specific formats of literature I require, including textbooks, scholarly articles, and academic journals.	4.32	Highly Proficient

Domain & Indicator	Weighted Mean	Proficiency Level
9. I recognize that academic journals undergo more rigorous peer review and editing processes compared to standard magazines.	4.27	Highly Proficient
10. I determine appropriate synonyms, core themes, or keywords to facilitate literature retrieval for my subject.	4.19	Moderately Proficient
II. Research Methodology Comprehension	**3.96**	**Moderately Proficient**
11. I am capable of executing a review of related literature.	4.09	Moderately Proficient
12. I am able to structure an experimental research design.	3.94	Moderately Proficient
13. I am competent in choosing a research instrument.	3.98	Moderately Proficient
14. I am able to seek out a viable research problem.	4.04	Moderately Proficient
15. I possess the skills to construct a research tool/instrument.	3.84	Moderately Proficient
16. I am able to formulate a specific research question.	3.99	Moderately Proficient
17. I have the capacity to draft a research abstract.	4.06	Moderately Proficient
18. I am proficient in gathering survey-based data.	4.06	Moderately Proficient
19. I demonstrate the capacity to organize and plan a study.	3.89	Moderately Proficient
20. I possess the skills to finalize a manuscript for academic publication.	3.75	Moderately Proficient
III. Problem-Solving Competence	**4.01**	**Moderately Proficient**
21. I can conceptualize innovative approaches to resolve an investigative problem.	4.26	Highly Proficient
22. I possess the ability to pinpoint a specific research issue.	4.16	Moderately Proficient
23. I verify the validity of information by cross-referencing external citations provided by the author.	4.04	Moderately Proficient
24. I am capable of clearly defining the boundaries of a research problem.	4.01	Moderately Proficient
25. I am willing to revise my search strategies to locate exact information if initial attempts fail.	3.99	Moderately Proficient
26. I am adept at discovering novel angles to tackle a research question.	3.91	Moderately Proficient

Domain & Indicator	Weighted Mean	Proficiency Level
27. I demonstrate proficiency in analyzing complex problems.	3.96	Moderately Proficient
28. I am capable of validating the factual accuracy of various source contents.	3.86	Moderately Proficient
29. I can intuitively comprehend and unravel a research problem.	3.94	Moderately Proficient
IV. Communication Competence	**4.10**	**Moderately Proficient**
30. I have the ability to deliver presentations self-assuredly.	4.34	Highly Proficient
31. I am adept at conveying the primary intent of my study to others.	4.25	Highly Proficient
32. I am capable of articulating the core objectives behind my research outcomes.	4.12	Moderately Proficient
33. I am competent in clarifying the rationale of my investigation.	4.06	Moderately Proficient
34. I possess the writing skills necessary to document my research discoveries.	4.03	Moderately Proficient
35. I have the ability to synthesize and condense research data.	4.02	Moderately Proficient
36. I am proficient at elaborating on the study's final conclusions.	4.01	Moderately Proficient
37. I am capable of disseminating my findings utilizing the most suitable terminology and language.	4.13	Moderately Proficient
38. I have the capacity to showcase my research outcomes to broader, external audiences.	4.09	Moderately Proficient
39. I experience little difficulty in sharing my study and its corresponding outcomes.	3.95	Moderately Proficient
V. Quantitative and Statistical Expertise	**3.91**	**Moderately Proficient**
40. I experience challenges when operating statistical software or tools.	3.98	Moderately Proficient
41. I possess a strong inclination toward quantitative research methodologies.	4.03	Moderately Proficient
42. I possess the confidence to execute data gathering protocols.	3.96	Moderately Proficient
43. I can determine the most suitable analytical method for my collected dataset.	3.97	Moderately Proficient
44. I am able to construct a research tool that aligns with my specific study requirements.	3.86	Moderately Proficient
45. I am knowledgeable about which specific statistical tests apply to my research design.	3.78	Moderately Proficient

Domain & Indicator	Weighted Mean	Proficiency Level
46. I have the ability to translate and explain the statistical results of my study.	3.78	Moderately Proficient

Legend: 1.00-1.80 (Not Proficient); 1.81-2.60 (Less Proficient); 2.61-3.40 (Proficient); 3.41-4.20 (Moderately Proficient); 4.21-5.00 (Highly Proficient).

Variations in Research Competencies by Sex

The outcomes of the Independent Samples T-test, which contrasts the investigative proficiencies of male and female educators, are outlined in Table 2. Although male teachers demonstrated slightly elevated averages across every measured category (for example, Information Gathering: Male M = 4.34, Female M = 4.30; Communication Abilities: Male M = 4.16, Female M = 4.07), these differences lacked statistical significance. All computed p-values exceeded the 0.05 alpha threshold. As a result, the findings suggest that the overarching research capabilities of public SHS educators are not significantly influenced by their sex.

Table 2: Independent Samples T-test on Research Competencies Grouped by Sex

Skill Domain	Sex	Mean	SD	Observed t	df	p-Value	Interpretation
Statistical/Quantitative Analysis	Male	4.06	.65510	1.904	159	.059	Not Significant
	Female	3.82	.77982				
Information Gathering	Male	4.34	.48794	.445	159	.657	Not Significant
	Female	4.30	.55002				
Problem Solving Capabilities	Male	4.12	.67059	1.290	159	.199	Not Significant
	Female	3.96	.75878				
Communication Abilities	Male	4.16	.63359	.740	159	.461	Not Significant
	Female	4.07	.75274				
Research Methodology Knowledge	Male	4.06	.66600	1.207	159	.229	Not Significant
	Female	3.91	.77087				

Variations in Research Competencies by Academic Qualification

To investigate whether teachers' investigative abilities shifted based on their highest completed degree (Bachelor's, Master's, or Doctorate), a One-Way Analysis of Variance (ANOVA) was applied. Displayed in Table 3, the findings indicate an absence of significant variances across the five evaluated skill sets. For example, the empirical results for Information Gathering ($F(2,158) = 1.685$, $p > .05$) and Research Methodology Knowledge ($F(2,158) = 1.178$, $p > .05$) uphold the null hypothesis. Ultimately, the academic degrees held by the respondents do not play a significant role in altering their overall research capabilities.

Table 3: ANOVA Outcomes for Research Competencies Based on Educational Attainment

Skill Domain	Source of Variation	Sum of Squares	df	Mean Square	F-Obs	p-Value	Interpretation
Statistical/Quantitative Analysis	Between Groups	1.081	2	.541	.975	.379	Not Significant
	Within Group	87.564	158	.554			
	Total	88.645	160				
Information Gathering	Between Groups	.930	2	.475	1.685	.189	Not Significant
	Within Group	43.617	158	.276			
	Total	44.548	160				
Problem Solving Capabilities	Between Groups	1.070	2	.535	1.002	.369	Not Significant
	Within Group	84.300	158	.534			
	Total	85.370	160				
Communication Abilities	Between Groups	.926	2	.463	.912	.404	Not Significant
	Within Group	80.194	158	.508			
	Total	81.120	160				
Research Methodology Knowledge	Between Groups	1.276	2	.638	1.178	.311	Not Significant
	Within Group	85.558	158	.542			
	Total	86.834	160				

Variations in Research Competencies by Scope of Training Seminars

An additional One-Way ANOVA was executed to evaluate how previous research training engagements (classified into local, national, or international scopes) influenced the educators' skill sets. As illustrated in Table 4, the geographical tier of the attended training resulted in statistically significant disparities across every domain. Noticeable differences emerged within Statistical/Quantitative Analysis ($F(2,158) = 6.349$, $p < .05$), Information Gathering ($F(2,158) = 3.348$, $p < .05$), Problem Solving ($F(2,158) = 4.797$, $p < .05$), Communication ($F(2,158) = 7.293$, $p < .05$), and Methodology Knowledge ($F(2,158) = 6.349$, $p < .05$).

Table 4: ANOVA Outcomes for Research Competencies Based on Training Attended

Skill Domain	Source of Variation	Sum of Squares	df	Mean Square	F-Obs	p-Value	Interpretation
Statistical/Quantitative Analysis	Between Groups	6.594	2	3.297	6.349	.002	Significant
	Within Group	82.050	158	.519			
	Total	88.645	160				
Information Gathering	Between Groups	1.811	2	.905	3.348	.038	Significant

Skill Domain	Source of Variation	Sum of Squares	df	Mean Square	F-Obs	p-Value	Interpretation
	Within Group	42.737	158	.270			
	Total	44.548	160				
Problem Solving Capabilities	Between Groups	4.887	2	2.443	4.797	.009	Significant
	Within Group	80.483	158	.509			
	Total	85.370	160				
Communication Abilities	Between Groups	6.856	2	3.428	7.293	.001	Significant
	Within Group	74.264	158	.470			
	Total	81.120	160				
Research Methodology Knowledge	Between Groups	4.240	2	1.120	6.349	.002	Significant
	Within Group	82.594	158	.523			
	Total	86.834	160				

A Scheffé post hoc evaluation was applied to pinpoint the exact origins of these differences. This subsequent analysis indicated that educators restricted to locally-based research training performed significantly poorer in problem-solving ($p = .044$), communication ($p = .009$), and statistical techniques ($p = .006$) in comparison to peers who participated in international research workshops.

Discussion

The baseline assessment reveals a bifurcated trend: educators excel as digital information consumers but exhibit moderate structural proficiency in core components like methodological design, problem-solving, scholarly communication, and quantitative analysis. This operational gap stems from basic education environments that integrate digital access but rarely embed procedural empirical execution. This reflects Torres (2018), who noted friction in translating theoretical knowledge into instructional execution. Technical constraints in experimental modeling confirm that practical empirical design mechanics remain highly challenging for secondary practitioners (Krokfors et al., 2011; Ulla, 2017). Interestingly, teachers' strong interest in quantitative methods, despite technical limitations, extends Alhassan and Ali (2020), demonstrating that deficits stem from unaddressed skill boundaries rather than motivational resistance. This highlights a policy mismatch: state frameworks demand student research outputs, yet mentors require targeted training for empirical competency (Fan, 2022). Consequently, professional development must pivot from superficial information-literacy workshops toward technical methodological coaching.

Demographic and academic modifiers—specifically gender and foundational educational attainment—did not significantly influence research capacity. This equivalence suggests observed operational deficits are universal and systemic, rather than demographically isolated or mitigated merely by holding postgraduate credentials. This universality extends broader literature, confirming that systemic constraints like demanding workloads and missing methodological scaffolding curtail research engagement across the workforce (Alhassan & Ali, 2020; Ellis & Loughland, 2016; Norasmah & Chia, 2016). It reinforces that cultivating a genuine research-pedagogy nexus requires continuous, specialized facilitation transcending initial teacher education or standard graduate coursework (Agud & Ion, 2019; Ulla, 2018). Thus, capacity-building frameworks must be

equitable and universally targeted rather than stratified by academic profiles.

Conversely, the scope of prior research training emerged as a primary determinant of empirical proficiency. International training significantly drove superior problem-solving, communication, and statistical analysis skills compared to localized training. This underscores a qualitative divergence: local seminars often prioritize brief conceptual overviews, whereas immersive international models embed educators within comprehensive methodological frameworks and practical data exercises. This aligns with Reis-Jorge (2005), emphasizing that capable researchers require structured, rigorous exposure over superficial training. It also corresponds with Krokfors et al. (2011), who posited that effective research-based education must ground educators in advanced methodologies. The inadequacy of local training highlights structural flaws in standard in-service programs lacking the depth for publication-ready expertise (Ulla, 2018). Strategically, expanding access to globally aligned, long-term, immersive training certifications is critical. Establishing a sustainable research culture in basic education hinges on systematically re-engineering institutional professional development rather than relying on baseline credentials.

Conclusion

Public senior high school educators possess strong information-gathering skills but face operational ceilings in complex competencies like statistical analysis and methodological design. Neither educational attainment nor gender significantly modulates these capacities, indicating a universal, systemic challenge. Conversely, immersive international research training is a critical catalyst for elevating problem-solving and quantitative proficiencies. These insights necessitate re-engineering institutional support. Administrators must transcend short-term seminars to institutionalize comprehensive faculty development prioritizing technical statistical coaching and manuscript architecture. Fostering a sustainable, data-driven culture requires systemic interventions exposing educators to prolonged, globally aligned capacity-building initiatives rather than superficial compliance exercises. This study is constrained by its cross-sectional, self-reported methodology and contextualization within public institutions of a singular non-metropolitan division, limiting generalizability. Future research should deploy qualitative methodologies to explore the granular structural challenges hindering empirical execution. Extending comparative frameworks to private educational sectors and conducting longitudinal assessments on how sustained research engagement impacts pedagogical performance remain critical imperatives.

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