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Original Article

A Critical Mixed-Methods Analysis of Student-Teachers' Action Research Challenges and Institutional Mediation in Ghanaian Colleges of Education

Benjamin Quarshie[1]*, Akwasi Amponsah[2], Henry Ofosu Ameyaw[3], Anthny - Mensah[3], Mercy Anna Ayi-Kooley Malm[3], Moses Jahkumah Appiah-Quansah[3]

Abstract: Action research is a core component of Ghana's Initial Teacher Education (ITE) framework, designed to foster reflective practice and inquiry-based problem-solving during student-teachers' internships. However, ongoing difficulties in its implementation raise concerns about the adequacy of institutional and supervisory support. This study explores the lived experiences of final-year student-teachers conducting action research in Colleges of Education in Ghana. Using a mixed-methods embedded design, quantitative and qualitative data were collected from 240 student-teachers across 16 colleges. Descriptive statistics and thematic analysis identified key challenges, assessed institutional support structures, and examined coping strategies. Findings indicate major difficulties in problem identification, data analysis, and academic writing, intensified by irregular supervision, limited methodological guidance, logistical constraints, and cognitive-emotional pressures. Nevertheless, most participants reported improved reflective thinking and classroom problem-solving. The study proposes a conceptual framework linking student challenges with institutional support and recommends scaffolded research pedagogy, standardized supervision, and enhanced digital infrastructure to strengthen sustainable research capacity.

Keywords :
Action research; Ghana; Institutional support; Student-teachers; Teacher education.

Author Affiliation:
[1] Department of Creative Arts Education, Mampong Technical College of Education, Ghana
[2] Department of Mathematics and ICT, Mampong Technical College of Education, Ghana
[3] Department of Social Sciences, Abetifi Presbyterian College of Education, Ghana

***Corresponding author(s):**
Benjamin Quarshie, Mampong Technical College of Education, Ghana
bquarshie@mtce.edu.gh

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INTRODUCTION

Action research plays a strategic role in contemporary teacher education by bridging theory and classroom transformation (Manfra, 2019). Internationally, it is recognised for fostering reflective, adaptive practitioner-learners who engage in iterative cycles of inquiry

to improve teaching and learning (Machost & Stains, 2023; Manfra, 2019). Through context-responsive classroom investigation, teacher-researchers generate localised knowledge that supports equitable and learner-centred instruction (Baako & Abroampa, 2024; Cereda, 2025). In Ghana, this orientation is embedded in Initial Teacher Education (ITE) reforms mandating research and action research across Colleges of Education. However, despite strong policy support, the enactment of action research during internships often falls short of reform intentions, particularly regarding research competence and institutional support. National frameworks such as the National Teachers' Standards (NTS) and the Programme for the New Teacher Education Curriculum (PNTEC) emphasise lifelong, evidence-informed professional inquiry to strengthen instructional problem-solving and learning outcomes (Ministry of Education & National Teaching Council, 2017; T-TEL, 2020).

In their final year, student-teachers are required to demonstrate action research competence during internship by designing, implementing, and defending a research project, consistent with Ghana's reflective ITE model (Manfra, 2019; Mills, 2018). At this stage, action research functions both as an assessment requirement and as evidence of readiness to act as reflective practitioner-researchers in authentic classroom settings (Schön, 1983; Zeichner & Noffke, 2001). However, challenges emerge across the research process from problem formulation and methodological design to data analysis and academic writing often constraining the quality of interventions and findings (Cochran-Smith & Lytle, 2009; Kemmis *et al*., 2014). These difficulties are further shaped by institutional conditions, including uneven supervision, large and geographically dispersed internship placements, and research instruction perceived as overly theoretical with limited practical grounding (Manfra, 2019; Mao & Fadri, 2024a; Mao *et al*., 2024b; Annan-Brew & Arhin, 2022; Heissenberger-Lehofer & Krammer, 2021). Limited access to scholarly resources and reduced confidence in academic writing further compound these constraints.

Despite documented structural and pedagogical constraints in action research, little is known about how Ghanaian student-teachers experience and navigate these challenges during internships. Understanding their perspectives is crucial for evaluating action research effectiveness in ITE, especially given its role in improving instructional quality and teacher autonomy (T-TEL, 2020; Ministry of Education & National Teaching Council, 2017). This mixed-methods study examines challenges faced, perceptions of institutional support, and strategies to enhance research competence, providing insights to inform pedagogical and institutional interventions in Ghanaian Colleges of Education.

THEORETICAL SUPPORT

Theoretical Framework

This study is grounded in Reflective Practice Theory and Constructivist Learning Theory, selected not for their general relevance to teacher education but for their direct explanatory power in addressing the study's research questions on student-teachers' challenges, institutional mediation, and competence development in action research during internship. These frameworks collectively, provide an analytical lens for examining how

student-teachers interpret classroom problems, engage with inquiry processes, and respond to supervisory and institutional conditions in authentic school contexts.

Reflective Practice Theory (RPT) (Machost & Stains, 2023), frames professional learning as an iterative process of reflection-in-action and reflection-on-action. In this study, RPT guides the analysis of how student-teachers identify classroom problems, make methodological decisions, and evaluate interventions under real-time constraints. Rather than treating reflection as a generic skill, RPT explains variations in problem formulation, decision-making, and documentation quality, highlighting how reflective practitioners interrogate experience and use evidence to improve instruction (Machost & Stains, 2023). This approach develops professional judgment and adaptive competence, particularly for context-responsive teaching, aligning with Ghana's teacher education reforms that promote autonomous, evidence-informed problem-solvers (Ministry of Education & National Teaching Council, 2017; T-TEL, 2020). Action research operationalises RPT by positioning student-teachers as practitioner-researchers who generate context-specific knowledge, while also revealing how gaps in reflective scaffolding or supervision can hinder the translation of methodological knowledge into practice.

Constructivist Learning Theory, especially Vygotsky's socio-cultural perspective, emphasizes learning through active engagement, collaboration, and interaction with more knowledgeable others (Vygotsky, 1978). In this study, it informs the analysis of institutional support supervision, mentoring, and collaborative research spaces as mediating factors shaping student-teachers' research competence. Action research is conceptualized as situated learning, where competence develops through guided participation rather than independent knowledge acquisition. While Reflective Practice Theory explains cognitive engagement in inquiry, Constructivist Learning Theory clarifies how institutional conditions, including supervision quality, feedback, and resource access, influence students' ability to conduct meaningful action research. Together, the theories provide a coherent framework linking individual reflective processes with structurally mediated learning opportunities, guiding the study's design, analysis, and interpretation.

Conceptual Framework

This study conceptualises student-teachers' action research competence as an outcome shaped by the interplay of three constructs: action research challenges, institutional support, and intervention strategies. Competence is defined as the ability to identify context-specific classroom problems, apply appropriate methods, analyse data systematically, and communicate findings in line with academic and professional standards (Schön, 1983; Zeichner & Noffke, 2001). The challenges construct captures cognitive, technical, and contextual constraints such as problem formulation, methodological alignment, data analysis, and academic writing difficulties which can either trigger or suppress reflective engagement depending on institutional support (Burns, 2010; Stringer, 2014). Evidence from Ghana shows persistent difficulties during off-campus teaching, particularly in research design and data analysis, often exacerbated by limited practical exposure, weak academic writing, and low-resource school contexts with inadequate materials, poor digital connectivity, and large class sizes (Bour *et al*., 2025; Mensah *et al*.,

2024; Annan-Brew & Arhin, 2022). These challenges are escalated in low-resource school contexts, where inadequate teaching materials, limited digital connectivity, and large class sizes constrain structured inquiry (Dramani *et al*., 2022; Quarshie *et al*., 2022).

Institutional support systems moderate how student-teachers experience and respond to action research challenges, encompassing supervision quality, feedback, mentoring, and access to academic and technological resources (Zeichner, 2010; Zhukova, 2018; Diab & Green, 2024). In many Ghanaian Colleges of Education, large, dispersed cohorts and limited staffing constrain personalised guidance, so consistent, scaffolded support reframes challenges as learning opportunities, whereas fragmented support reinforces barriers to competence. Intervention strategies such as structured supervisory preparation, mentorship, contextualised research toolkits, and progressive research portfolios serve to strengthen institutional support and reduce research challenges over time, improving inquiry engagement and final-year research quality (Diab & Green, 2024). As illustrated in Figure 1, action research challenges directly influence competence, institutional support moderates this effect, and intervention strategies enhance institutional mediation, framing research competence as a relational outcome shaped by reflective engagement, social mediation, and intentional pedagogical investment..

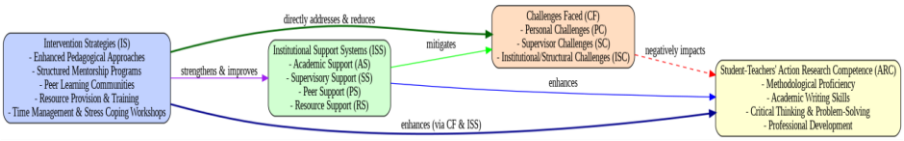

Figure 1. Determinants of Student-Teacher Action Research Competence

METHOD

This study used an embedded mixed-methods design (Heissenberger-Lehofer & Krammer, 2021) to examine student-teachers' action research experiences during internships (Green *et al*., 2015). Quantitative data captured the distribution and intensity of challenges, while embedded qualitative data explained how and why these challenges were experienced within specific institutional and school contexts (Creswell & Plano Clark, 2022; Heissenberger-Lehofer & Krammer, 2021; Green *et al*., 2015). Both strands were implemented concurrently, with qualitative insights informing the interpretation of quantitative trends, contextualising patterns, clarifying outliers, and explaining variations across institutions and geographical settings.

T This integration aligns with the study's focus on linking structural conditions to student-teachers' lived research experiences. Embedded designs suit Ghanaian teacher education, where pedagogical practice and professional development require multi-layered analysis (Salifu *et al*., 2025; Quarshie *et al*., 2022). The target population comprised Level 400 student-teachers from 46 public Colleges of Education who had completed research methodology courses and conducted action research during internships. From an estimated 1,380 students, 240 valid responses were obtained from 16 colleges across urban, peri-urban, and rural zones. Voluntary participation introduces potential self-selection bias, as colleges with stronger research cultures may have been more likely to engage. Thus, findings are interpreted as analytically rather than statistically representative, with the

sample sufficient for identifying patterns and explanatory comparisons consistent with mixed-methods thresholds (Green *et al.*, 2015).

Data were collected using a blended qualitative-quantitative survey administered via Google Forms to maximise accessibility, cost-efficiency, and geographic coverage. The instrument integrated structured itemsincluding Likert scales, rankings, and categorical measures with open-ended prompts designed to elicit in-depth reflective accounts of challenges encountered, supervisory experiences, and coping strategies during internships. Distribution was facilitated through Student Representative Council networks, ensuring broad institutional representation while minimising disruption to ongoing academic activities. Data collection occurred between August and October 2025, aligning with student-teachers' active internship engagement, thereby capturing contemporaneous experiences. To enhance analytical transparency, response trends were visualised using a Matplotlib-generated area chart (Figure 2), highlighting temporal patterns such as participation peaks following examinations and early-respondent influence effects. These trends informed the integration of qualitative insights with quantitative distributions, strengthening the interpretive validity of the study's findings.

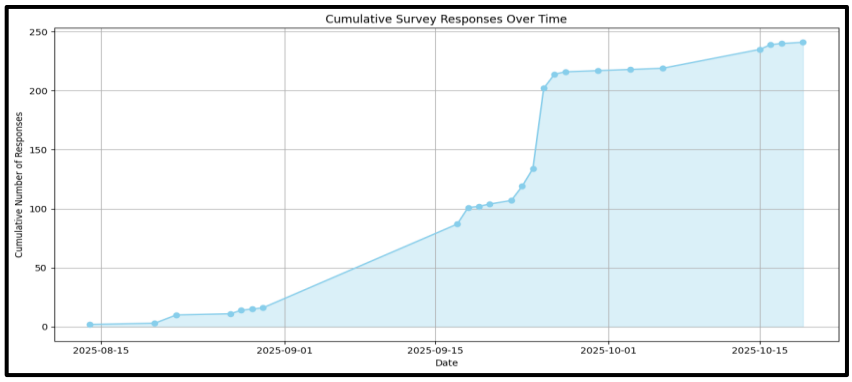

Figure 2: A Matplotlib-generated Area Chart showing cumulative survey responses received and participation across the data collection window

Ethical protocols followed established educational research standards, with voluntary participation, informed consent, anonymity via coded identifiers, and aggregate reporting of sensitive reflections (BERA, 2018). Data analysis combined iterative and integrative cycles guided by the theoretical framework and research questions. AI-assisted coding supported initial processing (Cordeiro *et al.*, 2025), while quantitative data were analysed descriptively in Excel and Google Colab (pandas, matplotlib, seaborn) to identify patterns across gender, region, institution, and challenge categories (Quarshie *et al.*, 2025). Qualitative responses were analysed thematically to explain research design difficulties, resource constraints, supervisory interactions, and socio-emotional aspects of novice teacher engagement (Quarshie *et al.*, 2025; Mao *et al.*, 2024b). Integration occurred at interpretation, with qualitative themes contextualising quantitative distributions to reveal how institutional conditions shaped persistent challenges. A deductive–inductive logic ensured emergent patterns were examined against existing literature while preserving participants' reflective accounts (Creswell & Plano Clark, 2022). Figure 3 illustrates the methodological workflow.

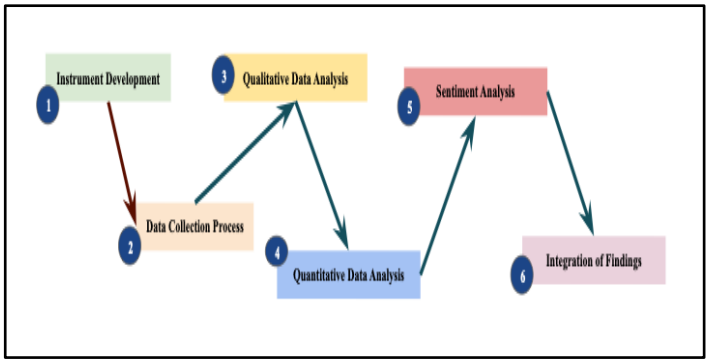

Figure 3. Visualisation of the methodological process

Figure 3 visualises the sequential mixed-methods workflow adopted in the study. The process begins with instrument development, followed by the data collection phase. Quantitative data are first analysed to identify general patterns and trends, which then inform the subsequent qualitative data analysis. The qualitative phase provides deeper interpretation and contextual understanding of the quantitative findings. Finally, the results from both strands are integrated to generate comprehensive and triangulated conclusions, ensuring a coherent and systematic interpretation of the study's findings.

RESULT AND DISCUSSION

Overview of Participant Distribution and Institutional Engagement

A total of 240 valid responses were obtained from student-teachers across 16 Colleges of Education in Ghana, representing diverse institutional contexts and geographical zones. Participation rates varied considerably, highlighting uneven levels of engagement across institutions. The highest number of responses emerged from a female-only college (Ranked 1), which contributed 32.5% of female respondents, while the second-ranked institution, predominantly male, produced 25% of male respondents (Ranked 2). Conversely, seven institutions recorded only a single respondent each, warranting analytical caution when interpreting findings from those colleges due to limited statistical power. The visualisation in Figure 4 provides details on the demography of participation across the colleges based on rank (*1-16*).

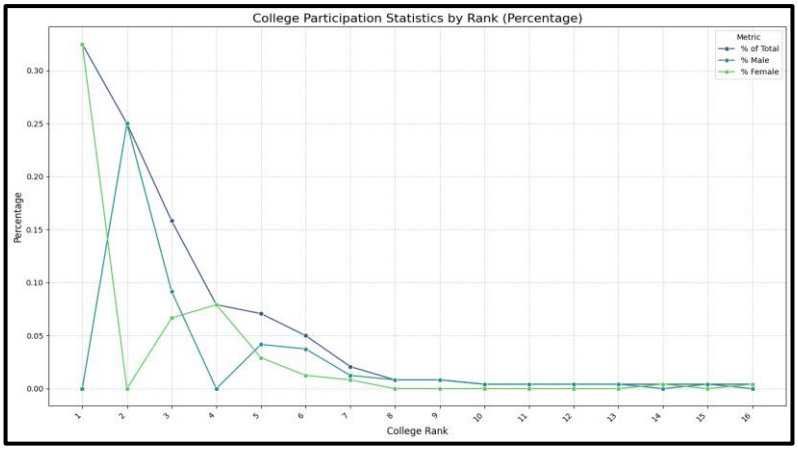

Figure 4. Line Plot Showing percentage gender distribution of participation ranked based highest responses from the 16 College that participated

The dataset reflects a broadly balanced gender composition, with 127 female and 113 male respondents, supporting analysis of gendered patterns in action research, particularly supervision and access to support. This balance is important given evidence that gender dynamics in Ghanaian teacher education shape mentoring opportunities and professional identity formation (Ananga, 2021). Representation across rural, peri-urban, and urban Colleges of Education situates the findings within diverse institutional contexts characterised by uneven resourcing and variable instructional support during internship (Ananga, 2021; T-TEL, 2020; Ministry of Education & National Teaching Council, 2017). Differences in digital access, supervision frequency, and academic resources therefore frame interpretation of the findings, including blended learning challenges encountered during internship (Quarshie *et al*., 2022; Bour *et al*., 2025).

Action Research Support and Impact from Student-Teachers' Perspective

Findings indicate that action research is an established element of professional learning in Ghana's Colleges of Education, though pedagogical support varies considerably across institutions. Analysis of 240 responses identified common instructional approaches, including individual assignments for problem identification (14.53%), group project-based learning for research question development (14.19%), and lecturer-guided proposal writing (9.51%), consistent with practice-based and constructivist learning principles (Dampson, 2021; Salifu *et al*., 2025). However, reliance on lecture-only (6.82%) and predominantly theoretical instruction (4.70%) persists, reinforcing earlier evidence that research methods courses remain theory-heavy with limited pre-internship practice (Benneh & Amponsah, 2018; Dramani *et al*., 2022). Figure 5 illustrates the uneven pedagogical emphasis across the colleges.

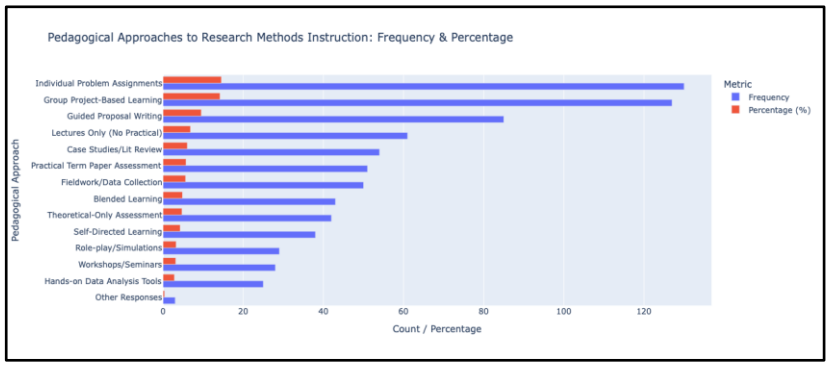

Figure 5. Students' view of Pedagogical Approaches for Teaching Research Methods Across Colleges

Innovative practices such as role-play, mock defences, case study review, and hands-on data analysis were reported at low levels (2.80% – 4.00%), indicating limited uptake of intensive, practice-oriented and technology-supported approaches. Minimal use of digital analytical tools (2.80%) reflects persistent ICT constraints across urban and rural Colleges of Education (Baako & Abroampa, 2024), despite the importance of operationalising research processes in real classroom contexts. Institutional orientation emerged as a key support mechanism. Most Colleges provided orientation through institutional and

supervisory structures, with ten colleges reporting 90% or higher coverage and all institutions exceeding 60%. Figure 6 highlights widespread recognition of student preparation as foundational to national efforts to strengthen action research capacity.

Supervisor orientation varied widely across colleges, from 0.0% (College 13) to 100% (Colleges 9–16), though high percentages often corresponded with low response counts, limiting reliability. Even higher-performing colleges showed substantial variation, e.g., Colleges 1 and 5 reported 85.9% and 64.7%, indicating inconsistent implementation rather than uniform system-wide practice. While institutional climate and leadership may influence novice teacher-researchers' engagement (Diab & Green, 2024; Zhukova, 2018), these data do not allow definitive attribution. Greater fluctuations in supervisory orientation at colleges with higher response volumes may reflect logistical pressures of supervising large, dispersed cohorts, but this remains inferential. Overall, the findings highlight uneven supervisory support and underscore the need for institution-level investigation and targeted administrative measures to improve consistency.

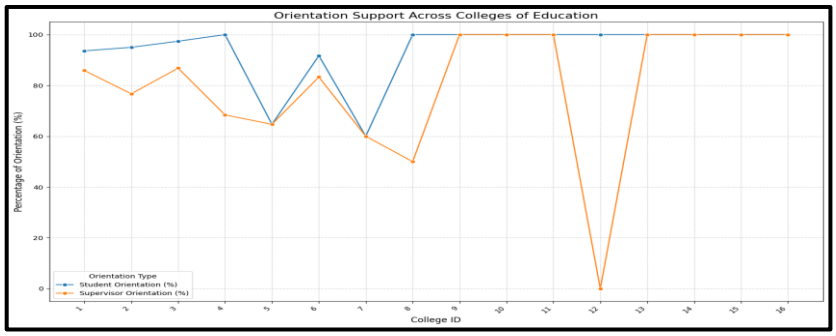

Figure 6. Line plot visualisation of Orientation Support for Action Research Across Colleges of Education

The findings indicate a systemic challenge in which misalignment between student preparation and supervisor orientation weakens coherence between policy, pedagogy, and field implementation. Qualitative accounts point to inconsistencies in supervisory expectations, feedback pacing, and interpretive guidance, particularly where supervisors lack structured institutional orientation. Figure 6 illustrates this uneven institutional scaffolding, reinforcing the conclusion that Colleges play a decisive role in shaping research readiness and the coherence of student-teachers' action research experiences.

Effectiveness/Impact of support systems

Notwithstanding the pedagogical disparities, student-teachers largely perceived action research as positively shaping their professional identity. Half of the respondents (50.0%) reported improved identification of classroom challenges, 40.0% linked it to more learner-centred instruction, and 35.0% to enhanced reflection and problem-solving. These outcomes align with evidence that action research develops reflective practitioners through inquiry cycles (Amenabar & Pontillas, 2024) and with Ghana's ITE reforms promoting praxis-oriented professional autonomy (Ministry of Education & National Teaching Council, 2017; T-TEL, 2020). Stronger integration of professional learning community principles in supervision may further amplify these benefits (Dampson, 2021). Figure 7

shows that, despite contextual and supervisory constraints, action research functioned as a catalyst for professional growth, including broader teaching strategies (30.0%) and improved classroom management (20.0%).

Figure 7: Summary of Reported Impact of Action Research on Teaching Practice

In terms of age correlations establishing the views on the impact the action research process had on their teaching experiences, student-teachers below age 20 expressed that the action research practice has no positive impact on their teaching experience (Figure 8). For such positions to be much clear, there needs further qualitative inquiry to unearth further insights. However, this finding also creates the impression that the younger student-teachers lack advanced knowledge of how research competencies could impact their lifelong teacher professionalism.

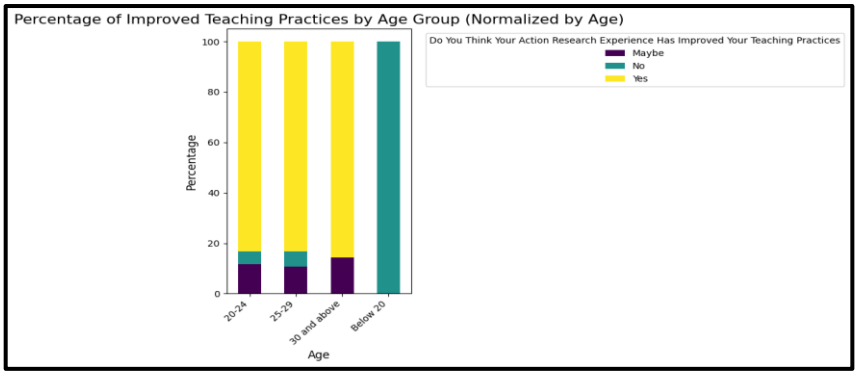

Figure 8. Age Group distribution of Student-teachers' perception about the impaction of action research on their teaching experiences

Student-teachers' ratings of institutional support systems reveal clear preferences regarding what most effectively enabled their engagement with action research. As shown in Figure 9, mentorship and supervision were ranked most highly, with 180 respondents (75%) rating this support as *very effective*. Research workshops followed closely, receiving *very effective* ratings from 168 respondents (70%), while peer collaboration was similarly valued, with 162 respondents (67.5%) reporting it as *very effective*.

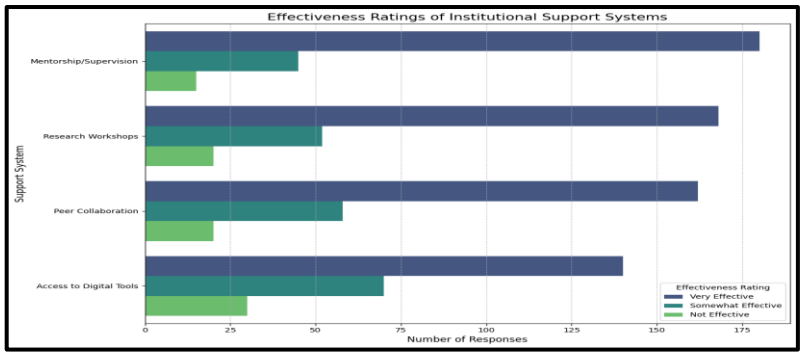

Figure 9. Student-Teachers' ratings of effectiveness of support systems for their action research

Although these high ratings underscore the perceived importance of structured and relational support mechanisms, reliance on aggregate percentages may obscure variations in effectiveness across institutions, internship contexts, and levels of supervisory access. Moreover, self-reported ratings are susceptible to response bias, particularly where student-teachers may equate frequency of interaction with perceived effectiveness. These findings enforce the importance of collaborative inquiry structures in strengthening novice teachers' research capacity and collective problem-solving (Mao & Fadri, 2024a; Baydarova, 2024; Diab & Green, 2024; Zhukova, 2018). However, perceived differences in the effectiveness of support mechanisms appear to reflect variations in accessibility, consistency, and mode of delivery rather than inherent pedagogical superiority. Mentorship and supervision may attract higher ratings because they offer direct, personalised guidance at critical stages of the research process, while workshops and peer collaboration are often uneven in intensity and follow-up. In the Ghanaian context, peer collaboration becomes especially salient during dispersed internships with limited supervisory contact, relying heavily on informal student networks.

Access to digital tools received weaker endorsement, with 58.3% rating it as very effective and the highest number of not effective responses (n = 30). Qualitative data attribute this to ICT disparities, especially in rural placements marked by unstable internet, limited device access, and weak infrastructure, which constrained engagement with digital literature, analysis tools, and submission platforms. This pattern aligns with evidence that digital inequity remains a persistent barrier to teacher capacity development in Ghana (Dramani *et al*., 2022; Singun, 2025). While student-teachers valued action research for improving practice, meaningful engagement depended on coherent institutional support. Strong supervision, orientation, mentoring, and peer learning were associated with higher confidence and smoother progression, whereas weak digital and supervisory support contributed to delays, design challenges, and reduced reflection.

Supervisor-Related Challenges

Supervision strongly shaped student-teachers' action research experiences, reinforcing documented gaps between student-teachers and mentors (Kuyini *et al*., 2022; Abudulai, 2021). Figure 10 reveals a pronounced gender imbalance in supervision, with most student-teachers, both female (n = 107) and male (n = 87), supervised by male lecturers, while supervision by female lecturers was limited (female students n = 19; male

students n = 25). This pattern reflects entrenched gender hierarchies in Ghanaian teacher education, where supervisory roles remain male-dominated (Beg *et al.*, 2021). Beyond representation, such imbalance may constrain access to gender-responsive mentorship and limit supportive spaces for diverse academic identities within teacher preparation.

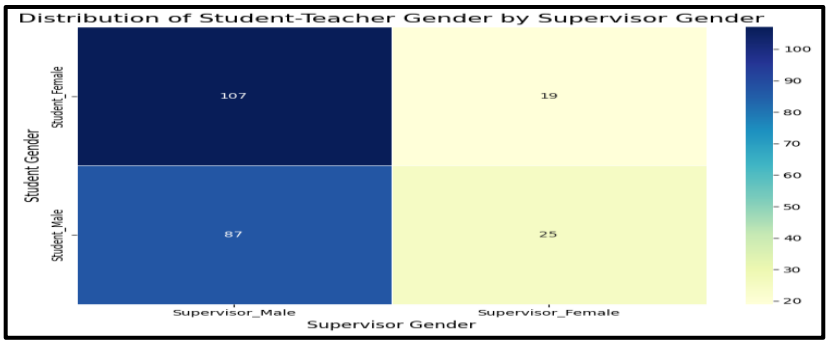

Figure 10. Heatmap of Student-Teacher Gender by Supervisor Gender distribution

Supervisory Engagement/ Administrative Cultures and Outdated Workflows

A major contributor to supervisory difficulty was the persistence of paper-based academic cultures in Colleges of Education. As illustrated in Figure 11, when asked through the survey, 95 of 240 (39%) respondents reported supervisors insisting that all draft chapters be printed and reprinted with each revision. This requirement generated additional pressures, including the financial burden of regular printing, the time spent accessing scarce printing facilities, and the physical demands of repeatedly travelling from placement schools to college campuses. For student-teachers posted in rural or resource-constrained communities, these demands transformed supervision from a scholarly process into a strenuous economic and logistical undertaking.

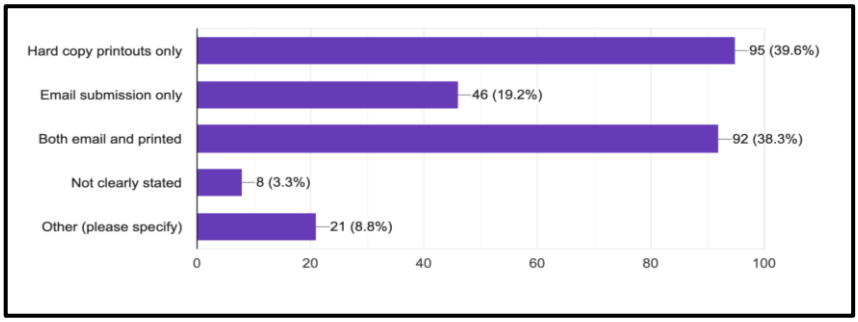

Figure 11. Supervisor' preferred channel for receiving draft chapters from students

Figure 11 indicates that 46% of respondents experienced email-only submission, aligning with NTS expectations for ICT use. However, delays and unclear feedback show that digital submission alone does not enhance supervision quality. Effectiveness depended more on institutional factors such as workload, feedback timelines, clear expectations, and accountability than on submission mode (Ministry of Education & National Teaching Council, 2017; T-TEL, 2020). Persistent paper-based practices therefore reflect structural constraints. Uneven ICT integration and limited standardisation produced inconsistent supervision, suggesting that without reforms in workload management, digital feedback

systems, and supervisor capacity, action research supervision risks remaining administrative rather than developmental.

Reports of Supervisory Misconduct, Power Abuse and Logistical Burdens

Figure 12 shows that the majority of student-teachers, both male and female, reported no supervisor-related challenges, suggesting generally effective professional support by college lecturers. This reflects a positive supervisory culture that supports the development of action research competencies. However, some accounts revealed a more complex reality shaped by logistical pressures and isolated cases of professional misconduct. Students cited repeated printing, physical submissions, and long-distance travel, which delayed feedback and reduced supervision to procedural exchanges rather than reflective inquiry. The figure also indicates that male student-teachers reported more supervisory challenges than females, except in cases of sexual harassment, pointing to gendered dynamics in supervisory interactions. Although the experience was largely positive, these challenges revealed structural weaknesses that could undermine the developmental goals of action research supervision and constitute impacts that must be addressed.

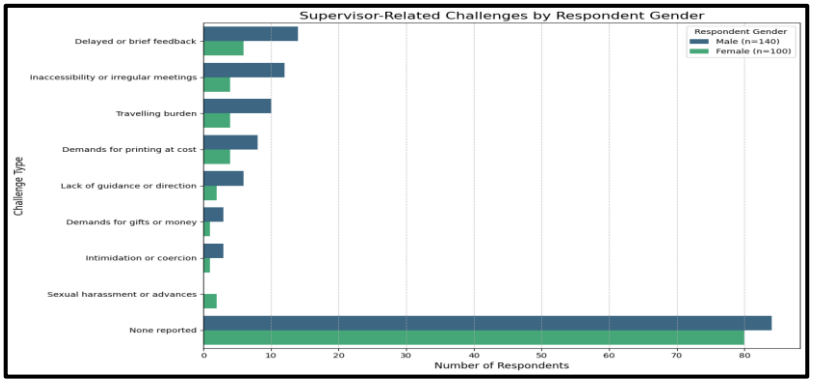

Figure 12. Supervisor-related challenges experienced by student-teachers in their action research process

A small but ethically significant subset of responses reported supervisory misconduct, including demands for money or gifts and inappropriate or coercive conduct. One student-teacher stated, "I was asked to pay money to receive corrections," but refrained from reporting for fear that "he may not accept my project work." A female respondent who reported sexual harassment (Figure 12) explained that she could not formally complain because the supervisor was "a person with a high reputation." These accounts illustrate how supervisory power can be abused to undermine student autonomy, emotional safety, and academic progression, with fear of retaliation, delayed feedback, or compromised graduation silencing affected students. Such dynamics mirror patterns documented in hierarchical academic cultures where institutional power asymmetries inhibit reporting and accountability in cases of sexual misconduct (Koss *et al*., 2014).

Within Ghana's ITE reforms, these findings raise serious concerns because supervision is expected to model ethical professionalism and nurture reflective teacher identities (Amakyi & Mensah, 2014). The coexistence of logistical pressures and reported misconduct exposes structural weaknesses in the governance of action research

supervision. Studies on academic integrity and misconduct management demonstrate that when institutions lack clearly articulated supervisory codes, confidential reporting channels, and transparent enforcement mechanisms, unethical practices persist and become normalised within academic systems (Gamage *et al*., 2023). Although many supervisors demonstrated professional integrity, even isolated cases threaten student well-being, academic integrity, and trust in the system. Addressing these risks requires formalised supervisory guidelines, protected reporting pathways, and enforceable accountability structures aligned with international ethical standards (Koss *et al*., 2014; Gamage *et al*., 2023), to ensure supervision remains developmental, equitable, and ethically grounded.

Positive Supervision Experiences

Regardless of the challenges identified, many student-teachers reported positive supervisory experiences that meaningfully supported their development as practitioner-researchers. These accounts align with mentoring and dialogic learning principles, where constructive academic engagement strengthens confidence and professional direction (Cajkler & Wood, 2016; Ye *et al*., 2025). As shown in Figure 13, supervisors were described as providing timely, constructive feedback, directing students to relevant literature, and encouraging deeper analytical engagement. One student observed that a supervisor "gave references to books and articles that helped my study," underscoring the role of supervision in expanding academic horizons. Others emphasised motivational and emotional support, noting that "My supervisor was supportive and encouraging throughout," highlighting the relational dimension of supervision. Such practices foster resilience, perseverance, and academic identity formation among novice researchers (Cajkler & Wood, 2016; Ye *et al*., 2025). These exemplars warrant recognition and strategic leveraging to strengthen supervisory practice across institutions.

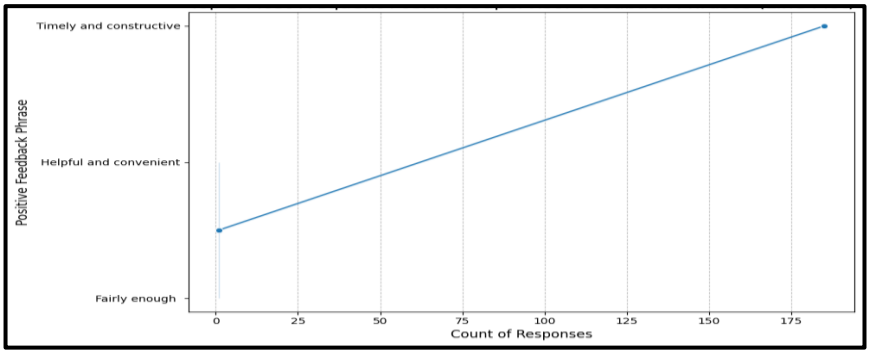

Figure 13. Most frequent positive supervisor feedback phrases

These accounts affirm that supervision, when enacted as scaffolded professional dialogue rather than transactional oversight, strengthens student-teachers' academic writing, methodological judgement, and reflective capacity. This accords with reflective practice theory, which locates professional learning in collaborative inquiry and feedback (Machost & Stains, 2023). Within Ghana's ITE reforms, such supervision demonstrates how pedagogically grounded engagement can deepen evidence-based practice and build confidence among emerging teacher-researchers. The findings reveal a mixed supervisory

landscape including, dialogic and consistent support enabled action research to function as a developmental tool, while logistical constraints, uneven supervisory capacity, workload pressures, and reported misconduct diminished its transformative potential (Baydarova, 2024). Strengthening supervisory systems through clearer standards, modernised processes, and robust ethical accountability remains essential for realising the developmental aims of action research in Ghana.

Personal Challenges

Beyond the supervisor-related challenges, student-teachers also encountered a wide range of personal, academic, and emotional difficulties that shaped their engagement with action research during internship. These challenges were predominantly methodological and cognitive rather than social or financial, indicating that many of the barriers arose from the core processes of designing, implementing, and analysing action research. Figure 14 shows that student-teachers' challenges were concentrated in core research tasks, particularly problem identification (79), balancing research with teaching (69), data analysis (64), and literature review (62), alongside limited methodological understanding (53), time management difficulties (48), weak research question formulation (45), and writing anxiety (39).

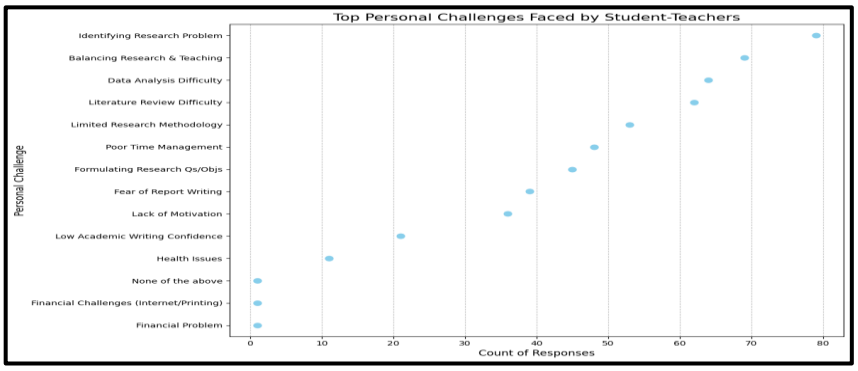

Figure 14: Personal challenges faced by student-teacher during the action research process

Fewer respondents cited low motivation, health, or financial constraints, indicating that difficulties stem mainly from conceptualising and executing action research rather than personal factors. This pattern aligns with evidence that theory-heavy research training leaves novice practitioner-researchers underprepared for applied inquiry (Diab & Green, 2024; Annan-Brew & Arhin, 2022; Zhukova, 2018). The findings underscore the need for practice-oriented preparation through scaffolded micro-inquiries, explicit modelling of data analysis, and guided literature synthesis (Al-Thani & Ahmad, 2025; Getachew, 2025), supported by targeted assistance in planning, academic writing, and equitable digital access (Zeichner, 2010; Sachs, 2015; Liu, 2021).

Student-Teachers' Coping Strategies to Personal Challenges

The survey explored student-teachers' coping strategies in relation to the NTS lifelong learning competencies, revealing interpersonal, intrapersonal, and resource-based approaches (Figure 15). Peer collaboration emerged as the most prevalent strategy,

facilitating academic support, resource sharing, and collective problem-solving, consistent with evidence that learning communities reduce academic stress (Dampson, 2021; Hong & Yang, 2025). Intrapersonal strategies, particularly self-motivation, resilience, and perseverance, reflected internal capacities used to sustain engagement amid methodological and logistical constraints (Hong & Yang, 2025). Resource-based strategies, including consulting journals, borrowing laptops, seeking financial support, and additional independent study, were less common. The presence of "None" responses indicates a small group with limited coping capacity or minimal challenges, underscoring the need for targeted academic and psychosocial support.

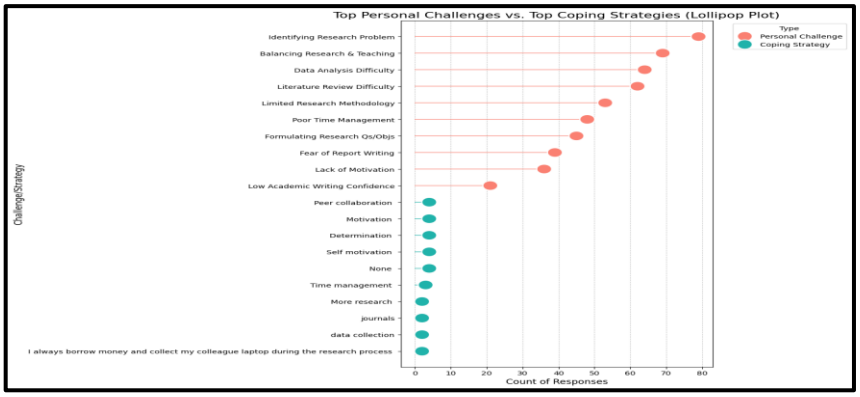

Figure 15: Top Personal Challenges vs. Top Coping Strategies of Student-Teachers

A comparative frequency analysis showed that the most common challenges problem identification (34), balancing teaching and research (26), and data analysis (22) were mainly addressed through consulting supervisors (52), peers (30), and online resources (29). The higher frequency of coping strategies indicates that student-teachers often combined multiple responses to manage a single challenge. Personal academic difficulties and supervisory constraints frequently intersected, as limited guidance intensified problem identification and irregular meetings worsened time management. This pattern shows that systemic supervisory inefficiencies amplify individual challenges, highlighting the need for integrated interventions that strengthen institutional support while building student-teachers' research competence (Zeichner, 2010).

Intervention Framework: An Integrated Conceptual Model for Strengthening Action Research Competence (ARC)

The integrated model (Figure 16) demonstrates how institutional, supervisory, and individual factors interact to shape student-teachers' Action Research Competence (ARC). Institutional constraints, including limited ICT infrastructure, scarce academic resources, and inconsistent orientation, weaken research readiness (Singun, 2025; Baako & Abroampa, 2024; Quarshie *et al.*, 2022). Supervisory challenges such as irregular feedback, unclear expectations, and cumbersome submission processes undermine methodological confidence, while individual limitations in research skills, self-efficacy, and time management further compound these pressures. Challenges Faced (CF) therefore mediate ARC, whereas Intervention Strategies (IS) function to reduce constraints and

strengthen enabling conditions. Institutional investments in digital access and structured orientation, supervisory interventions focused on mentorship preparation and accountability, and individual-level support through skills development and stress management collectively enhance research competence and readiness for inquiry-based practice (Badawy *et al*., 2024; Baydarova, 2024; Sinsay-Villanueva *et al*., 2025).

The model demonstrates that strengthening Action Research Competence (ARC) requires integrated, multi-level reform rather than isolated interventions. Consistent with ecology-of-learning perspectives, ARC emerges from interactions among institutional structures, supervisory culture, and individual agency. Challenges Faced (CF) constrain competence, while Intervention Strategies (IS) operate across levels to reduce barriers, reinforce enabling conditions, and enhance ARC. The framework therefore locates gaps in competence within systemic dynamics rather than individual deficit. Practically, it provides a policy-relevant blueprint for Ghana's teacher education system, indicating that infrastructure development, supervisory reform, and student capacity building must occur concurrently. The model also offers direction for Colleges of Education, affiliate universities, and regulatory bodies, including the National Teaching Council (NTC) and Ghana Tertiary Education Commission (GTEC), in designing coherent action research policies and programmes. Future studies can validate and refine the model through structural equation modelling, path analysis, and longitudinal designs examining how sustained interventions shape research culture and inquiry practices.

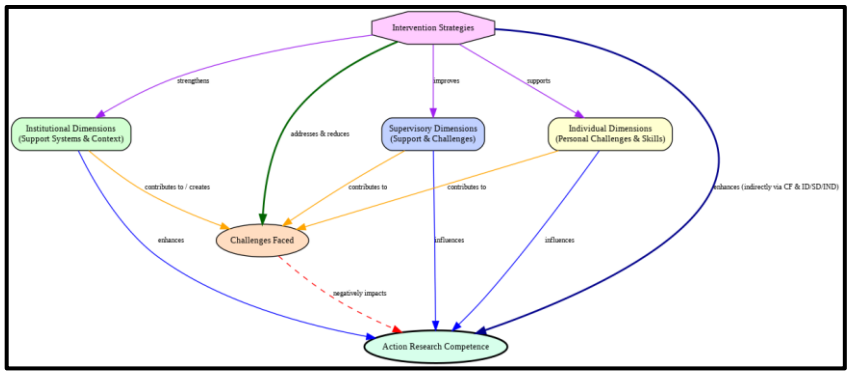

Figure 16: An Integrated Conceptual Model for Strengthening Action Research Competence (ARC) in Colleges of Education

Impication for Policy and Interventvention

The findings underscore the need for integrated, multi-level reforms to strengthen action research in Ghana's ITE system. Nationally, the GTEC should standardise digital submissions, feedback timelines, research methods, and promote gender diversity in supervision. Universities must align research instruction with supervision and field-based inquiry through harmonised protocols and capacity-building initiatives. Colleges of Education should strengthen ICT infrastructure, database access, peer-support mechanisms, and ethical supervisory monitoring, supported by practice-oriented professional development for lecturers. At the individual level, student-teachers require improved resilience, time management, collaborative learning, and early exposure to

digital research tools. Addressing systemic constraints alongside student capacity is essential to maximise the developmental impact of action research

CONCLUSION

This study affirms the centrality of action research in Ghana's ITE, revealing persistent methodological, supervisory, and institutional constraints that shape student-teachers' engagement, particularly in problem identification, data analysis, literature review, and balancing research with teaching. Nevertheless, interns demonstrated resilience through peer collaboration, self-directed learning, and adaptive resourcefulness, highlighting a foundation for cultivating inquiry-based teacher development. Strengthening practice-oriented research instruction, structured supervision, mentorship, and reliable ICT infrastructure can foster continuous, progressive skill acquisition across coursework and practicum. While the study's 240-participant sample, uneven institutional representation, self-reported data, and cross-sectional design limit generalisability, the findings offer critical insights into factors influencing research competence. Future longitudinal, mixed-methods investigations with broader institutional coverage are needed to elucidate how action research promotes reflective, evidence-informed teaching within Ghana's ITE reforms.

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