

Preservice teachers' challenges of conducting research during distance learning amidst the COVID-19 pandemic

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Abstract

The COVID-19 pandemic has necessitated a shift to remote education, creating obstacles for preservice teachers in their research pursuits. This study examines the challenges preservice teachers face when conducting research during distance learning amidst the COVID-19 pandemic. Purposively selected preservice teachers from an institution in northern Philippines were interviewed, revealing challenges related to group dynamics, time disparities, technical dilemmas, and psychosocial struggles. These challenges impede effective collaboration, resource access, and motivation. The findings emphasize the necessity of targeted support programs, enhanced internet connectivity, accessible literature, and clear communication strategies to enhance the research experiences of preservice teachers. Addressing these challenges can improve research practices within distance learning environments.

Keywords: distance learning, preservice teachers, research challenges, remote education, COVID-19 pandemic

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1. Introduction

The repercussions of the COVID-19 pandemic impacted a considerable strain on the spheres of economy, health, politics, and even education was not an exemption (Bai et al., 2020). As a result, affected countries have made strides in shifting from traditional face-to-face learning to distance learning formats in educational institutions (Khan & Abid, 2021; Pręgoska et al., 2021; Stewart & Lowenthal, 2021). This sudden shift has posed significant difficulties for students and educators as they navigate unfamiliar learning environments and instructional methods (Konecki, 2020).

One specific group that has faced unique challenges during this time is preservice teachers. Preservice teachers are individuals currently engaged in teacher education programs yet to attain formal teaching certification (Santagata, 2010). These aspiring educators typically enroll in undergraduate or graduate educational programs, focusing on the holistic development of their knowledge, skills, dispositions, and attitudes essential for effective teaching (Milner, 2006). Within their teacher education curriculum, conducting research is often included to familiarize them with the research process and enhance their abilities as future educators (Gonzalez, 2012). Nonetheless, the sudden transition to distance learning has introduced additional obstacles for preservice teachers in their research endeavors.

Recently, several studies have focused on examining the experiences of undergraduate students when they participate in research during traditional face-to-face learning. This research encompasses various aspects, including the advantages derived from research experiences and the acquisition of skills (Megalingam, 2012; Willis et al., 2013; Padmja et al., 2015; Follmer et al., 2016; Hesse, 2017) and the difficulties students encounter during the process (Dubicki, 2015; Sachitra, 2016; Cheung, 2017; Hart & Annear, 2020; Otoluwa, 2021). However, limited research focuses explicitly on the challenges preservice teachers face when conducting research during distance learning. In order to address this research gap, the present paper focuses on a study that delves into the challenges encountered by preservice teachers while conducting research in the context of distance learning.

2. Literature Review

2.1 Distance learning modality

Distance learning modality is an alternative approach to traditional classroom-based education that allows students to access and participate in academic activities remotely without needing a physical presence on campus or in a traditional classroom setting (Sadeghi, 2019). This learning modality becomes the norm for undergraduate students during the COVID-19 pandemic, leading to significant changes in their educational experience. These modifications have exhibited both favorable and unfavorable consequences on the students. On the positive side, distance learning has allowed students to learn at their own pace and in their preferred environment (Grigorievna, 2021). Additionally, it has allowed students to develop and improve their technical skills as they navigate online platforms and digital tools (Lavrysh, 2022). However, the shift to distance learning has also posed challenges for undergraduate students. Many students have reported lacking engagement and connection with their professors and classmates as virtual interactions have replaced the traditional classroom setting (Greenan, 2021; O'Dea, 2021). Furthermore, the lack of face-to-face interaction has hindered group discussions and collaborative learning, limiting exchanging ideas and perspectives (Bakir et al., Yuan & Wu, 2020; 2020 Calder et al., 2021). Overall, the COVID-19 pandemic has brought about a substantial impact on undergraduate distance learning.

2.2 *Research Program Curriculum*

The course of the research making profoundly impacts critical intended learning outcomes of undergraduates as these equip them in a professional setting (Petrella & Jung, 2008). The Organisation for Economic Co-operation and Development (OECD) has identified teaching skills inefficiencies in the European Union, resulting in a research-based teacher education approach to counter the drawbacks revealed in the report. The Commission of the European Communities has placed a considerable focus on having research competencies in the education curriculum to improve teacher education quality to equip teachers with the growing demand of contemporary times (Ozmutlu, 2022).

In the Philippine context, research as a course requirement in the curriculum for preservice teachers has become one of the critical proficient development programs accentuated by the Department of Education (DepEd) and the Commission on Higher Education (CHED) (Ulla, 2017). CHED exemplifies its promotion of research in tertiary-level education in the Memorandum Order No. 46 Series of 2012, Article V, which orders universities to contribute to the country's developmental endeavors through research (Quitoras, 2021). In line with this, DepEd also released the Department Order, no. 16, s. 2017 detailing the establishment of the research Management Guidelines of (RMGs) to support the Department's research agenda to stimulate and reinforce the research culture in the Philippine education (DepEd, 2017). Advantages are abundant for preservice teachers who participate in a research endeavor as their experiences in research enable them to augment a more solid knowledge of scholarly papers, enlarge knowledge in systematic processes, distinguish a terminal of investigation, reinvigorate a research background, and prepare them in classroom settings (Madan & Teitge, 2013).

2.3 *Undergraduate Students Engaging in Research*

Undergraduate students benefit significantly from research experiences, which have many positive effects. Existing literature has indicated that such experiences contribute considerably to developing students' communication skills, fostering a deeper connection with the concept of 'research' and self-authorship, and promoting increased engagement in extracurricular activities (Little, 2020). Moreover, these opportunities enable students to flourish both professionally and personally by providing avenues to delve into research techniques, apply classroom knowledge in real-world scenarios, explore academic literature, establish meaningful relationships with faculty members and professional researchers (Padmja et al., 2015), and acquire practical skills about analysis, critical thinking, and the technical aspects of research problems (Megalingam, 2012).

The positive effects of research experiences extend beyond the immediate benefits mentioned above. Notably, they have been found to kindle student interest in pursuing graduate studies, fostering a heightened level of engagement in their undergraduate education, bolstering their comprehension of their chosen field of study, and augmenting their practical skill set (Willis et al., 2013). Additionally, students engaged in research activities demonstrate a willingness to collaborate with peers and faculty members throughout the research process, indicative of their openness to cooperative learning (Follmer et al., 2016). Moreover, early exposure to original research activities during undergraduate studies adequately prepares students for the expectations and rigors of leading research at the master's level (Hesse, 2017).

Despite the numerous benefits, undergraduate students face challenges and often perceive research as stressful, complicated, and demanding, leading to negative attitudes toward the research process (Sachitra, 2016). These challenges include difficulties in selecting a thesis topic, insufficient knowledge in thesis writing, anxiety in interacting with thesis advisors, limited access to lecturers, inadequate availability of reference materials, the desire to establish relationships with thesis advisors, and the expectation of experiencing joy and excitement in creative work (Otoluwa, 2021). Additionally, when composing their first academic paper in their initial year of study, students encounter issues in selecting appropriate content, organizing it effectively, adopting a proper stance, addressing grammar problems, and choosing the right words (Cheung, 2017). Consequently, many

undergraduate students need help with the research and writing process (Hart & Annear, 2020), often needing help to produce rigorous research papers (Dubicki, 2015).

2.4 Statement of the Problem

The existing literature highlights the numerous benefits of research experiences for undergraduate students and the challenges they encounter throughout the research process in a face-to-face environment. However, one gap in the current research is the specific focus on the challenges that preservice teachers face in conducting research during distance learning amidst the COVID-19 pandemic. Thus, this study aimed to bridge this research gap by comprehensively investigating the specific challenges that preservice teachers face when engaging research activities within the context of distance learning. Specifically, it sought to answer the question:

- What are the challenges that preservice teachers face in conducting research in a distance learning modality during the COVID-19 pandemic?

Completing this gap will provide valuable insights into the unique obstacles that preservice teachers face in conducting research within a distance learning environment. This understanding can inform the development of targeted support and resources to enhance the research experiences of preservice teachers, ultimately improving their preparedness for future roles as educators.

3. Methodology

3.1 Research Design

This qualitative research explored the experiences of pre-service teachers conducting research in a distance learning modality during the COVID-19 pandemic using the phenomenological approach. Phenomenology is a research method that comprehensively describes an individual's lived experience of a particular event or phenomenon (Mapp, 2008). Online-based interviews were conducted to gather firsthand accounts. The research process involved data analysis, interpretation, and report-writing techniques (Creswell, 2014).

3.2 Participants

This study employed purposive sampling to select its participants, focusing on twenty-five preservice teachers enrolled in their fourth year at a higher education institution in northern Luzon, Philippines, who experienced conducting research in a distance learning modality during the COVID-19 pandemic. Purposive sampling involves intentionally selecting individuals who can provide relevant information based on their knowledge and experience (Robinson, 2014). The researchers decided on the research topics and sought participants who could contribute to the study.

3.3 Data collection

Online interviews were conducted via Zoom, Google Meet, and Facebook Messenger's video chat due to COVID-19 restrictions. Participants' permission to record the interview was obtained before data gathering. A comprehensive interview guide was prepared beforehand to ensure focus, with follow-up questions provided for clarification. Answers were recorded and noted as a backup in case of technical issues, ensuring the safety of all involved. Interviews were conducted at participants' preferred time using their chosen video-conferencing application. Semi-structured in-depth interviews were used, with the number of questions, questionnaire format, and interview length customized for each participant (Buellens & Loosveldt, 2013). The interviews typically lasted around 45 minutes and maintained strict confidentiality (Mack et al., 2005).

3.4 Data analysis

To maintain reliability in the data collected for this study, a manual coding framework was implemented. This framework facilitated thorough examination and organization of interview results. In addition to this, researchers utilized a matrix system which expedited data assessment and identification of recurring incidents (Saldaña, 2021). Transcendental data analysis by Moustakas (1994) played an integral role in analyzing this dataset as well. Highly studied phrases were extracted from transcriptions first to apprehend participants' real-life experience adequately as well as the nature of their responses. These noteworthy statements were then transferred to a coding matrix. The interviewed pre-service teachers (PST) were assigned with a number code (e.g., PST 1, PST 2, PST 3...) for specification. A thorough review of significant statements ultimately led to the identification of defining themes.

3.5 Ethical Consideration

Informed consent was a foundational ethical consideration in this research (Denzin & Lincoln, 2011). A request letter for approval was sent to the Dean of the School of Teacher Education and Liberal Arts before the study. Consent letters were also provided to the research participants, explaining the study's purpose and significance, with their participation being highly valued. Participants' responses, whether they granted or declined consent, were respected. Anonymity and confidentiality were maintained to protect participants from potential harm (Fleming & Zegwaard, 2018), with identities and responses kept undisclosed without permission. Under the Data Privacy Act, permission was sought to record and document the interviews and use the recorded audio and video files for data analysis and interpretation.

4. Results

The interviews with the preservice teachers revealed four themes highlighting their challenges in conducting research during distance learning. The participants in the study expressed challenges related to group dynamics, time disparity, technical dilemmas, and psychosocial struggles.

4.1 Group Dynamics

The theme of group dynamics in research endeavors highlights the challenges participants face due to poor communication, role ambiguity, and discordance. Distance between members hinders effective communication, leading to misunderstandings and impeding internal development.

"The geographical distance between us poses communication challenges, particularly when it comes to completing the research." (PST 1)

"We faced communication challenges and misunderstandings within our group. Virtual communication made me feel nervous, anticipating awkward conversations." (PST 7)

Role ambiguity in research groups caused confusion and inconsistent research output, hindering overall performance and progress. Participants struggled to understand their assigned roles, causing inconsistent direction, and hindering progress.

"We face challenges in task comprehension, often attributed to miscommunication, leading to misunderstandings." (PST 19)

"In distance learning, we find it challenging to observe individual effort and contributions to the paper. Group chats make it difficult for us to identify each member's specific contributions." (PST 18)

"We adjusted for unavailable members and allowed non-participating members to opt out."

The available and present members completed the research paper". (PST 16)

Discordance arises from conflicting ideas, uncooperative behavior, and reluctance to express opinions, causing tension and conflicts among group members. The online setup and learning modality also hinder the development of collaborative skills and misunderstandings.

"We struggled to determine agreement among ourselves, impeding the development of our collaborative skills during the research. Online learning further complicated matters". (PST 17)

"Some members are uncooperative and indifferent to their responsibilities. Additionally, the number of contributing members is as limited as the inputs given in the paper". (PST 21)

"We encountered challenges in communication and interaction, which resulted in misunderstandings and persistent arguments within the group chat." (PST 8).

4.2 Time Disparity

The second theme delves into the obstacles posed by time disparity in research, encompassing issues related to meeting cohesion, time management, participant schedules, and timely feedback. Participants reported a lack of group meeting cohesion due to differences in schedules and availability, resulting in misunderstandings and difficulty in communication.

"We faced misunderstandings as some members were hard to reach in chats (Messenger). Different schedules among us were common excuses for these challenges." (PST 12)

"We encounter attendance challenges due to situational issues, particularly during the methodology phase. Varying class codes, schedules, and technical problems like power outages and internet connectivity further impact our ability to attend meetings." (PST 3)

"We had limited group meetings due to our availability constraints. Being busy individuals, it has been challenging to find a suitable meeting time and maintain consistent communication." (PST 16)

"We struggled with communication and cooperation throughout the study as not all of us were consistently available online." (PST 24)

Poor time management also hindered research progress, as participants struggled to balance academic responsibilities and external factors.

"Only three of us regularly attend and actively contribute to the research. Our online learning commitments necessitate waiting for a suitable time to conduct our research." (PST 4)

"Amidst the pandemic peak, family issues, mental health challenges, and interruptions from other online classes left us with minimal time for research." (PST 8)

Recruitment was time-consuming and challenging, with schedule conflicts and interview commitments disrupting the study timeline.

"During our research, participants sometimes forget the scheduled interview dates, requiring us to reschedule." (PST 14)

"Recruitment is a major challenge for us. Despite positive responses, it becomes difficult when expected participants cannot attend interviews due to last-minute changes." (PST 5)

Limited communication and infrequent meetings with advisors created a gap in support, affecting participants' motivation and interest in the study. Ineffective management from research advisors also contributed to miscommunication and loss of interest.

"In research, we must understand the conditions and commitments of the members and the promoter. However, time constraints have limited our meetings with the coordinator." (PST 1)

"Our advisor's ineffective management led to miscommunication and reduced our interest in the study. The lack of clear instructions, feedback, and difficulties aligning schedules hindered our enthusiasm and limited our use of the group chat." (PST 8)

4.3 Technical Dilemma

The third theme highlights the impact of technical dilemmas on online learning and research progress. Unstable internet connectivity and the scarcity of available literature are significant obstacles, affecting research progress and causing delays. Unstable internet connections hinder access to platforms and resources, leading to ineffective learning experiences. Due to unreliable internet signals, research progress is significantly affected as participants struggle to conduct literature reviews, access valuable journals, and retrieve relevant materials.

"The research is delayed due to poor internet connectivity when there is no connectivity between participants' homes and ours, resulting in a choppy speech during interviews with a weak signal". (PST 22)

"We encountered internet connectivity challenges in online-based learning, with unstable and intermittent signals impeding our access to valuable journals and existing research available online." (PST 21)

The scarcity of peer-reviewed literature and locally made journal articles also poses challenges in the research process, as participants struggle to find credible and reliable sources.

"The availability of existing review of related literature is minimal, with a scarcity of locally sourced materials and a stronger emphasis on internationally published sources." (PST 25)

"The problem in acquiring fundamental concepts for our research study is the lack of credible sources and limited references, which hampers the study's progress due to the limited availability of literature." (PST 17)

4.4 Psychosocial struggles

The fourth theme focuses on the psychosocial challenges that undergraduate researchers encounter while conducting research, encompassing a decline in motivation and coping with research pressures.

Participants reported a decline in interest and motivation throughout the research process, which was attributed to factors such as attitudes toward research, lack of academic support, perceived complexity, and competing priorities.

"The challenge was to stay motivated in acquiring research knowledge and skills, as it was not our priority at the time, and we felt overwhelmed by other commitments." (PST 5)

"The transition to online learning posed challenges in maintaining concentration due to distractions like household chores, schoolwork, and a noisy environment. I frequently found myself juggling research tasks with other homework until exhaustion." (PST 7)

The pressure to meet high standards in research was a significant concern, as participants felt the

expectation of producing research papers that measured up to traditional classroom-based standards. The COVID-19 pandemic and the transition to remote learning additionally hampered their ability to meet these expectations.

"We were pressured to produce high-quality work comparable to a traditional classroom setup, facing limitations and the challenge of impressing despite being physically separated." (PST 2)

"Meeting the standards of writing a college paper is challenging, considering the responsibility of representing oneself and the entire group. Any mistakes made would reflect on the collective effort." (PST 10)

5. Discussion

Notably, this study resulted into four themes on the challenges being faced by preservice teachers during the distance learning modality. These challenges include group dynamics, time disparities, technical dilemmas, and psychosocial struggles.

The primary focus of the study revolved around the challenges associated with group dynamics, specifically highlighting issues such as poor communication, role ambiguity, and discordance, which impeded effective collaboration and hindered the progress of research projects. The research findings strongly emphasized the detrimental impact of poor communication on the outcomes of collaborative research. Inadequate exchanges and an impersonal atmosphere, resulting from communication deficiencies, significantly hindered participants' comprehension and led to frequent misunderstandings among group members. This communication deficit emerged as a substantial challenge faced by research teams, greatly affecting their ability to contribute effectively and undermining the overall progress of the research endeavor. These findings are consistent with prior studies that have consistently emphasized the critical role of effective communication in collaborative research (Vaughn et al., 2018; Beeker et al., 2021; Dusdal & Powell, 2021; Susilowati, 2020).

Furthermore, the study unveiled the presence of role ambiguity within research teams, which stemmed from the poor communication observed. The absence of clear and persuasive communication channels created significant challenges for individuals in recognizing and fulfilling their responsibilities, resulting in confusion and a lack of guidance. Insufficient clarity hindered team members' ability to make meaningful contributions, thereby impeding the overall progress of the research project (Koivumäki et al., 2021). These findings emphasize the significance of implementing effective communication strategies in collaborative research projects to reduce role ambiguity and improve efficiency (Bammer, 2008; Philipps, 2011; Jeong & Choi, 2015).

In addition to communication difficulties, the study revealed that conflicting ideas and a lack of consensus pose significant barriers for research teams. The absence of collaboration and frequent disagreements during decision-making processes resulted in tension and uncooperative behavior, ultimately impeding productive teamwork. The disruption of the harmonious environment necessary for effective collaboration hindered progress and compromised the quality of research outcomes. These findings highlight the importance of fostering a conducive setting that promotes cooperation and efficient conflict resolution within research teams to achieve superior research results (Bammer, 2008; Lee & Mitchell, 2011).

The second theme focuses on the challenges related to time disparity within research teams. Factors such as meeting cohesion, time management, participant schedules, and timely feedback were identified as crucial components influencing these challenges. The absence of cohesive group meetings due to differences in participants' schedules and availability emerged as a significant obstacle associated with time disparity. Inadequate communication and collaboration hindered the organization and execution of meetings, leading to confusion and complications exacerbated by personal commitments, part-time jobs, and disruptions in the learning environment. The study findings suggest that a major hindrance to achieving productive research

outcomes was the failure to coordinate meeting times and accommodate individual scheduling needs (Qiang et al., 2020; Lischer et al., 2021; Dewi, 2022).

Also, participants' poor time management skills posed a notable difficulty. Balancing academic responsibilities with external factors such as family issues and interruptions from other online classes proved challenging. Participants often underestimated the time required for research tasks, resulting in compressed schedules and increased pressure to meet deadlines. Inadequate time allocation for research activities could lead to delays and hinder overall project progress. Efficient time management strategies were deemed essential to address this issue and maximize research output (Cristóba, 2014; González et al., 2014).

Recruiting participants also emerged as a time-consuming aspect of the research process, accompanied by challenges. Participants' hesitations in committing to interviews and conflicting schedules disrupted the study timeline, necessitating adjustments to accommodate their availability. Data collection faced additional obstacles as participants provided limited responses and expressed uncertainty. These results underscore the significance of meticulous preparation and synchronization to overcome recruitment obstacles and ensure the timely advancement of research (White & Hind, 2015; Whitlatch et al., 2019). Moreover, participants indicated a notable challenge in obtaining timely feedback and guidance from their research supervisors. The lack of support resulting from limited communication and infrequent meetings with advisors impacted the researchers' progress. Clear instructions and feedback are crucial for maintaining participants' motivation and interest in the study, as their absence can lead to a loss of focus and direction. These findings highlight the significant contribution of research advisors in providing guidance and timely feedback to sustain the momentum and engagement of researchers (Vukotich & Yearwood, 2014; Cater-Steel et al., 2017).

Another significant theme that emerged from the study pertained to technical challenges, specifically unstable internet connectivity and the scarcity of available literature. Unreliable internet connections posed obstacles to online learning and research progress, restricting access to resources and impeding literature reviews (Slippers et al., 2011; Apuke & Iyendo, 2018; Martin & Westine, 2020). Participants identified unstable internet connectivity as a major hindrance in their online learning and research endeavors, impeding their access to online platforms and resources (Ramli et al., 2020; Zilka et al., 2021). This problem was particularly prevalent in remote or economically marginalized regions, exacerbating the digital divide and limiting individuals' engagement in online learning and research (Stern et al., 2009; Orta, 2019; Boerngen & Rickard, 2021).

Furthermore, the scarcity of peer-reviewed literature and locally produced journal articles emerged as a significant challenge. Participants encountered difficulties in locating credible and reliable sources to support their research, leading to reliance on internationally published materials. This limited access to local perspectives and narratives undermined the contextualization and relatability of their work. The scarcity of accessible and diverse local literature may reflect systemic issues within the academic publishing industry, such as limited funding, language barriers, and accessibility constraints. These factors contributed to the underrepresentation of local research and impeded researchers' access to relevant literature within their specific contexts (Sugiharto, 2021; Piller et al., 2022; Curry & Lillis, 2017; Shpak et al., 2020; Rafols et al., 2016).

The final theme of the study unveiled the psychosocial struggles faced by undergraduate researchers, primarily attributed to a loss of interest and motivation throughout the research process. Negative attitudes toward research, lack of academic support, perceived complexity and demands of research, competing priorities, and the transition to online learning were identified as contributing factors to the decline in motivation (Iqbal & Mahmood, 2011; Kremleva, et al., 2021). According to Usher et al. (2020) and Govender et al. (2021) the psychosocial struggles faced by undergraduate researchers were made worse due to the COVID 19 pandemic and the transition to remote education. The pressure to meet high research standards, coupled with the limitations imposed by the pandemic, created additional stress and hindered their ability to maintain interest and motivation in the research process (Bruner, 2020; Melvin et al., 2021).

Additionally, curriculum congestion, time constraints, lack of training, and unsupportive faculty emerged as

difficulties affecting participants' research interests. These factors likely contributed to a sense of overwhelm and hindered participants' ability to prioritize research activities. The perceived pressure to excel in other subjects while also engaging in research could have potentially weakened their motivation and dedication to the research process (Deemer et al., 2012; Kozlova & Atamanova, 2013). To address these challenges respectfully, it is important to offer appropriate support, training opportunities, and mentoring for undergraduate researchers. Additionally, optimizing curriculum design would facilitate a more equitable distribution of workloads (Johnson et al., 2015; Pierszalowski et al., 2018; Govindan et al., 2020).

6. Conclusion and Recommendation

This study explored the challenges faced by preservice teachers in conducting research during distance learning amidst the COVID-19 pandemic. Four key themes were identified through interviews with 25 preservice teachers - group dynamics, time disparity, technical dilemmas, and psychosocial struggles.

The results reiterate the initial research problem that preservice teachers face unique obstacles when undertaking research remotely versus traditional face-to-face settings. Poor communication, role ambiguity, time management issues, unstable internet connectivity, scarcity of resources, and declining motivation present significant barriers to effective research engagement from a distance. The findings underscore the need for targeted support structures to facilitate remote research proficiency among future educators. An integrated framework of evidence-based recommendations aims to systematically address obstacles across interlinked domains.

At the faculty level, specialized training in best practices for online learning—including communication strategies, workload balancing, and troubleshooting—could better assist students. Additionally, regular advisor check-ins and temporospatial data-informed group assignments may mitigate coordination difficulties. For students directly, supplemental modules in core competencies like methodology and analysis could ease remote research transitions. Promoting collaborative technologies and clear expectations may optimize project management as well. Expanding counseling services could also help address motivational strains. At the institutional level, upgrading infrastructure, forging publishing partnerships, advocating for balanced workloads, and increasing schedule flexibility could expand technical and literature access while enabling impactful investigations. Ultimately, a coordinated support network guided by targeted, multidimensional solutions shows promise for uplifting remote research proficiency and empowering the next generation of educators.

For future research, further empirical inquiries are warranted into training protocols, advisor-advisee relationships, and group assignment matching systems. Additionally, determining high-yield competencies for distance learning research readiness modules merits exploration. Investigating links between collaborative platforms and project outcomes can also inform technological integration. Formal evaluations of counseling services may quantify motivational impact over time. Assessing infrastructure upgrades in rural locales could elucidate relationships with research performance as well. Continued efforts, embedded within coordinated supports and guided by current discoveries, can refine distance learning communities, and empower future educators.

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