eISSN 2788-9114

Journal of Geography Education in Africa

ARTICLE

The effects of microteaching on preservice teachers' self-efficacy in teaching mapwork

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How to cite this article: M. Thenga. (2026). The effects of microteaching on preservice teachers' self-efficacy in teaching mapwork, *Journal of Geography Education in Africa*, 9, 91-103. https://doi.org/10.46622/jogea.v9i.6907.

Article history: 6 January 2026 | Accepted 2 March 2026 | Published 16 March 2026

ABSTRACT

This study examined preservice Geography teachers' self-efficacy in teaching mapwork. This is a foundational yet conceptually demanding component of the Geography curriculum. Guided by Bandura's (1977) self-efficacy theory, the study examined the extent to which microteaching influenced preservice teachers' confidence and perceived teaching abilities. A mixed-methods design was employed in elucidating the perspectives of preservice teachers enrolled in a Bachelor of Education Geography course. Quantitative data were collected using pre- and post-microteaching surveys, while qualitative data were obtained from preservice teachers' reflective accounts after the microteaching sessions. The results demonstrate that the participants' self-efficacy increased following the microteaching. However, some participants reported difficulties with complex concepts such as magnetic declination, bearing, cross-sections, intervisibility, and interpretation. The study concludes that while microteaching positively contributes to the preservice teachers' self-efficacy, it should be complemented by targeted support. This is to address the persistent challenges in mapwork teaching.

Keywords: Mapwork, Microteaching, Preservice teachers, Self-efficacy, Teaching skills

INTRODUCTION

The latest Department of Basic Education (DBE) National Senior Certificate (NSC) Diagnostic Report (2024) indicates that Grade 12 learners perform poorly in mapwork. Based on these reports, Grade 12 learners do not use topographical and orthophoto maps when answering questions. Many South African Geography teachers struggle with mapwork, even though it is regarded as a crucial component of Geography education (Molapo & Malatji, 2024; Nkosi & Mahomed, 2024; Schoeman & Chidzungu, 2025). Naxweka & Wilmot (2019) found that teachers in Namibian schools were often ill-prepared to teach mapwork effectively at grades 10 to 12, despite their diligence, and that teaching methods placed greater emphasis on procedural knowledge than applying knowledge in problem-solving contexts. Teachers in Zambia also experience this difficulty (Pezyo & John, 2025). Thus, there is a need for training approaches that develop preservice teachers' self-efficacy and capacity to teach mapwork successfully.

Microteaching has emerged as a pedagogical intervention holding the promise of enhancing preservice teachers' self-efficacy. Microteaching as a technique enabling preservice teachers to practice teaching brief lessons to small peer groups, and to receive feedback (Menon et al., 2024; Fan & Xie, 2025). This provides a controlled setting for practising and refining teaching skills, and fosters focused feedback and reflection (Ro & Kim, 2024). It then allows preservice teachers to incorporate standards-based practices into their lessons (Menon et al., 2024).

Teacher self-efficacy plays a critical role in shaping content, teaching skills, and learner outcomes (Bandura & Adams, 1977). Bandura (1977) construes self-efficacy as personal judgments of one's capacity to plan and conduct actions. The aim is to achieve specific goals and to evaluate one's self-efficacy level, generality, and strength across activities and contexts (Cerruto et al., 2023). Strengthening preservice teachers' self-efficacy is therefore a key objective of methodology courses and broader teacher-preparation programmes.

Although microteaching is widely used as a pedagogical tool for developing teaching skills across disciplines (Alyami, 2019; Howard-Jones et al., 2023; O'Flaherty et al., 2024), limited research has been done on its effects on preservice teachers' self-efficacy in teaching mapwork. Understanding how microteaching influences preservice teachers' self-efficacy in teaching mapwork is essential in informing teacher-preparation programmes and improving the quality of Geography education. Hence, this study seeks to provide insights that can inform the design of Geography methodology courses. This would enable teacher educators to better support preservice teachers in teaching mapwork with confidence.

LITERATURE REVIEW

Self-efficacy in teacher education

Self-efficacy is central to understanding how teachers develop confidence and skills in their teaching practices. Grounded in Bandura's (1977) self-efficacy theory, this study focuses on teachers' self-efficacy which entails confidence in their capacity to accomplish teaching activities in a manner that results in successful outcomes. According to Ngulube & Ogbonnaya (2023), self-efficacy is an evaluation of one's capacity to perform at a desired level to attain the best possible result. High levels of self-efficacy are associated with a better choice of teaching strategies, greater resilience in the face of teaching challenges, and increased willingness to adopt innovative pedagogical strategies (Tschannen-Moran & Hoy, 2001). Teachers' self-efficacy levels may have an impact on learners. This implies that high levels of self-efficacy can empower teachers to teach more confidently, persist through challenges, and positively influence learners' outcomes. Thus, self-efficacy is critical in understanding and improving teaching practices, particularly mapwork in the context of Geography teaching.

Self-efficacy is influenced by four factors: mastery of experiences, vicarious experiences, social persuasion, and psychological feedback (Bandura, 1977; Hendricks, 2015; Clark & Newberry, 2019). Mastery of experiences is the strongest contributor to self-efficacy because it provides authentic evidence of an individual's ability to succeed. This is because completing a task strengthens an individual's belief in their ability to repeat it (Bandura, 1977). Bhati & Sethy (2022) argue that repeated past success may boost self-efficacy. Thus, preservice teachers who are confident in their teaching skills are more likely to teach mapwork well. Bhati & Sethy (2022) contend that mastery of experiences is the most influential among the four factors of self-efficacy, which is required for an individual to be successful. Vicarious experiences can be increased by observing peers or mentors performing tasks effectively (Bandura, 1977). This helps individuals to strengthen their confidence. As they watch and comment on each other's lessons, preservice teachers become more confident in their teaching abilities. Self-efficacy may increase through social persuasion, by utilising constructive feedback from mentors, peers, and teachers (Bandura, 1977). Peer and mentor feedback are common components of microteaching. They help student teachers improve competencies and confidence in their abilities (Erdemir & Yeşilçınar, 2021), and to identify successful strategies and providing references for progress (Prilop et al., 2021). Mentoring also supports students' self-efficacy (Bhati & Sethy, 2022). Finally, how people perceive their abilities is influenced by their psychological and emotional states. A positive emotional state can boost self-efficacy, whereas stress and anxiety reduce it (Bandura & Adams, 1977). In a teacher education setting, the mastery of content knowledge, opportunities for authentic practice, and constructive feedback throughout training influence self-efficacy.

The implications of microteaching for developing mapwork teaching skills

Microteaching enhances pedagogical abilities and confidence in actual class settings. It is a professional growth opportunity that improves pedagogical skills and strengthens communication abilities (Kroeger et al., 2024). Microteaching helps teachers try out various teaching philosophies and classroom management techniques. It promotes professional development and thus improves teaching abilities. Preservice teachers improve their classroom management and pedagogical abilities and deliver lessons more effectively by participating in an iterative process of teaching, feedback, and reflection (Bell, 2007). The reflective practice is significant in fostering professional growth. Microteaching also fosters a deeper understanding of teaching dynamics and a better preparation for the real-world classroom (Iliasova et al., 2025). Incorporating microteaching into teacher education programmes might be a crucial strategy for developing the confidence and competence of future educators (Arsal, 2014). Feedback and reflection from microteaching can enable teachers to analyse and identify their strengths and areas for improvement, which enhances their self-confidence.

Teaching mapwork in Geography education in South Africa

Mapwork is a critical component of Geography education as it develops learners' spatial reasoning, map interpretation, and problem-solving skills. Mukondeleli (2018) found that a lack of content knowledge, insufficient pedagogical skills, limited resources, and inadequate exposure to practical mapwork activities constrain mapwork teaching. This results in learners struggling with interpretation, calculations, and visual-spatial understanding. Geography teachers in South African schools experience problems when teaching mapwork due to their limited conceptual understanding and weak pedagogical communication (Mukondeleli, 2018; Molapo & Malatji, 2024). This may be due to inadequate professional development, large classes, and overreliance on textbooks (Molapo & Malatji, 2024). Schoeman & Chidzungu (2025) found that a short learning programme can significantly enhance teachers' basic mapwork skills such as calculations, cross-sections, intervisibility, drainage analysis, and spatial analysis. Inadequate prior learning, inconsistent map skills instruction at secondary schools, and weak spatial cognition hinder map literacy for preservice teachers (Larangeira & van der Merwe, 2016). As such, targeted training interventions are necessary to support preservice teachers in mastering both conceptual and practical aspects of mapwork content and pedagogy.

RESEARCH METHODS

This study seeks to establish the extent to which microteaching develops preservice teachers' self-efficacy in teaching mapwork. The study uses a mixed-methods research design. This enables the researcher to gain a deeper and more exhaustive understanding of the phenomenon (Şahin & Öztürk, 2019; Dawadi et al., 2021). By integrating quantitative and qualitative research approaches, the study provides a more thorough and nuanced understanding of Geography preservice teachers' sense of self-efficacy in their teaching practices.

The study was conducted with 67 preservice teachers enrolled in the Bachelor of Education, Teaching Geography course at the University of Witwatersrand. These preservice teachers were purposively sampled based on their involvement in mapwork microteaching. Data were generated from the study participants, using surveys before and after microteaching, as well as participants' self-reflections. The pre-survey focused on preservice teachers' self-perceptions of their general confidence, teaching competence, perceived readiness, and overall teaching skills. The post-survey addressed the same criteria as the pre-survey but also included their self-reflections on microteaching. The surveys before and after microteaching were analysed using descriptive statistics (Bryman, 2008). Self-reflections were analysed qualitatively using content analysis (Bryman, 2008; Creswell & Creswell, 2018).

Permission to conduct the study was granted by the University registrar, the Head of School, and the study obtained ethics clearance through the University's Human Research Ethics Committee (Non-Medical) (protocol number H25/04/42). Informed consent was obtained from the preservice students enrolled in the Bachelor of Education (Teaching Geography course) programme from the University of Witwatersrand before they participated in the study. It was explained that participation was entirely voluntary; thus, all participants partook in the research of their own free will.

RESULTS

General mapwork teaching self-efficacy

By comparison of results from the pre- and post- microteaching intervention surveys, the proportion of preservice teachers reported high teaching ability increased from 37% to 43%, while those indicating low confidence declined from 10% to 7% (Figure 1). The share of participants with moderate confidence remained the same before and after microteaching. The distribution shifts are consistent with microteaching's provision of mastery and vicarious experiences alongside constructive feedback, which are key sources of self-efficacy in Bandura's (1977) framework. The results show a small but educationally meaningful enhancement of preservice readiness to teach mapwork.

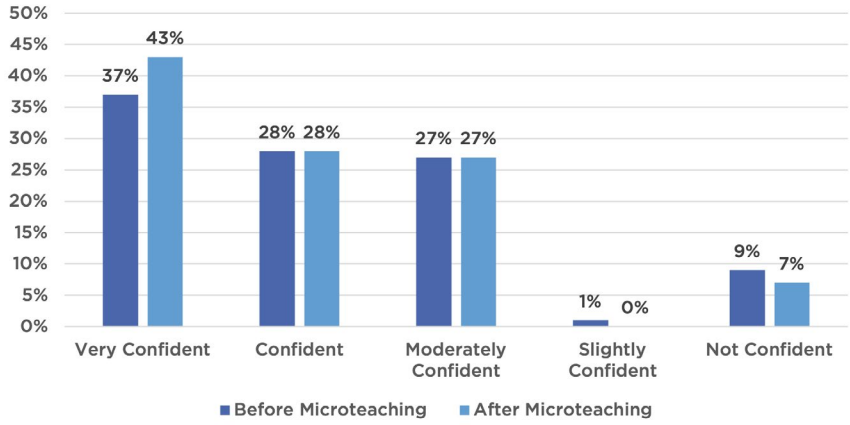

Figure 1. Preservice teachers; confidence levels in teaching a mapwork lesson effectively.

The percentage of preservice teachers who reported very high confidence in their ability to engage students during mapwork sessions increased from 45% to 51%, the slightly confident decreased from 3% to 0%, while the not confident fell from 12% to 7% (Figure 2). The moderately confident category also declined from 18% to 13%. These patterns indicate a reduction in the share of preservice teachers who feel that they are unable to engage learners in mapwork. This pattern is consistent with how microteaching provides mastery experiences, vicarious experiences, and social persuasion that contribute to preservice teachers' confidence in engaging learners.

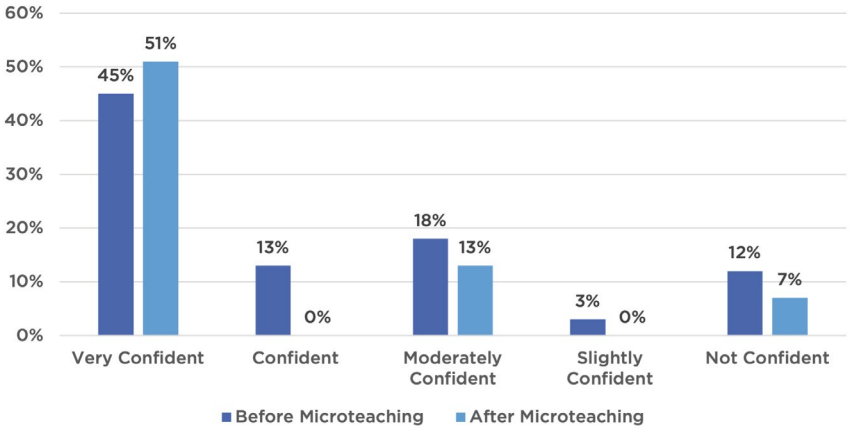

Figure 2. Preservice teachers' confidence levels in the ability to engage learners in a mapwork lesson.

With reference to the ability to explain complex concepts in teaching mapwork, Figure 3 shows mixed results. The proportion of preservice teachers reporting very confident decreased from 34% to 27%, while the confident levels increased from 31% to 33%. The lower tail of the graph shows a decline in the slightly confident from 3% to 0%, while the not confident levels shifted from 12% to 6%, indicating that fewer participants felt unable to explain complex concepts in mapwork. The contraction of the proportion of preservice teachers in the slightly confident and not confident categories is desirable for readiness to teach complex mapwork concepts.

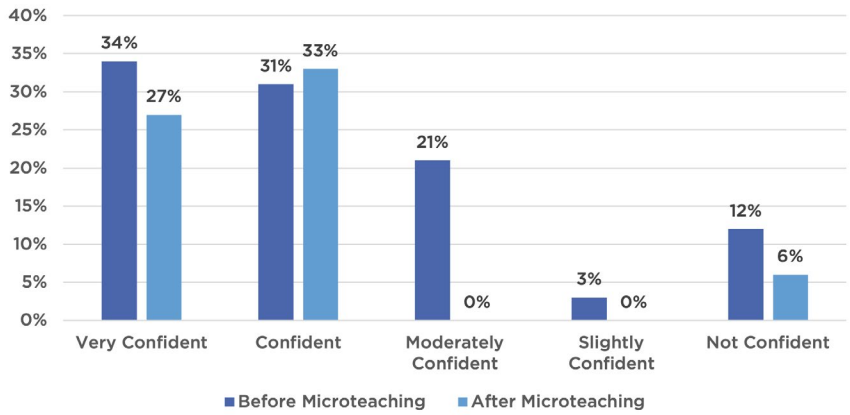

Figure 3. Preservice teachers' confidence levels in their ability to explain complex concepts in mapwork.

Overall, the results indicate that microteaching produced modest but potentially meaningful improvements in preservice teachers' confidence in general mapwork teaching self-efficacy. The shifts were evident in their ability to teach a mapwork lesson effectively, engage learners, and the perceived ability to explain difficult concepts. The mixed outcome for teaching complex concepts implies that while microteaching builds confidence, it also sharpens preservice teachers' insight into areas that require deeper conceptual support.

Self-assessment of teaching skills

Confidence in the skills required to teach a mapwork lesson improved following the microteaching intervention (Figure 4). The proportion of preservice students reporting very confident levels increased from 43% to 46%, while the confident levels increased from 29% to 36%. The moderately confident contrasted slightly from 16% to 13%. The slight and the not confident levels were reduced remarkably. These reflect improved readiness to plan a coherent mapwork lesson.

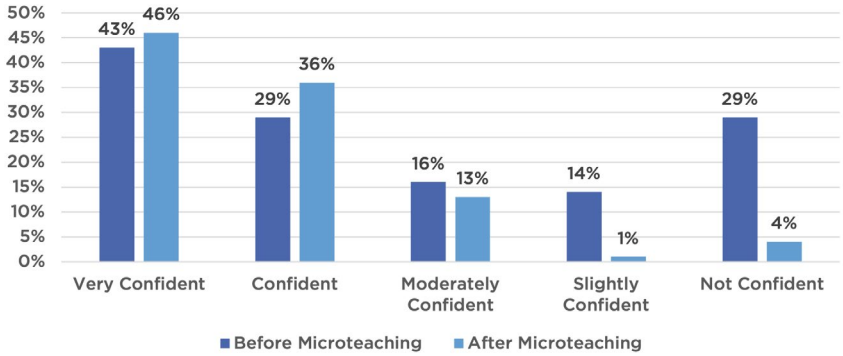

Figure 4. Preservice teachers' confidence levels in skills to teach a well-structured mapwork lesson.

Figure 5 shows that the proportion of preservice teachers reporting very confident levels increased from 52% to 54%, while confident levels increased from 22% to 30%. The proportion of the mid-ranges also increased, while the not confident ranges decreased from 9% to 6%. The shifts are meaningful as they signal an increase in classroom readiness.

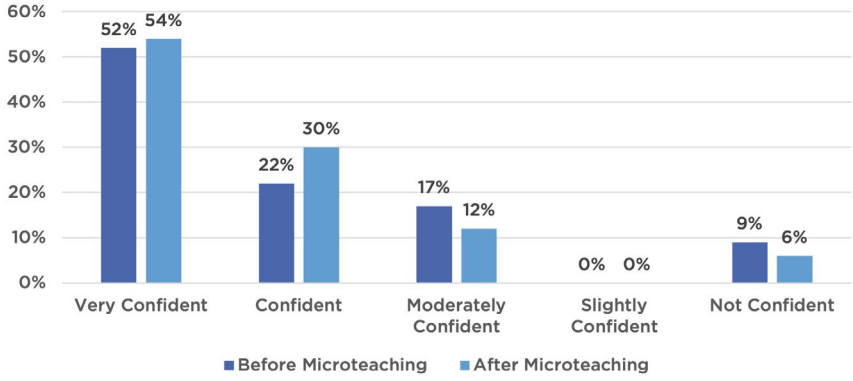

Figure 5. Preservice teachers' confidence in using topographical and orthophoto maps in teaching mapwork.

Generally, the results indicate that microteaching had a positive and meaningful influence on preservice teachers' pedagogical skills in teaching mapwork. The teachers displayed a modest increase in confidence in their ability to plan a well-structured mapwork lesson and use topographical and orthophoto maps. This shows that microteaching is helpful in improving preservice teachers' self-efficacy in their ability to plan and use mapwork resources.

Teachers' reflections

The preservice teachers' reflective accounts offer insight into how participants perceived the influence of microteaching on their confidence, teaching skills, and understanding of mapwork concepts. Reflections revealed that most preservice teachers reported increased confidence in teaching mapwork after participating in microteaching activities. One preservice teacher explained, 'Microteaching allowed me the opportunity to experience how you teach mapwork, and what works and what doesn't work. However, microteaching also allowed me to see how I can improve.' Another participant stated that, 'I am quite confident teaching mapwork. Initially, I was really not confident because mapwork is challenging, and I did not do Geography in high school, but I am now confident. The area that needs development is delivering content.' These reflections indicate that microteaching provided preservice teachers with mastery experiences, which is regarded as the most influential source of self-efficacy development (Bhati & Sethy, 2022).

Participants' reflections on mapwork teaching skills foreground several critical pedagogical dimensions, such as lesson preparation, pacing, student engagement, and assessment practices. Although many preservice teachers reported a sense of confidence in teaching mapwork lessons, a notable proportion of preservice teachers identified challenges associated with time management. These include difficulties regarding lesson preparation, student engagement, and pacing of lessons. One participant said, 'I still need guidance on how to manage time effectively so that I can cover the content I plan to deliver during a lesson.' The findings highlight the significance of vicarious learning experiences, allowing preservice teachers to evaluate their capabilities. These experiences functioned as reference points in the preservice teaching skills assessment, which also contributed to the development of their self-efficacy in teaching mapwork.

Although most participants reported positive learning experiences during microteaching activities, several identified specific challenges related to some concepts in mapwork including bearing, magnetic declination, cross-sections, intervisibility, and utilising topographical and orthophoto maps. One preservice teacher commented, 'Even though the lesson was good, it would have been better to explain the steps that are followed when calculating the magnetic declination.' Another participant said, 'I still think I need help with cross sections and intervisibility.' Such statements illustrate that while microteaching enhanced general teaching confidence, it also exposed persistent gaps in content knowledge and conceptual understanding of specialised mapwork concepts.

Overall, the qualitative results suggest that microteaching contributed meaningfully to preservice teachers' self-efficacy by providing mastery and vicarious experiences. The persistent challenges identified reinforce the need for sustained practice, feedback, and guidance in mapwork activities. Within the South African Geography education context, microteaching is a valuable mechanism for strengthening preservice teachers' self-efficacy in teaching mapwork, to ensure that preservice teachers are better prepared for classroom practice.

DISCUSSION

Evidence from the surveys indicates a slight increase in preservice teachers' self-efficacy in teaching mapwork following their participation in microteaching. This suggests that structured practice opportunities can enhance confidence in this specialised area of Geography teaching. The teacher self-reflections provided insights into how they critically evaluated their teaching competencies. These findings align with Tschannen-Moran & Hoy's (2001) model of teacher efficacy which posits that teachers' self-efficacy is developed through the reflective assessment of their teaching skills and contextual challenges, suggesting a need for ongoing training. Within the South African secondary school Geography context, persistent difficulties in teaching map skills have been widely reported (e.g., Molapo & Malatji, 2024; Nkosi & Mahomed, 2024; Schoeman & Chidzungu, 2025). Naxweka & Wilmot (2019) argue that such challenges are largely attributable to inadequate preparation during teacher training. This implies an imperative to strengthen preservice teachers' competence and self-efficacy in teaching mapwork.

The microteaching activity resulted in relatively moderate improvements in preservice teachers' confidence in teaching mapwork, engaging learners, preparing mapwork lessons, and effectively using topographic maps and orthophotos. Bandura (1977) posits that increases in self-efficacy are mostly associated with successful task performance. This suggests that the structured opportunities to teach mapwork during microteaching functioned as mastery experiences. The vicarious experiences also emerged as a significant contributor to participating preservice teachers' self-efficacy (Bandura, 1977). Indeed, the participants reported enhanced confidence through their reflections whilst also noting persistent challenges such as bearing, magnetic declination, cross-sections, intervisibility, and the use of topographic maps. Schoeman & Chidzungu (2025) documented similar issues with in-service Geography teachers. This means that these challenges are not limited to preservice contexts. Larangeira & van der Merwe (2016) argue that preservice teachers' map literacy is often hindered by inadequate prior learning. This is consistent with the statement made by one preservice teacher acknowledging that they did not take Geography in secondary school.

From a South African Geography perspective, the gains in self-efficacy from the microteaching are remarkable. This is significant given the role of mapwork in senior secondary assessment and the well-documented difficulties commonly associated with teaching this component of the curriculum. The research findings support the view that self-efficacy in teaching mapwork is constructed through experience, observation, and feedback. Preservice teachers' self-efficacy, motivation, and effectiveness in the classroom may significantly increase through microteaching (Cerruto et al., 2023). Strengthening preservice teachers' self-efficacy may be critical in improving both teaching quality and learning outcomes.

CONCLUSIONS

The findings of the study revealed a modest improvement in participating preservice teachers' self-efficacy in teaching mapwork following microteaching activities. Participants reported increased confidence after teaching mapwork concepts to their peers. This suggests that preservice teachers' beliefs about their teaching capabilities were enhanced through practice. However, reflective accounts showed persistent challenges concerning complex mapwork concepts, notably magnetic declination, bearing, cross-sections, and intervisibility. The pacing of lessons, lesson preparation, and strategies for engaging learners were mentioned as additional challenges. These findings underscore the importance of fostering self-efficacy among preservice teachers because it is crucial for effective teaching practices and improved learning outcomes.

Based on the results, the following recommendations are proposed for teacher education institutions, curriculum designers, and Geography methodology lecturers. First, teacher education programmes should provide repeated and structured mapwork microteaching opportunities. These should focus specifically on mapwork and enable preservice teachers to develop mastery experiences and strengthen their self-efficacy. Second, preservice teachers should be provided with opportunities to both teach and observe peers. This is because vicarious experiences and reflective feedback can further enhance their mapwork teaching abilities. Third, future studies could investigate the longitudinal effects of microteaching-induced self-efficacy on preservice teachers' actual classroom performance during teaching experience. This would help to determine the sustained impact of microteaching on mapwork instruction in school Geography contexts.

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