

## **The impact of immersive virtual reality microteaching on pre-service teachers' self-efficacy: A case study with Spanish students**

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The sense of self-efficacy among pre-service teachers (PSTs) has garnered increasing attention in research due to its impact on professional development. Real classroom environments present various challenges, including employing successful instructional strategies, managing classes effectively, and engaging students in learning. The development of these pedagogical skills becomes significantly challenging without the implementation of effective structured techniques during PST training. As a widely adopted practice-based training method used to improve the quality of teacher education, microteaching has proven to serve as a catalyst for prospective teachers to achieve high levels of self-efficacy beliefs. This study examines the effect of microteaching, using immersive virtual reality (iVR) cameras for video recording, on PSTs' sense of self-efficacy in teaching. Specifically, the study explores the following research questions: What are PSTs' levels of self-efficacy for teaching before and after participating in a microteaching practice?; What are the PSTs' insights concerning self-efficacy after the iVR microteaching experience? Our research employs a mixed methods approach, with a view to delving into a nuanced exploration of self-efficacy. We initially conducted a quasi-experimental pre-test-post-test setup, using the Spanish version of the Teacher Self-efficacy Scale (TSES). Subsequently, we held qualitative focus group sessions to explore factors influencing self-efficacy in PSTs, with data analysed using a content analysis approach. The study, conducted at the School of Education Sciences, University of Las Palmas de Gran Canaria, involved 27 English language PSTs from a 1-year Master's programme. For the quantitative analysis, a five-point Likert scale was used, and Cronbach's Alpha was calculated to determine the scale reliability. Both pre-and post-test results for the three dimensions, namely, instructional strategies, classroom management, and student engagement, demonstrated high reliability, with all values exceeding 0.80. Descriptive statistics, including mean and standard deviation, indicate participants' general agreement with statements comprising each self-efficacy component, with a slight increase in the post-test phase agreement across all three dimensions. Correlation analysis revealed no significant links between age, gender, university studies and self-efficacy, but meaningful correlations were observed among the three self-efficacy variables, in both pre- and post-test phases. Furthermore, the Wilcoxon signed-rank test was used to assess the difference in PSTs' perceived self-efficacy before and after microteaching sessions. Significant differences ( $p < .05$ ) were found, particularly in efficacy for instructional strategies. The qualitative analysis used a deductive approach to content analysis following focus group interviews. We structured our analysis around the three dimensions, corresponding to the subscales of the TSES questionnaire. Additionally, we included an eclectic category encompassing transferability, contextual factors, and the impact of emotions on self-efficacy. The findings revealed the significance of practical teaching experiences in instructional strategies, classroom management, and student engagement among participants. Peer feedback and observation also emerged as valuable aspects of professional development. Besides, participants underscored the innovative use of iVR as well as the transferability of skills acquired from microteaching sessions, suggesting their applicability across diverse teaching contexts and levels. The contextual factors surrounding simulated learning environments were also deemed crucial, together with the acknowledged impact of feelings and emotions on teaching performance, with initial concerns gradually giving way to confidence and proficiency. In summary, our

study investigated self-efficacy in a group of Spanish PSTs, focusing on the impact of microteaching with iVR. Our findings highlight that understanding the complex interactions among the different factors influencing self-efficacy can inform the design of more effective teacher training programmes and educational interventions, ultimately enhancing the professional growth and confidence of future educators.

