

From Curiosity to Competence: The Role of Openness to Experience, Digital Self-Efficacy, And Technology Attitudes in Shaping Digital Competence Among Pre-Service Teachers

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Abstract

The rapid digital transformation of Indonesia's education system requires Elementary School Teacher Education (ESTE) students to not only operate technological tools but also apply them pedagogically in classroom contexts. However, variations in students' digital competence (DC) reveal that technological exposure alone is insufficient. Psychological and dispositional characteristics, particularly Openness to Experience (OE), are believed to play a crucial role in shaping students' readiness to engage with digital technology. Despite its relevance, the mechanisms through which OE influences DC, especially via Digital Self-Efficacy (DSE) and Technological Attitudes (TA), remain underexamined in Indonesian teacher education programs. This study investigates the direct effect of OE on DC and the mediating roles of DSE and TA. The study aims to clarify whether OE drives DC primarily through increased confidence or through more positive attitudes toward technology. A cross-sectional quantitative design was used with 400 Indonesian ESTE students from multiple cohorts (361 female, 39 male; mean (SD) age = 18.6 (0.895)). Participants were recruited via online announcements on Instagram and WhatsApp groups and completed informed consent before responding to the survey instruments. Mediation analyses were conducted to assess direct and indirect pathways from OE to DC through TA and DSE while controlling for demographic variables. Findings indicate that OE significantly predicts higher DC, both directly and indirectly. The indirect effect through DSE was significant ($b = 1.031$, $SE = 0.190$, $95\% CI = [0.658, 1.404]$, $p < 0.001$), showing that open individuals tend to develop stronger confidence in using digital tools. In contrast, the pathway through TA was not significant, suggesting that openness influences competence more through self-belief than through general attitudes toward technology. OE

World Conference on Teaching, Learning, and Education



also showed significant direct and indirect effects on all DC dimensions, including basic digital operations, information and data literacy, communication and collaboration, content creation, digital safety, and problem solving and continuous learning. Among these, the strongest influence appeared on the Problem Solving and Continuous Learning dimension, indicating that students who are more open and digitally confident are better able to navigate technological challenges adaptively and proactively. The study concludes that OE plays a central role in shaping ESTE students' DC, with DSE emerging as a key mediating factor. TA, however, does not effectively mediate this relationship. These findings highlight the importance of fostering digital self-efficacy by strengthening students' problem-solving and continuous-learning capacities to enhance their adaptability in an evolving technological landscape.

Keywords: Digital Competence; Pre-Service Teacher Education; Elementary School; Personality; Digital Self-Efficacy