KNOWLEDGE DEPLOYED BY PRESERVICE TEACHERS IN A TEACHING EXPERIMENT ABOUT REASONING AND PROVING

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Mathematics teachers must be able to programme and manage learning opportunities linked with reasoning and proving processes, so there is a need to design and implement effective tasks to revise and develop the knowledge of preservice teachers about them. This research aims to examine the mathematical knowledge about reasoning and proving processes deployed by elementary preservice teachers (EPT) during a teaching experiment about the inscribed angle theorem, focusing on conjecturing and proving. Mathematics Teacher's Specialised Knowledge (MTSK) model (Carrillo et al., 2018) is used for this purpose. This research also seeks potential relationships between this knowledge and the characteristics of the tasks.

The teaching experiment was carried out with 45 EPT, in groups of two or three. The experiment covered a session of 90 minutes. It had three stages: the first two dealt with the conjecture phase of the inscribed angle theorem (firstly drawing and measuring by hand, then using GeoGebra), and the third with the transition from conjecturing to proving and the proving phase. After every stage, questions on the conjecture certainty and if it is or is not enough proved were asked to obtain information of students' personal proof schemes (PS) (Harel & Sowder, 2007). Preliminarily, EPT who give evidence of an analytical PS, showing knowledge about what constitutes a proof, benefit from the characteristics of the experiment: GeoGebra facilitates them to establish the conjecture and gain certainty about it, and the third stage allows them to deploy the knowledge of properties needed to construct a proof, something they did not do before. EPT who show an inductive PS also establish the conjecture in the first two stages, but express that the conjecture is already proved. In the third stage, they deploy knowledge of properties, but the experiment seems not enough to generate the intellectual need of a deductive proof, showing the persistence of inductive PS.

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References

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