2.2. New training and professional development models

SP - (18592) - SCIENCE AND MATHEMATICS INTEGRATION PRACTICES OF PRESERVICE TEACHERS

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Short Abstract

Introduction

The initial teacher education is an adequate context for preservice teachers (PSTs) experience and reflect about science and mathematics integration practices. For a successful integration of subject areas in their practices, PSTs should experience integrated methods in their teacher education courses to explore teaching and learning strategies for integration (e.g. Aguirre-Muñoz et al., 2021; Koirala & Bowman, 2003; McHugh et al. 2018). However, this could be a challenge for teacher education. If PSTs do not learn how to integrate science and mathematics, they could be limited on stablishing links between those subjects (You, 2017), so integrated education is compromised.

Research Questions

The study presents the performance of six PSTs in the integration of science and mathematics in lessons for grades 5-6.

The research questions that guided this study were:

What science and mathematics learning goals were selected for integration by the PSTs in their lesson plans?

What strategies were selected by the PSTs to promote their students learning in integrated science and mathematics lessons plans?

What educational resources were used by the PSTs to promote their students learning in integrated science and mathematics lessons plans?

Methodology

A qualitative methodology focused on case studies was used on this study.

PSTs' integrated science and mathematics lesson plans, the educational resources created by the PSTs and the reflections about their practice were used to collected data.

Data analysis focused on the identification of the science and mathematics learning goals selected by the PSTs to integrate in the lesson plans and the reasons that PSTs' presented to relate those goals, the identification of the strategies used to implement the integrated science and mathematics lesson plans and the type and content of the educational resources created by the PSTs, with a focus on students learning.

Results

This case study shows that the creation of integrated science and mathematics lesson plans caused some challenges to the PSTs concerning the relation of science and mathematics curriculum. Nevertheless, the results show that the PSTs managed to relate the quality of air with numbers and operations, the health of respiratory system and data analysis, and some animal characteristics with geometry.

Concerning the strategies, some PSTs selected the 7E teaching model to organize the lesson plans. About the educational resources, original guides with different tasks were created with the aim to integrate science and mathematics. Those guides were improved after the implementation of the lessons, following the PSTs' reflections about their performance and students' learning.

From the results emerged the importance of discussion and collaborative work for a proper integration of science and mathematics.

Final Considerations

Through this experience of planning integrated science and mathematics lesson plans, it was noticed that the PSTs discussed and argued about the selection of the science and mathematics learning goals until consensus, reflected about the better strategies, type and content of the educational resources to achieve the learning goals of both subjects. This experience contributed for the PSTs' better understanding about the contribute of integration to promote their students' learning on science and mathematics.

References

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