

Including the Sustainable Development Goals in the mathematical training of preservice teachers

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Introduction

The Sustainable Development Goals (SDGs) are a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity. These 17 goals were adopted by all United Nations Member States in 2015 as part of the 2030 Agenda for Sustainable Development.

The UNESCO is calling for a global paradigm shift for curriculum (Marope, 2019) because quality education is not only a Sustainable Development Goal in its own right: it also plays a key role in achieving the other SDGs.

The United Nations have also recognised the fundamental role played by the mathematical sciences in the achievement of SDGs, and all the countries forming the United Nations are making changes in their policies in order to achieve a sustainable future.

Some authors have already pointed out the importance of mathematics and mathematics education in relation to the SDGs and have made concrete proposals for bringing them into the classroom at different educational levels (Domínguez-González & Delgado-Martín, 2022).

In Spain, new curriculums are actually being implemented giving a central place to sustainability in all subjects. In the case of mathematics, it is stated that the subject must include situations related to real data from the 2030 agenda and the Sustainable Development Goals (Ministerio de Educación y Formación Profesional, 2022).

It is therefore essential that preservice teacher are trained from this point of view and, in the specific case of mathematics education, they must be able to integrate mathematics education with education for sustainable development.

Methodology

In order to find out how to design mathematics education for future teachers, an initial questionnaire (pre-test) was carried out as part of a mathematics subject in the Primary Education Teacher degree, in order to find out what they know about the SDGs and how to introduce them in the subject of mathematics. After a short intervention by the teacher, explaining what the SDGs were, pointing out the prominent role of education for sustainability in the new official curriculum, and giving some examples integrating mathematics and SDGs, the teachers were asked to complete a task.

The proposed task consisted of presenting activities and exercises to work on some of the content of the primary school mathematics curriculum using real data related to one or more of the SDGs.

After this intervention, and after the students had completed the requested tasks, they were asked to answer another survey (post-test) to see if their ideas about the integration of the SDGs in their design of mathematic classroom activities had changed.

Results and discussion

With a sample of 28 students, all of them students in the last year of their Primary Education Teaching Degree, the results show that the task carried out led to a significant decrease (3.1 to 2.4 in a 0-5 Likert scale) in future teachers' perception of the difficulty of working on the SDGs in mathematics, with the vast majority of them going from stating that they were unsure about how to work on the SDGs while teaching mathematics to stating that they would know how to do so.

However, not all SDGs are perceived in the same way. When asked about this, students said that the SDGs that are easiest to work on in mathematics are Reduced Inequality, Gender Equality and Good Health and Well-being while the most difficult are Partnerships to achieve the Goal and Industry, Innovation and Infrastructure. After the intervention, students' perceived difficulty in working on each of the SDGs independently in mathematics decreased, although the SDG17: Partnerships to achieve the Goal is still perceived as the most difficult to address in mathematics. In general, these ideas were maintained both before and after the teaching intervention.

After the activity, all students stated that it is a good idea to work on the SDGs in mathematics and were able to give arguments to support their statements.

Conclusions

The focus of this poster is to highlight the initial ideas of the students before and after the interventions, in order to show how they changed the perception of the difficulty of working on the SDGs in mathematics. This intervention demonstrates that it is relatively easy to include the SDGs in the initial teacher education curriculum and to change their perception of how difficult it can be and how to do it. These results can be used for those in charge of the formation of future teachers as a starting point to reflect about how to integrate sustainability in the mathematics curriculum.

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