MODELLING AND DIGITAL TECHNOLOGIES: EXPERIENCES AND CHALLENGES FOR TEACHER EDUCATION

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Curricular designs for secondary education in various countries and educational contexts present recommendations on the incorporation and use of digital technologies and modelling tasks for the teaching and learning of mathematics. However, the implementation of such recommendations is still scarce in several countries. In particular, this situation is prevalent in a significant number of regions throughout my country. While there are factors related to the lack of technological infrastructure, or the prevalence of a certain conservative academic culture that affect the acceptance of such recommendations, the literature reports that teacher education seems to play a key role in whether or not the incorporation of technologies and modelling at secondary school level is encouraged. In particular, it seems that if preservice teachers could experiment with mathematical modelling tasks and technologies during their undergraduate education, this would contribute to making such tasks part of their teaching agendas in the future.

In the analysis of different mathematics teacher education programmes in Argentina, it is possible to recognise different pedagogical approaches regarding the role of technologies and modelling tasks in the processes of teaching and learning mathematics. In this lecture, I will present a particular pedagogical approach that involves modelling and digital technologies in a synergic way. Such approach has been implemented, for several years, in a face-to-face mathematics education course for preservice teachers in a teacher education programme at a public university from Córdoba, Argentina. In this approach, it is assumed that technology is an actor in the production of knowledge, and that modelling is a mathematical activity that involves processes that transcend the treatment of a predetermined mathematical content. Under these assumptions, the preservice teachers attending the aforementioned mathematics education course are invited to form groups and work in modelling projects. More specifically, they are asked to freely choose a topic from reality, and to pose problems to be treated mathematically following the phases of a modelling process and accompanied by the use of technologies, if it were necessary. The modelling projects developed during 2020 by groups of preservice teachers will be presented and analysed. In 2020, in contrast to previous years, due to the covid-19 pandemic situation, the mathematics education course was held in distance learning mode. I will briefly report on: the type of topics that were selected -highlighting the influence of the pandemic context on preservice teachers' choices-, the roles played by digital technologies, the types of learning that occurred, the difficulties that arose, and the appreciation that preservice teachers attach to modelling and technologies for their future teaching activity. Finally, I will refer to the limitations that preservice teachers observed in the proposed approach.