SNAPSHOTS OF THE HISTORY OF THE SIGN SYSTEM OF ALGEBRA IN A COURSE FOR PRE-SERVICE SECONDARY TEACHERS OF MATHEMATICS¹

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As part of the Bologna process, pre-service training of teachers of secondary education has become in Spain a Master degree. Unfortunately, it was decided to adopt the so-called 4+1 system instead of the 3+2 system, which has the consequence that this Master in teacher education lasts one year, including the period of practice spent in a secondary school. In this general framework, the University of Valencia started, in the academic year 2009-2010, a Máster de Formación del Profesorado de Secundaria, which includes, besides the part common to all areas of Secondary Education on psycho-pedagogical and social matters, the practice in schools and the final master thesis, 28 credits on mathematics education. Of these 28 credits, 1 is devoted to the history of mathematics. Having so little time allotted, among the reasons for using history of mathematics in courses for prospective teachers, we concentrate in challenging their conception of mathematics as a set of eternal truths, and in confronting them with the task to try to understand ways of dealing with problems which are familiar to them but that in history are expressed in systems of signs they do not know, and are conceptualised and solved somehow differently.

In this communication we will show a short teaching unit in which some snapshots of the history of the sign system of algebra and of the solving of polynomial equations are presented to the prospective teachers. In some cases the texts from history are presented in what Jens Høyrup has called "a conformal translation" (Babylonian cut and paste methods to solve algebraic problems, and al-Khwārizmī's al-jabr and al-muqābala operations to transform an equation in one of the canonical forms, and the algorithmic rules to solve them); in other cases selected pages from the original texts are presented (Descartes' Géometrie, Recorde's The Whetsone of Witte, Aurel's Arithmetica Algebratica, Viète's De emendatione, Bombelli's L'Algebra). We will discuss one of the tasks given to the prospective teachers and their performances. In this task a page from Bombelli's L'Algebra, which contains the solving of a quadratic equation, is given to the students. They have never seen before Bombelli's sign system (nor Chuquet's) but they have already worked with Babylonian, al-Khwārizmī's, Recorde's and Aurel's texts. Students are informed that in Bombelli's text the first line is an equation, transformed in the subsequent lines step by step to solve it, and they are asked to decipher the system of signs of Bombelli using their knowledge of the transformations which are used to solve a quadratic equation. They are also asked to compare the transformations used by Bombelli with the ones they would used to solve this equation and with the ones they have seen in previous historical text.

¹ This work has been partially supported by the Spanish Ministry of Economy and Competitiveness through projects EDU2012-35638 and EDU2015-69731-R.