

Luis Puig

Universitat de València Estudi General, Spain
luis.puig@uv.es

Joseph Zaragoza's *Arithmetica Universalis* and the teaching of algebra in Spain in the second half of the 17th century

Abstract:

Born in 1627, Joseph Zaragoza joined the Society of Jesus in 1651, and the same year he began to teach arts and theology at the Society's schools in several Spanish cities, including Valencia where he lived from 1660 to 1670. There he also taught mathematics and astronomy privately, and published in 1669 his book *Arithmetica Universalis*, just a year before he moved to Madrid to become a full professor of mathematics at the Colegio Imperial (Imperial College), an institution of the Society of Jesus. Starting in 1625, the Imperial College was funded by Felipe IV, King of Spain, Naples, Sicily and Sardinia and Duke of Milan, with the main purpose of becoming the place to educate the nobility's children. Felipe IV established and funded two Chairs of mathematics, thus turning the Imperial College into a very important centre of study and development of mathematics throughout the 17th century in Spain. Joseph Zaragoza taught there until the end of his life in 1679, publishing a number of other books.

The full title of Zaragoza's *Arithmetica Universalis* is *Arithmetica Universalis, que comprehendit el arte menor, y maior, algebra vulgar, y especiosa* [which includes the minor and the great art, the common and the specious algebra], showing by the inclusion of the "specious algebra" or "algebra of species", Zaragoza's knowledge of Viète's new algebra. Furthermore, Zaragoza's *Arithmetica Universalis* is the first book published in Spain in which one can find Viète's influence.

In this talk, we will present a study of the way in which Zaragoza, having adopted Viète's ideas, reorganised the teaching of algebra in the *Arithmetica Universalis*. We will focus on the characteristics of the symbolic system of signs that he uses (closer to Descartes' than to Viète's), the way he introduces the concept of exponent, the canonical forms of equations that he establishes and studies, the algebraic and numerical procedures to solve equations that he explains and proves, the type of problems he deals with, and the way he presents the Cartesian method to solve problems.

In addition, we will compare Zaragoza's book with other textbooks that are contemporary or follow it in the immediate decades, including Andrés Puig's *Arithmetica especulativa, y practica y arte del algebra*, published in 1672 in Barcelona, Spain, the part on "specious algebra" of *Escuela de Palas, o sea Curso Mathematico*, attributed to Joseph Chafrión, published in 1693 in Milan, Italy, and the part on algebra of Pedro de Ulloa's *Elementos Mathematicos*, published in 1706 in Madrid, Spain.

References

Chafrión, Joseph [attributed] (1693). *Escuela de Palas, o sea Curso Mathematico. Tomo I*. Milan: En la Empronta Real, por Marcos Antonio Pandulpho Malatesta.

de Ulloa, Pedro (1706). *Elementos Mathematicos. Tomo I*. Madrid: Antonio González de Reyes.

Puig, Andrés (1672) *Arithmetica especulativa, y practica y arte del algebra*. Barcelona: Antonio Lacavalleria.

Zaragoza, Joseph (1669). *Arithmetica Universalis, que comprehendit el arte menor, y maior, algebra vulgar, y especiosa*. Valencia: Geronimo Vilagrassa.
