

Statistics Training of Pre-Service Chilean Mathematics Teachers

This research has studied the stochastics (statistics and probability) training of pre-service Chilean mathematics teachers, focusing mainly on certain issues related to content knowledge and attitudes towards stochastics and its teaching. *Mathematics teachers* herein are defined as teachers for grades 7 to 12 of school education. This is, in the case of Chile, teachers for the last two years of the second basic cycle (grades 7 to 8) and secondary education (grades 9 to 12). In this context, this doctoral thesis is organised into four chapters, and including another two dedicated to References and Appendices.

Chapter 1, *Rationale*, begins with an approach to the research problem, where the importance to the field of this thesis is justified. Mathematics' teachers are recognised as key agents in promoting the reform movement around teaching stochastics in schools. Teachers' initial training is highlighted as a key instance to promote the proficiency to teach stochastics. Subsequently, the main literature regarding theoretical proposals for mathematics and stochastics teachers' professional knowledge are reviewed, where we could see content knowledge as a valued aspect across the revised literature. Thus, the main interest of this research is established in content knowledge and attitudes are also considered as a descriptor of the affective domain towards stochastics and its teaching. In this context, the chapter ends with the main background on content knowledge and attitudes towards stochastics in teachers, as well as the relationship between both content knowledge and attitudes.

Chapter 2, *Methodology*, theoretical-methodological aspects that guided and organised this doctoral thesis are highlighted, whose modality is the *grouping of publications*. The chapter begins with the theoretical framework, built from the review carried out in Chapter 1; and the central research problem is formalised. Consequently, the Main Aim (MA), *to analysed the relationship between content knowledge and attitudes towards stochastics and its teaching in pre-service Chilean mathematics teachers* is established. Thus, for the pursuit of this primary aim, five Objectives (Ob) are set together with their respective initial research Hypotheses (H).

Chapter 3, *Findings*, the articles produced as a published output of this doctoral project are included, which correspond to the production of seven manuscripts (five published, one in press, and the other one under review). These papers are related to the partial goals (Ob's) of this thesis

as detailed in Chapter 2. A detailed summary of each of these publications is included in the *Synthesis of Chapter 3*.

Chapter 4, *Conclusions*, begins by contrasting the results obtained with the initial aims and hypotheses. Compliance with the five specific objectives initially set is valued positively. Therefore, regarding the main goal, it is concluded that there is not a clear pattern regarding the relationship between content knowledge and attitudes in teachers, in agreement with previously reported results (reviewed in Chapter 1). In this case, the participants demonstrated poor performance on the content knowledge items but reported a mostly positive attitude towards stochastics and its teaching. Subsequently, the most relevant contributions and limitations of the research are identified. The instruments developed are highlighted as the main contribution, while the use of quantitative methodologies is assumed as a limitation in the case of most previously reported studies. The Chapter ends with the research projections, which are presented as suggestions to update the initial training and professional development processes for teachers in stochastics.