

# INPLASY PROTOCOL

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**Review Stage at time of this submission:** The review has not yet started.

**Conflicts of interest:**  
None declared.

## The Expression of Epistemological Beliefs in Initial Teacher Education: A Systematic Review

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**Review question / Objective:** The purpose of this systematic review is to scrutinize what is known about pre-service teachers' epistemological beliefs in initial teacher training. The research questions which guided the review of these studies were: (Q1) What is the theoretical framework used? (Q2) What is the domain present in the research? (Q3) What have been the main purposes of the research? (Q4) Which have been the methodological procedures used to access epistemological beliefs? (Q5) What are the main research findings?

**Information sources:** Five databases will be used to search and retrieve the articles: EBSCO, ERIC, Web of Science and SCOPUS. This review will not exclude any work based on the date of conclusion as it intends to understand and illustrate the overview of all the research carried out on the epistemological beliefs of pre-service teachers. This will allow access to the explanatory factors of the contours and manifestations that the EB assume in this training phase.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 30 September 2022 and was last updated on 30 September 2022 (registration number INPLASY202290131).

### INTRODUCTION

**Review question / Objective:** The purpose of this systematic review is to scrutinize what is known about pre-service teachers' epistemological beliefs in initial teacher training. The research questions which guided the review of these studies were: (Q1) What is the theoretical framework

used? (Q2) What is the domain present in the research? (Q3) What have been the main purposes of the research? (Q4) Which have been the methodological procedures used to access epistemological beliefs? (Q5) What are the main research findings?

**Rationale:** Although epistemological beliefs play an important role in teacher

intervention, research in this field is scarce and controversial since there is a wide variety of theoretical frameworks. This ambiguity or lack of attention to the teacher's specific knowledge may be responsible for the difficulty in understanding this phenomenon.

In the discussion about initial teacher education, an important approach in which the literature still requires further developments is that of pre-service teachers. Realizing how complex the teacher training process is, requires starting to investigate at the initial stage, since the enigmas of how quality teaching can be achieved, and which teacher characteristics can be beneficial, are still widely unresolved.

Despite the reported importance of its study, little is known about the epistemological beliefs of PSTs, either in relation to the behavior of the phenomenon during initial training, or in relation to the characteristics that drive or mitigate the changes that occur.

The investigation of epistemological beliefs is an opportunity to adapt and recreate the ITE and for that it is imperative to know the characteristics and extent of the research already carried out.

**Condition being studied:** Epistemological beliefs can be described as what the subject believes to be knowledge and how it should be learned (Hofer & Bendixen, 2012; Schommer, 1990).

These beliefs have been the subject of several theoretical interpretations, highlighting general development approaches (King & Kitchener, 1994; Kuhn et al., 2000; Perry, 1970), multidimensional systems (Ferguson, Bråten, & Strømsø, 2012; Hofer & Pintrich, 1997; Schommer, 1990) and its evolution towards the epistemic cognition view (Chinn et al., 2011, 2016; Hammer & Elby, 2002).

Perry (1970) proposed a model that describes 9 levels of epistemological beliefs that range from beliefs about knowledge being objective to beliefs that knowledge is radically subjective.

According to Hofer and Pintrich (1997) epistemological beliefs must be analyzed based on their definition and, therefore,

conceptualized at the level of the nature of knowledge and knowing. In this proposal there are two dimensions related to the nature of knowledge: a) knowledge structure, which varies between the belief that knowledge is the accumulation of isolated facts and the belief that knowledge is the interconnection between concepts; b) certainty of knowledge, which varies between the belief that knowledge is absolute and immutable and the belief that knowledge is provisional and constantly evolving. In the same model, there are still two other dimensions related to the nature of knowing: c) source of knowledge, which varies between the conception that knowledge originates outside of itself and resides in the external authority from which it can be transmitted, and the conception that knowledge is actively constructed by the person in interaction with others; d) justification for knowledge, which varies between the justification of knowledge claims through observation and authority, and the justification based on questioning, evaluation and integration of different sources (Hofer & Pintrich, 1997).

To update the dimensions presented, Chinn, Buckland, and Samarapungavan (2011) considered one more dimension and restructured the model. Chinn et al. (2011) suggested that the simplicity of knowledge is, together with the universality of knowledge, a sub-dimension of the structure of knowledge. The universality sub-dimension recognizes that individuals may believe in knowledge that is universally applicable, or particular to a single context (Chinn et al., 2011).

In the current framework, each dimension varies along a spectrum from “simple” to “complex” or from “naive” to “sophisticated”. Individuals with epistemological beliefs based on a simple/naive position tend to see truth as absolute, while those with more sophisticated/complex positions usually recognize knowledge as mutable and borderless (Northcote, 2005).

## METHODS

**Search strategy:** Search strategy will use Boolean operators and require the title,

abstract, or keywords to include: (“epistemological beliefs” OR “personal epistemology” OR “epistemic beliefs” OR “epistemic cognition” ) AND (“pre-service teacher” OR “student teacher” OR “teacher education” OR “apprentice teacher” OR “practice teacher”). Similar terms or synonyms will be used to guarantee a more inclusive initial search and avoid an excessively narrow scope of analyzed studies. Additionally, the title, abstract and reference list of each study will be manually searched to potentially identify eligible studies not captured by the electronic searches.

**Participant or population:** Pre-service teachers of any subject.

**Intervention:** Reported pre-service teachers’ Epistemological Beliefs at any point of a teacher education program in any school subject.

**Comparator:** Pre-service teachers’ epistemological beliefs that at a given moment or over a period were analyzed. These teachers must be attending a teacher education program in a particular subject – domain specific.

**Study designs to be included:** Studies with qualitative approach (including exploratory, emergent design, hybrid case-study/ action-research, self-study, case study, action research, visual methods) and experimental, quantitative research.

**Eligibility criteria:** Articles will be eligible if they were published or in press in peer-reviewed journals, in Portuguese, English or Spanish and with no restrictions in publication date. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were adopted (Moher, Liberati, Tetzlaff, & Altman, 2009). In addition, following the Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines, P.I.C.O.S. was established as follows: i) participants - Pre-service Teachers; ii) interventions – Reported Epistemological Beliefs at any point of a teacher education program; iii) comparators – Pre-service teachers’

epistemological beliefs were analyzed, explored, or followed throughout a teacher education program. Epistemological Beliefs will be acceptable in the form of domain specificity. iv) outcomes – In the end of this Systematic review it is expected to understand: a) the most used theoretical framework to study epistemological beliefs; b) the methodological context that is most used to report epistemological beliefs in this group of participants; c) what are the epistemological beliefs that these participants reveal during teacher training; and d) how do these epistemological beliefs and initial teacher training relate; v) those who were not empirical studies. Titles and abstracts of retrieved articles will be individually evaluated by the research team to assess their eligibility to be included in this article. The study abstracts that do not provide enough information according to the eligibility criteria stabilized will be retrieved for full-text evaluation. In a second phase, books, book chapters, conference abstracts, thesis, and dissertations will be excluded from analysis, to promote the quality assurance, given the possibility of it had not been subjected to independent and peer-review. Also, based on the study’s purpose, the investigations that did not respond to the objectives or do not contemplate the guidelines of this work, will be excluded. Then, both reviewers will proceed to this analysis and disagreements will be discussed and resolved.

**Information sources:** Five databases will be used to search and retrieve the articles: EBSCO, ERIC, Web of Science and SCOPUS. This review will not exclude any work based on the date of conclusion as it intends to understand and illustrate the overview of all the research carried out on the epistemological beliefs of pre-service teachers. This will allow access to the explanatory factors of the contours and manifestations that the EB assume in this training phase.

**Main outcome(s):** Analysis of the pre-service teachers’ epistemological beliefs.

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**Data management:** Included studies will be analyzed, by the first author, through a thematic analysis after creating a table of contents present in each study on an Excel database.

**Quality assessment / Risk of bias analysis:** Methodologic quality of studies will be assessed using the Mixed Methods Appraisal Tool MMAT (Hong et al., 2018) as it enables us to evaluate qualitative, quantitative, and mix-method studies. Moreover, the recommendations of the PRISMA statement will be followed to improve the clarity, transparency, and quality of the systematic review.

**Strategy of data synthesis:** The initial searching of databases will be exported to reference manager software (EndNote™ X9, Clarivate Analytics, Philadelphia, PA, USA). Duplicates will be then removed. The remaining articles will be then screened (title, abstract and full article if necessary) and removed according to the eligibility criteria and language if not in English, Portuguese, or Spanish.

Successively, summary tables will be generated to summarize data of the selected studies according to the following categories: authors and year; study purpose; framework; domain; data collection; data analysis and main findings of the study. Both authors will review the data synthesis and differences of opinion will be discussed and solved with the third and fourth author until consensus is achieved.

**Subgroup analysis:** None.

**Sensitivity analysis:** To chose later.

**Country(ies) involved:** Portugal.

**Keywords:** Epistemological Beliefs; Initial Teacher training; Pre-service teachers; Systematic Review.

**Dissemination plans:** It is intended that this review is published in an international peer-reviewed scientific journal and disseminated in open-access so that the

entire community can benefit from the work developed.

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