INPLASY PROTOCOL

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None declared.

Role of data literacy training for decision making in education: a systematic review

Sandoval, F[1]; López, JA[2]; Gajardo, C[3].

Review question / Objective: The objective of this systematic review is to examine what is known about the effects of data literacy training on the educational decision-making capacity of teachers and pre-service teachers.
Eligibility criteria: Studies will be included if they inquire about the effect on decision-making ability, if the effect on decision-making ability is measured quantitatively, and if they are of quantitative or mixed origin. In the case of mixed studies, only quantitative information will be included. On the contrary, studies on data mining, learning analytics or big data in education, and studies that do not inquire about the effect on the ability to make decisions of data literacy will be excluded.

INTRODUCTION

Review question / Objective: The objective of this systematic review is to examine what is known about the effects of data literacy training on the educational decision-making capacity of teachers and pre-service teachers.

Rationale: There is limited evidence regarding the effects generated by training in data literacy on the ability to make educational decisions of teachers and pre-service teachers. A search has been carried out in different databases, but no previous or ongoing systematic reviews were found on the effects of data literacy education/training on the educational decision-making capacity of teachers and pre-service teachers. Therefore, it is expected that by carrying out this systematic review it will be possible to provide an updated and systematic summary of the existing research on this subject, providing guidelines and recommendations for the development of

future research and educational practices that are developed in this line.

Condition being studied: The development of skills for the use of data in education from training in data literacy will be studied, in order to know the effects on the ability to make educational decisions of teachers and pre-service teachers who participate in data literacy training and programs.

METHODS

Search strategy: The search strategy for the selected databases will use the elements of the PICO question, considering broad terms for the intervention (data literacy) and for the outcomes (decision making), as well as incorporating (education) as a special situation in which intervention is performed. These terms will be expanded using the ERIC thesaurus, and additionally an instructional services librarian assisted in the development of term selection. Terms within and across concepts will be combined by the Boolean operators "OR" and "AND" respectively. No restrictions will be used for the date, language, or country of publication. The terms associated with population/participants and comparators will not be used to avoid narrowing the search too much and missing studies that may be useful for this review.

A draft search strategy has been developed in Scopus and will be modified according to the specifics of each database: (TITLE-ABS-KEY ("data literacy" OR "data literacy training" OR "data literacy for teaching" OR "data literacy program")) AND (TITLE-ABS-KEY ("decision making" OR "data driven decision making" OR "data based decision making" OR "data use" OR "decision-making" OR "decision making skills" OR "information utilization")) AND (TITLE-ABS-KEY ("education" OR "higher education" OR "college*" OR "universit*" OR "tertiary education" OR "preschool education" OR "preschool" OR "primary education" OR "secondary education" OR "secondary schools" OR "high school")).

Participant or population: Preschool, primary and secondary teachers, higher education teachers and pre-service teachers. It will not be restricted by gender, age, experience, or ethnicity.

Intervention: Interventions focused on data literacy training.

Comparator: Only if possible, the comparator corresponds to people who have not participated in the data literacy intervention.

Study designs to be included: Randomized controlled studies, non-randomized studies, quantitative descriptive studies, and mixed methods studies will be included.

Eligibility criteria: Studies will be included if they inquire about the effect on decision-making ability, if the effect on decision-making ability is measured quantitatively, and if they are of quantitative or mixed origin. In the case of mixed studies, only quantitative information will be included. On the contrary, studies on data mining, learning analytics or big data in education, and studies that do not inquire about the effect on the ability to make decisions of data literacy will be excluded.

Information sources: An exhaustive and systematic computerized search of the electronic databases Scopus, Web of Science and Ebsco Host will be carried out.

Main outcome(s): The main outcome is the analysis of the development of skills for educational decision-making in teachers or pre-service teachers who have been exposed to interventions or training in data literacy. The main outcomes that are expected to be found are associated with the levels of self-efficacy in the identification and access to data, in the technological use of data, in the application of data in instruction. Thus, it is also expected to find results on the predisposition against the data and the associated beliefs. For this, there are validated questionnaires such as the 3D-MEA, COA III Scale or the SEDU.

Additional outcome(s): It is also expected to find results on the advance in knowledge and skills associated with the use of data, measured through data literacy tests.

Data management: The records retrieved in the search will be exported to Rayyan. In this same software, duplicate articles will be eliminated and the titles and abstracts will be read by the authors, in order to select or eliminate articles online, facilitating collaboration between reviewers. The full-text articles will then be extracted into Microsoft Excel software, which will be rigorously designed for proper data extraction. A PRISMA flowchart will be used to graph the selection of studies, including the number of articles at each stage and the reasons for exclusion.

Quality assessment / Risk of bias analysis: The risk of bias of the studies will be reviewed by reading their key components such as authorship, participants, disciplines involved, methodology, the way in which the surveys are applied and the context in which the intervention is administered. The quality evaluation will be carried out through the MMAT Mixed Methods Evaluation Tool, version 2018, which has been designed for the evaluation stage of systematic reviews of mixed studies, that is, reviews that include qualitative, quantitative and methods studies. mixed. It allows assessment of the methodological quality of five categories of studies: qualitative research, randomized controlled trials, non-randomized studies, quantitative descriptive studies, and mixed methods studies. For this study, only aspects associated with quantitative studies will be used.

Strategy of data synthesis: Once the articles selected for review have been extracted, a formal narrative synthesis will be made. For this, an analysis will be carried out based on the research question and the objectives, describing the results obtained, using tables and graphic resources that allow showing the patterns and elements in common between the studies. A descriptive summary and an analysis of the findings of the review will be presented, synthesizing the results obtained regarding the advances associated with data literacy, both for teachers and pre-service teachers after having undergone the intervention. The instruments used for the collection of information will be considered within the results, the characteristics of the included and excluded studies will be presented, the participants, the interventions carried out, their modalities and differences between them will be described.

This review will follow the standard of the PRISMA 2020 declaration as a general strategy, mentioning the keywords, the search strategy, Boolean characters used and the inclusion and exclusion criteria, in order to complete all the elements raised by this protocol.

Subgroup analysis: Nothing planned.

Sensitivity analysis: All aspects related to research ethics will be respected when analyzing the data and writing the systematic review.

Language restriction: No language restrictions.

Country(ies) involved: Chile and Spain.

Other relevant information: None.

Keywords: data literacy; data driven decision making; data use, professional development; decision making; intervention; systematic review; teacher education.

Dissemination plans: This systematic review is expected to be published in an indexed journal associated with research in the field of education. It could also be subject to being presented at conferences or congresses related to the subject.

Contributions of each author:
Author 1 - Fabián Sandoval - Conceived the review, wrote the search strategy and developed the protocol, read and approved the final version of the manuscript.
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Author 2 - Juan A. López - Participated in the definition of the search strategy and the selection of databases, contributed in the methodology and experience when reviewing the protocol. He read and approved the final version of the manuscript.
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