

INPLASY PROTOCOL

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Teaching and Learning Mathematics in Primary Education: the role of ICT. A systematic review of the literature

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Review question / Objective: The aim of this paper is to provide a detailed view of how the role of ICT is being dealt with in the scientific literature within the mathematics teaching-learning process, specifically at the Primary Education stage, as this has certain specific characteristics that influence this process. The aim is to show the state of this literature and of this research, to check where the focus of attention is, what aspects are highlighted and researched, what elements the research focuses on and where the greatest innovations can be found.

Condition being studied: Innovative methodologies using ICT for teaching mathematics in primary education, which can be very effective and appropriate for the students of the 21st century.

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INTRODUCTION

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research, to check where the focus of attention is, what aspects are highlighted and researched, what elements the research focuses on and where the greatest innovations can be found.

Rationale: ICT are key to any teaching-learning process today. The role of these tools in all areas of knowledge, as well as in all educational stages, is fundamental and constant. Thus, the Primary Education

stage and the area of mathematics have not been left out. In recent times, the scientific literature has provided evidence of all this through different research studies.

Condition being studied: Innovative methodologies using ICT for teaching mathematics in primary education, which can be very effective and appropriate for the students of the 21st century.

METHODS

Search strategy: The following combination of keywords has been used in both databases: "ICT" and "Mathematics" and "Primary Education" within Article title, abstract, keywords.

Participant or population: Primary school students (6 to 12 years old), of any gender, country and socio-cultural context.

Intervention: Use of ICT in primary education classrooms for teaching mathematics

Comparator: Similarities in teaching practice through innovative educational strategies with ICT, which have been successful in teaching mathematics. Those that have obtained better results in the evaluations.

Study designs to be included: We have chosen the articles that define interventions with the use of ICT in the teaching activity of primary education, for the teaching of mathematics.

Eligibility criteria: Inclusion criteria: only articles, published after 2010, that address primary school students and that deal with interventions using ICT for mathematics teaching. Exclusion criteria: non-peer-reviewed papers, prior to 2010, addressing educational stages other than Primary Education and not dealing with mathematics teaching with ICT.

Information sources: Electronic databases: Scopus and Web of Science. Searched for

relevant publications prior to 30 september 2022.

Main outcome(s): Any results showing innovative methodologies with ICT for teaching mathematics in primary education.

Additional outcome(s): Active methodologies that accompany the use of ICTs that may be relevant to take into account within good practices in mathematics teaching.

Data management: A data extraction was prepared in a Microsoft Excel, through which the inclusion criteria were evaluated and the selected studies were analyzed.

Quality assessment / Risk of bias analysis: We used the validated AMSTAR instrument for the assessment of the internal validity of systematic literature reviews, which consists of 16 items that globally assess the methodological quality of a systematic literature review.

Strategy of data synthesis: The analysis and interpretation of the results in this systematic review was conducted for research that provided evidence on the use of good practices with ICT in mathematics learning in primary education.

Subgroup analysis: Analysis of innovative methodologies in the use of ICT.

Sensitivity analysis: To adjust for publication bias, a sensitivity analysis was conducted using the trim and fill method.

Language restriction: No language restriction.

Country(ies) involved: Spain (Universidad de Granada).

Other relevant information: This article aims to demonstrate the suitability of working with ICT in the teaching of mathematics in primary education, with the purpose of compiling successful interventions and comparing them, so that they can serve as a model to obtain

evidence of good practices that can be reproduced in education. In addition to studying the innovative methodologies used.

Keywords: mathematics; ICT; Primary Education; teaching-learning.

Contributions of each author:

Author 1 - Carmen Rodríguez Jiménez - Performed the statistical analysis and report. Performed the search and methodological search and made the synthesis of results. Wrote and revised the manuscript.

Author 2 - Juan Carlos De la Cruz Campos - Performed the statistical analysis and report. Performed the search and methodological search and made the synthesis of results. Wrote and revised the manuscript.

Author 3 - María Natalia Campos Soto - Performed the statistical analysis and report. Performed the search and methodological search and made the synthesis of results. Wrote and revised the manuscript.

Author 4 - Magdalena Ramos Navas-Parejo - Performed the statistical analysis and report. Performed the search and methodological search and made the synthesis of results. Wrote and revised the manuscript.