

CERME8: WORKING GROUP 15

INFORMATION AND COMMUNICATION TECHNOLOGIES – ITCs AND MATHEMATICS TEACHING: RESEARCHES DEVELOPED FROM ELEMENTARY TO HIGHER EDUCATION

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This paper is intended to present results of studies related to the research lines: Mathematics Education and Educational Practices in Science Education and Technology. The studies have been developed from researches conducted from Elementary to Higher education.

The study presented here involves the description of researches conducted with undergraduates, master students and teachers, in order to promote reflections about the integration of ICTs and their interfaces in the teaching and learning of mathematics.

The proposed works involve foundation and discussion on the role of ICTs in pedagogic practice of mathematics, of practices supported by technological resources of the Computer Laboratory and Distance Education in order to innovate teaching situations in the classroom.

The studies refer to the context of teaching mathematics among limitations associated with teachers' education, especially in regard to information technology in teaching, and the use of different possibilities that ICTs offer, seeking to achieve alternatives to minimize this problem, pointing out the difficulties that undergraduate students and teachers may have regarding digital inclusion in the school context.

This paper presents a discussion regarding the inclusion of ICTs in mathematics teaching and highlights researches that have been developed and accompanied by the author. The poster is going to describe some examples, ending with a brief reflection-discussion carried out up to now at different levels, and master dissertations related to the study of practical proposals to be applied at school, considering the urgent needs of insertion of mathematics teachers and their pedagogical practice in the digital context.

Scientific Initiation Researches relate to the exploration of freeware to be used in teaching mathematics for Windows OS and Linux Platform. It is

a qualitative-type research whose methodology of data collection includes Mathematics Freeware survey, selection and classification, and educational and interactive websites. Researches also investigate the quality and applicability of software to Elementary Education. Another stage is the creation of pedagogical proposals to discuss mathematical concepts applied to digital classroom that value mathematics argumentation of students and teachers conveyed in these learning environments. Data collection of this stage involves filmed sessions. Organization and analysis of data occur from categories and nomothetic analysis. Results point out that the investigation considers aspects of Mathematics Language and Argumentation of students and teachers besides considering argumentative capability expressed by verbal, non-verbal or written languages.

Graduate Papers developed in these lines of research include studies focused on the importance and use of ICTs in mathematics teaching from Elementary to Higher Education. They are qualitative researches that collect data through questionnaires, interviews, observation and document analysis. The studies consider differentiated proposals in relation to the way how mathematics contents are worked in digital classroom, besides considering the analysis of more specific mathematical concepts such as the exploratory study of geometric representation.

Master Dissertations are studies that involve discussion and deepening of investigative practice proposals of Digital Inclusion, construction of Learning Objects, and the role of Distance Education from platforms such as Moodle, all related to initial and continuing education of teachers. The researches are qualitative, data collection occur from field research, application of activities in digital classroom, filmed sessions, observation, questionnaires and interviews. Organization and analysis of data happen from categories, and results point out that the use of ICTs have been changing the pedagogical practice of the teacher making mathematics more motivating. The resulting study proposals from these researches include reflection on the role of ICTs and Distance Education in the pedagogical practice of mathematics teachers in view of teaching and learning innovations in classroom. Another aspect it is worth highlighting is the implementation of challenging educational practice from ICTs, because they constitute a need for teachers in current reality. Currently there are many public policies providing computer laboratories for all schools in Brazil, consequently teachers need to seek for education to follow the evolving pace of ICTs in teaching.