



RESEARCH IN THE ACTION IN THE DEVELOPMENT OF DIGITAL CONTENTS

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Context: The continuous developments of information and communication technology as a support for math education represents new challenges in the teaching-learning process, which encourages us to keep up a permanent updating and to stimulate the creation of digital contents according to the requirements of the new society. How to recover our experience and keep it in constant creative evolution in the middle of model changes? And from that, what standards can we recommend to the production of digital contents?

Methodology: We adopt action research as methodology to continue the creative spiral of our formation as docents and as the base of the analysis of the experience that we have had in the development of contents to get to the hypothesis that are given for the creation of new digital contents.

Development: After pointing out the research-action methodology, diverse steps are listed, among them: *The background* characterized by the docent practice in the elementary education where the children are the authors, due to the text books and the development of no-digital contents, but that they are going towards the multimedia and cybernetics concepts; *Development of educational software and text books with computation* that incorporate Logo and Basic; *The teacher author* where it was promoted that the teachers in an actualization process and those actualizing the teachers were the authors, highlighting their capacity for hyper linking free text books, writing articles for magazines, and making didactic guides; *Expanding horizons* with the elaboration of prototype collaborative projects in web pages; *Integrated projects* where under a humanistic tendency of math education, an educative project for elementary education was elaborated, with text books for children and teachers, and games for the development of abilities in a CD; *The roll of the leaders* that promoted the formation of leaders of technology projects among those that prepare the teachers, editing for them magazines, web sites, virtual communities, and press publications, in CD and in the web sites; and *Enciclomedia*, project for which a model of integration of the use of technology in the elementary education was created, as well as models for didactic guides, also open toolboxes were designed. For each step we defined the period, the place where it took place, the theoretical framework, the synthesis of the experience, observations and conclusions of the interest of the development of contents. All this is complemented with a proposal of the *Objects of learning* and with recommendations that resulted from the analysis. We show some screens of the products of each step and conclude with the proposal of the standards of development.

Conclusions: Being the author of the contents is a didactic strategy that encourage all the students disregarding their level, since as human beings we are all capable of creating and expressing our knowledge through different media. The development of contents is a dialectic process among the didactic idea and the technology as a medium, multicausal and multimedia, among other things, due to the vision of the project leaders, the political intension, the experience of the authors, programmers, designers, and over all, due to the historic-social experience, that when ignored produce to walk the same ways over and over instead of going forward towards new concepts and realities. A professional development of contents requires of a professional production cell, professional standards, and a work environment that encourages the creativity and collaboration. We notice the importance of the definition of the models in use, the roll of the didactic guide, the technology as a medium that limits or encourages the possibilities, and the flexible interface, compressible and regular for the easy familiarization as well as potent usage of the contents, such that the diversity of learning styles and different intelligences are taken into



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account. The authorship is a strategy that integrates teams, projects, and stimulates the auto realization. The authors require formation as authors and as editors, so they encourage their students to be authors as well.