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A Fuzzy Logic Application in Virtual Education

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Abstract

Traditionally, the teaching and learning process uses many exercises fixing, transmitting and evaluating concepts and knowledge about a subject. Learning is the process of acquiring relative permanent changes in understanding, attitude, knowledge, information, capacity and ability through experience. A change can be decided or involuntary, to better or worse learning. The learning process is an internal cognitive event. To help this teaching and learning process, it is important the use of a computer tool able to stimulate these changes. Also, it is important that it can function as validation and helping tool to the student. These functions are performed by computer systems called Intelligent Tutoring Systems. This paper describes the use of artificial intelligence techniques as a teaching support tool. Using Intelligent Tutoring Systems and Fuzzy Logic, this paper shows, through electronic ways, that teaching will be more efficient and adapted to students necessities, in group or individually.

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Keywords: *Fuzzy Logic, Intelligent Tutoring Systems, Teaching and Learning.*

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1. Introduction

Educational applications using the computer technology are developed since the 60s. Initially, they were classified as Computer-Assisted Instruction (CAI) and used the paradigm of programmed instruction, whose educational methods present an exhibition centered on the teacher form.

First, the student must understand the lesson given by the teacher to then answer any questions and thereby enhance their understanding. That is, teaching can be readily caused by booster schedules, that is, offsetting the desired behavior data moments Richmond [1].

Over time, the theoretical perspectives of educational psychologists tended to migrate to cognitive psychology.

According to Piaget [2], the most of what one learns is on its own initiative and in interaction with the reality that surrounds it. It builds its knowledge. This trend is also seen in the development process of these CAI systems.

With the evolution of Artificial Intelligence (AI) techniques and research in the field of cognitive science, increased the degree of "intelligence" of CAI systems. They came to be called ICAI (intelligent CAI) and later known as Intelligent Tutoring Systems.

One of the main motivations for research on Artificial Intelligence (AI) in Education is to develop principles by which computational learning environments can be designed as places where students can have experiences that are essential and beneficial to them, regardless of their individual differences, previous experiences or other cognitive situations.

Thus, by modeling or using student mapping, these systems can personalize education, harmonizing the presentation with the student skill level and its learning content. Therefore, most systems with these characteristics presents educational methods that provide a way of discovering centered on the student, and tutorials dialogues are basically determined by the conceptual knowledge and the student learning behavior, according to Park [3].

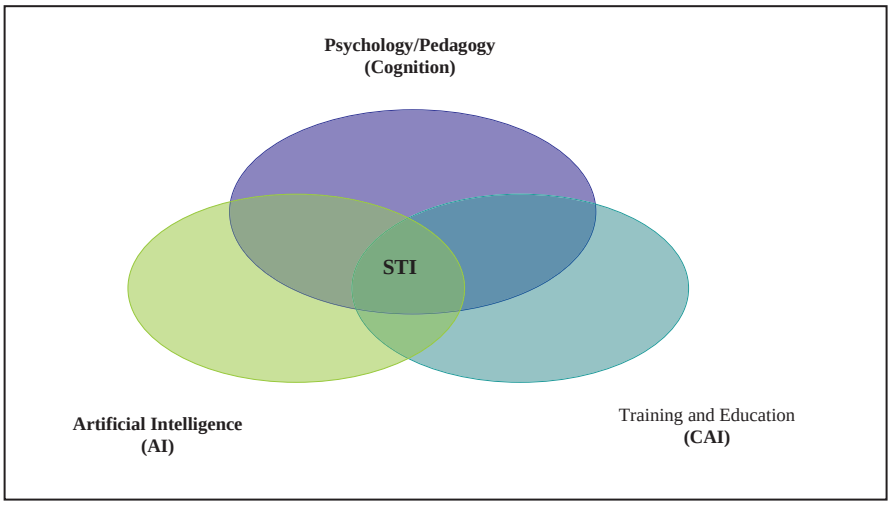

Fig.1. Domain intelligent tutoring applications adapted by the author (Barbalho , 2001)