

# Virtual Instructor and pedagogical issues

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## Abstract

*The scope of implementing a virtual instructor is to achieve enhanced learning outcomes during an autonomous training (education) sessions of a human learner.*

*Based on the evidence of traditional education, the desired outcomes are also depending on the effectiveness of the instructor (trainer). A good and effective instructor often implies improved learning outcomes.*

*But what makes a traditional instructor effective? How virtual instructor technology can benefit from traditional instructors? Will distance education become potential affected of the findings? Those are some of the issues discussed in the current paper.*

## 1. Introduction

The subject of how students learn and acquire knowledge gained major interest by the teachers in conventional education. Over the years teachers have changed their instruction strategies as they kept on learning about students' abilities to learn.

Student Modeling has gained popularity in pedagogical field, as it was consider a critical instruction tool for the teachers. According McCalla, "Student Modeling involves the construction of a qualitative representation that accounts for student behavior in terms of existing background knowledge about a domain and about students learning the domain. Such a representation, can assist an intelligent tutoring system, an intelligent learning environment, or an intelligent collaborative learner in adapting to specific aspects of student behavior" [5].

But what is the case, when it comes to distance education sessions or the employment of Virtual Instructors? Is it possible such research from the past, to affect VIPRG project?

## 2. Pedagogical issues in Distance Education

Asynchronous distance education combines flexible access of teaching material, self-study techniques, and peer-to-peer collaboration. However, literature reveals a number of pedagogical drawbacks regarding this educational mode. Faint monitoring of student performance and/or progress, inability to record individual learning preferences, and lack of student modeling processes are some of the most commonly reported drawbacks. [4],[7],[8]

One of the basic intentions of developing Student Models was to monitor student reasoning, problem solving behavior and misconceptions. Another reason was performance assessment tracing and certification of a student's mastery on a given context. Those issues are critical for effective instruction and they should be always considered during an educational session.

Employment of Student Models as a valuable tool for instructors is not a new idea. Several different uses of Student Models had been reported in the literature [12], [6], [3], [9]:

- a. Planning education: What topics are to be learned? Which are well known?
- b. Planning delivery: What experiences are suitable to encourage learning of the intended topic and which previous experiences can be utilized?
- c. Generating feedback: Feedback on performance should build on previous knowledge as well as current conditions.
- d. Misconceptions' Remediation: Remediation of misconceptions can be done by pointing them out to the student, either by providing counter evidence or by heaving a meta-level discussion.

All and each of the above mentioned uses, offer critical contribution to (virtual) instructors in order the latter to increase their effectiveness.

## 3. The role of Virtual Instructor

Student Models in distance education act as an intermediate communication component between the tutor and the students, recording the tutor's

suggestions and feedback regarding the students' progress in addition to the comments made by the students regarding their personal problems or the misconceptions which occurred [11]

Virtual Instructor to be effective should be able to identify ways to adapt and guide teaching on an individual basis, according to the student's cognitive characteristics and learning behavior. Such process is not always easy or even possible to be achieved.

Virtual Instructor should be able to monitor learning paths among the learning material, and provide emotional and instructional advices to the potential student. The Instructor should act similarly to a distinguished coach who is capable not only to provide the appropriate technical advices, but also to encourage the players by providing emotional motivations, and taking advantage of the personal characteristics of each player in order to gain athlete's maximum performance.

Carrying on this metaphor one step forward, the Virtual Instructor (as the above mentioned coach) should be able not only to be aware of the current status of the "game" but to be able to predict future strategies and alternative patents –solutions when a problem occurs.

Arguing that a good instructor (or coach) is an experienced one, the Virtual Instructor should be able to learn from practice and make uses of the acquired experience. Employment of techniques like Case Based Reasoning (CBR) may have positive contribution towards the solution of that issue. Although CBR is a method primarily used in the field of artificial intelligence to explore a range of human cognitive behavior such as learning and problem solving techniques based on specific cases previously encountered [2], positive results using CBR in education sessions have been also reported [1],[10].

It is worthwhile to explore all these potentials during the VIPRG project and evaluate how and if all these "old fashioned" but not forepassed/ discommend ideas will affect nowadays research.

The future is here for us to generate it...We have just to wait and see...

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