

Chapter 4

Designing a Multi-Agent System for Improving the Accounting E-Learning

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ABSTRACT

Higher education in accounting has witnessed, in time, a massive development, a fact that has required the identification of the most efficient training methods based on competencies so as to meet the new professional challenges. Computer-based training represents a didactic method that improves accounting education. This chapter presents some elements regarding e-learning in accounting and how the educational software can include artificially intelligent elements that may humanize the dialogue of the teacher-computer, like pedagogical agents. The authors present the main ideas of how they designed and developed a multi-agent system that has been incorporated into an educational soft that was tested and validated within an experiment with the students from the specialization of Accounting and Management Information Systems of the Vasile Alecsandri University of Bacău, Romania.

INTRODUCTION

This chapter has an interdisciplinary nature, finding itself on the crossroads of accounting, distributed artificial intelligence and the sciences of education. The chapter is based on (Patrut, 2010), (Patrut, 2013a) and (Patrut, 2013b).

The education in accounting should be formative and not informative; therefore there should be a transition from a type of education based on providing knowledge to one that is based on competencies development, from teacher-centered education to student-centered education. These things are successfully achieved in interactive distance education.

Higher education in accounting has witnessed great development in time contributing, on the one hand, to the training of many promotions of accounting professionals and, on the other hand, to the promotion of accounting both as practical activity and scientific theory. Expanding accounting education requires finding the most efficient methods of knowledge-based instruction so as to cope with the new professional challenges.

Whereas skills or competencies refer to the attributes required so that persons may profess as professionals, competence refers to actually demonstrating the professing of the profession.

In (Patrut, 2013a) we formulated the professional competencies acquired through the account-

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ing higher education and we identified the learning units that the student needs in order to acquire them, within an interactive educational process.

For the subject of “Fundamentals of Accounting” the specific competencies are:

1. Knowledge and understanding competences;
2. Competences to explain/consult and interpret/demonstrate accounting principles, the procedures of the accounting method etc.;
3. **Instrumental:** Applicative competences;
4. **Attitudinal Competencies:** Obeying the financial-accounting legislation; assuming responsibility for the suggested economic solutions; developing logical accounting thinking; developing ethical conduct.

Legislators are constantly establishing new fiscal or accounting regulations that affect the content of the learning process in accounting. Legislative changes are natural in a dynamic society like Romania - a country that adjusts its economic and legal system to the one of the European Union and that tends towards a functional market economy.

Secondly, the Romanian society constantly feels the need of forming new accounting specialists, adapted to the market requirements. The number of companies has constantly increased; some of them disappear to give way to others that are more adjusted to the requirements of the European Union; there are mergers or divisions of companies and all the financial-accounting problems have to be dealt with by accounting professionals. Their number has increased in recent years and this fact shows both the interest of people in the accounting profession as well as the need for specialists in this field.

As well, the new information and communication technology have altered the role of the accountant a lot. According to the International Accountants Federation, the accounting professional is not only required to use information systems and practice computer operation skills, but

he should also play a major role as part of a team involved in evaluating, designing and managing information systems.

Moreover, the role of the (Romanian) accountant has changed as he no longer has to be a mere “bookkeeper”, but an advisor for the manager. The knowledge based society, the occurrence of adaptable and intelligent companies, of virtual organizations face accountants with other new challenges. Thus, the accounting profession experiences new dimensions, and accounting education should take this into account.

The computer comes to support accounting education. Accounting education keeps up with technology and teachers have to anticipate its impact upon the learning ways. Computer-based training represents a didactic method that improves education and facilitates the student’s access to a greater amount of well-organized and structured information that may be viewed in different ways. This didactic method enjoys special pedagogic qualities given by the synthesis between programmed training and the technological availabilities of the computer.

What is it that makes a teacher irreplaceable in the training-educational process? Obviously, it is neither the amount of information that he may own nor the possibility that he may easily pass it on to his students but rather his human, social nature, the ability to select the appropriate information for the appropriate time, the ability to correctly assess students, to give them rewards or warnings, to meet the students’ expectations and show empathy. A gifted teacher puts himself into the student’s shoes and, based on the mistakes that the latter makes, is able to guess the gaps that he has in the knowledge of the field and is, therefore, able to better guide his training process. The tests chosen, the questions asked by the teacher are crucial in a student’s training (Patrut, 2013b).

A teacher is good if he manages to identify the weak and strong points of a student, if he manages to stimulate him when he turns lazy or gets bored, or to accurately provide the information needed in

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