The parmenide project: how to combine e-learning, e-practising and e-tutoring

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Abstract—In this report is described a didactic methodology combining current e-learning methods and the support of Intelligent Agents technologies. The aims is to favour the synthesis among theoretical approach and based practical approach using the so-called Intelligent Agent, software that exploits the Artificial Intelligence and that operates as tutor, facilitating the consumers in the trainings operations. The paper illustrates how such new intelligent Agent algorithm (IA) is used in the training of employees working in the transportation sector, thanks to the experience gained with the Parmenide project.

Index Terms—Intelligent Agents, Learning by doing, Artificial Intelligence, Virtual Tutor.

I. INTRODUCTION

The project aims to described a didactic methodology combining current e-learning methods and the support of Intelligent Agents technologies. The aim is to favour the synthesis among theoretical approach and based practical approach using the so-called Intelligent Agent, software that exploits the Artificial Intelligence and that operates as tutor, facilitating the consumers in the training operations. The paper illustrates how such new Intelligent Agent algorithm (IA) is used in the training of employees working in the transportation sector, thanks to the experience gained with the Parmenide project.

The PARMENIDE project - Promoting Advanced Resources and Methodologies for New Teaching and Learning Solutions In Digital Education - is a two-year pilot project co-funded in the framework of the Leonardo da Vinci Programme, with the specific aim of addressing updated and effective training for technical staff employed in railway and airport sectors.

The rationale behind the project is represented by the limited resources in terms of teachers, spaces, but above all of the distant users’ available time, the latter being far from the places of teaching, of students-workers and, particularly, of those workers that want to improve their knowledge or need to update their professional skills.

In this perspective PARMENIDE project, by promoting a new knowledge acquisition methodology in e-learning mode, aims at developing and spreading innovative learning opportunities for teachers and students, offering them the possibility to improve their respective qualifications. The trainers are involved in critically re-thinking their own way of training thanks to the use of IA and in order to collaborate to the re-definition of contents production modes, so that the learning methodology proposed turns out to be effective. The IA permit to harmonise theoretical with practical, experiential training on-the-job, following virtual learning by doing; students acquire practical skills, thanks to the experience coming from an educational use of devices, systems and equipments. Compared to traditional multimedia learning systems, contents delivery becomes highly interactive and personalized, following individual paths considering the natural inclinations of students and respecting the different knowledge acquisition times, different from an individual to another one. Virtual tutors may use Artificial Intelligence methods to evaluate in depth the student’s performances and reactions and adapt teaching to specific needs and environments as much as possible. They show the student how to accomplish a rather complex task, such as for example controlling an assembling process, using a mechanical circuit, repairing a system or specific machines; they take advantages from non verbal behaviour in order to attract the student’s attention on crucial moments of learning. Virtual tutors, thanks to their anthropomorphic features, make interaction between student and learning system more interactive, involving and effective, allowing to improve contents use and considerably increasing the student’s learning level through an active experiential participation.

II. DIDACTIC MODEL

Currently, the simulators are used for training in the sector of transport, for professional figures caked to control the vector, for example pilots, ships and/or submarines captains, trains and high speed underground trains drivers etc. on one hand, simulators are not very useful in order to make interventions in complex non-standard situations, on the other hand, they seldom allow a constant dialogue with the teacher/trainer who helps understanding the mistake on has made and how one must behave in order to avoid repeating it.

The analysis of training processes in the sector of transport, and in particular in the sector of air and railway transport, highlights a widespread use of
driving simulators, but nothing seems to be available for simulation process and the trainer’s directs interventions for safety operators. The error margin of such operators must be equal to zero, and not always in the operator sure about what would happen in case of a mistake and of an intervention taking place while not following the procedures. In particular, the pedagogical methodology here proposed aims at favouring the difficult synthesis between theoretical approach and practical approach based upon strong experiential components (learning by doing) having IAs as its own basis.

II. CONCLUSION

PARMENIDE, by promoting a new knowledge acquisition methodology in e-learning mode, aims at developing and spreading innovative learning opportunities for teachers and students, offering them the possibility to improve their respective qualifications. The trainers are involved in critically re-thinking their own way of training thanks to the use of IA and in order to collaborate to the re-definition of contents production modes, so that the learning methodology proposed turns out to be effective. The IA permit to harmonise theoretical with practical, experiential training on-the-job, following virtual learning by doing; students acquire practical skills, thanks to the experience coming from an educational use of devices, systems and equipments.

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