L.I.M.E. A recommendation model for informal and formal learning, engaged

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Abstract — In current eLearning models and implementations (e.g. Learning Management Systems-LMS) there is a lack of engagement between formal and informal activities. Furthermore, the online methodology focuses on a standard set of units of learning and learning objects, along with pre-defined tests, and collateral resources like, i.e. discussion fora and message wall. They miss the huge potential of learning via the interlacement of social networks, LMS and external sources. Thanks to user behaviour, user interaction, and personalised counselling by a tutor, learning performance can be improved. We design and develop an adaptation eLearning model for restricted social networks, which supports this approach. In addition, we build an eLearning module that implements this conceptual model in a real application case, and present the preliminary analysis and positive results.

Keywords — Technology-enhanced Learning, eLearning, Personalization, Social Network, Conceptual Educational Model

I. INTRODUCTION

Social networks focused on a specific topic or community are a powerful and precise means for user communication and interconnectivity, no matter the role they stand for. These can be learners, teachers, employees, staff, academic managers, or financial directors, who show a very determined attitude, depending on their context and their objectives. Every user can question, answer, start an activity, follow another, comment on someone else’s job, score a job made by others, search onto Internet, follow a scheduled test, participate in a video-conference with a teacher, and so on. And, in all these activities, any user can be pro-active, reactive, passive, consumer, producer, dealer, and yet to show some additional facets.

To this extent, we design and develop a conceptual model, L.I.M.E. as for Learning, Interaction, Mentoring, Evaluation. These four vectors are measured and analysed as the pillars for the learning scenario, and they are depicted in various inputs which feed the model. Furthermore, we implement this model in a learning ecosystem, restricted by user access and topic. This implementation of the personalised learning model, which deals with every single input and feature aforementioned, provides the user with adaptive tutoring, thanks to a rule system. In this ecosystem, the users interact one with each other, and with the system, and they get personalised counselling.

Before and after the design and implementation of the L.I.M.E. model as a case study, we have carried out a hybrid approach mainly with qualitative studies, supported by some additional quantitative studies, with various groups of experts and end-users. Hence, we have designed and executed a Delphi study to retrieve and categorize the user requirements, as well as a number of semi-structured interviews. Furthermore, we have organized two focus groups with different experts, and one quantitative questionnaire with the students involved in the application case. In addition, we have elaborated a comprehensive state-of-the-art which combines cross-engaged topics for eLearning processes like, i.e. Education, Communication and Technology.

It is proven that the learning itinerary provided by the L.I.M.E. model is efficient and effective, and therefore, it increases the user performance. To show this approach, we have designed and implemented a learning scenario in a real class, which we have split in two groups (experimental and control) of 24 students, each. We have selected and analysed a subject of an official university online programme, during 4 weeks. This scenario engaged formal and informal activities with a comprehensive approach. The implementation shows successful results which prove the validity of the model. In addition, we have got useful recommendations and promising conclusions for further versions of the model, out of the rounds of expert and end-user consultations.

The combination of 48 learners, along 4 weeks and related milestones, the measurement of 30 inputs focused on informal and formal settings and distributed along the four main vectors, has resulted in a large dataset with sufficient information to retrieve meaningful and significant interpretation. The main outcome highlights that there is a clear and positive influence in the user performance, when the L.I.M.E. model is implemented. Furthermore, L.I.M.E. shows to be effective and efficient. This conclusion is supported by a 10,53% overall average difference between the experimental group and the control group (66,72% - 56,19%), with a peak difference between corners of 37,37% (81,41% - 44,04%). These overall results, along with the partial ones which are presented along this research, support seamlessly the online personalised learning model for thematic, restricted social networks, L.I.M.E.