Applications

Using e-learning: The students' point of view

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Abstract

This paper discusses results obtained during a research project aimed at developing an e-learning platform for university courses, called Intelligent Web Teacher (IWT). Most studies of this kind are based on expert assessment, either software developers or competent users; in this research we analyzed students' point of view through qualitative data. In particular, three thinking aloud protocols were collected during a study session at the university lab. Four university students (two of them worked in dyad and produced one protocol), from 19 to 23 years old, volunteered to be trained for thinking aloud sessions while using the platform. Discourse analysis is used to discern how meaning was organized in the three protocols and to discover what topics emerged during use of the e-learning platform (Sacks, 1992; Schegloff, 1992). Based on the gathered list of topics, a set of recommendations useful to both software developers and educators is outlined. Finally, it is suggested how to promote an active e-learner profile in place of the passive profile that emerges.

1. Introduction

The incredible increase of e-learning within university contexts is proved by last ANEE analysis (Liscia, 2004). Educational courses organized with distance learning formats are always more available for any level of university training, from basic courses to PhD. If at the start-up of this trend only a few pioneer centres[1] offered e-learning environments, nowadays a larger number of universities are setting-up and managing research and practical activities for distance learning.

A large number of e-learning platforms and environments is now used and experimented, and distinctions are made between commercial, in-house, and open-source platforms (Rivoltella, 2003). Some of these e-learning environments are developed by big international corporations. It is the case, for example, of WebCT, Blackboard, Saba and IBM Lotus. Others are freeware, although their interface and tool design is not always different from commercial products. This is the case, for example, of Claroline, Moodle, and SpaghettiLearning.

Finally, there are in-house platforms produced by engineers or teams of computer scientists. This is the case, for example, of IWT developed by MOMA at the University of Salerno (Italy), which is the platform object of this article.

In any case, the literature on web sites usability and on the pedagogical aspects related to the design of digital environments sustains the need for the final users to get involved in designing of new technology (De Corte, Verschaffel, Entwistle & Merriënboer, 2003; Kensing & Blomerg, 1998). In fact, technological and pedagogical complexity of an e-learning environment can represent a good opportunity for expert users to learn more, but it can be an obstacle for less competent students (Chi, Glaser & Farr, 1998). Therefore, exploring users' perception of e-learning activities can be useful in order to provide tailored learning opportunities.

In the study presented here we will report students' perception and representation of an e-learning platform used as part of university courses. Topics emerging during three thinking aloud sessions will be commented. Discrepancies between software developers' expectations and students' points of view will be highlighted and recommendations for further improvements of the platform will be outlined.

In the following we first give a short description of the platform to which this study refers (IWT), right after we report the study and the results gathered.

2. The platform IWT

IWT (Intelligent Web Teacher) is a platform developed by MOMA s.r.l. in collaboration with the University of Salerno.[2] It is an in-house platform with an

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[1] For example, Cep@d, Carid; Metid; Kairos and FAR in Italy. *Open University* in Britain, *CNED* in France, *UNED* in Spain, *FernUniversitat* in Germany and OUNL in Holland.
[2] In particular with the Centre of Research on Pure and Applied Mathematic (CRMPA).

intuitive and interoperable interface design. The platform can be accessed through two different «views»: as teachers and as students.

The teacher-view offers the possibility to build two kinds of courses: simple courses which are the result of a collection of learning objects; and intelligent courses, based on ontologies. Ontologies were first defined philosophically as the metaphysical study of the nature of being and existence. AI reconceptualized ontology as a description of concepts and relationships relevant to an agent or a community of agents. This definition is consistent with the usage of ontology as set-of-definitions-of-concept and as relationships between concepts. This is the definition of ontology also found on the online lexical environment system called Wordnet.[3] IWT follows this definition in its design and management. This means each time a teacher wants to create a new course she/he has to organize a net of pertinent concepts related to a specific topic or module, and to determine hierarchies and relationships between concepts. The procedure to create such courses is quite easy.

Teachers first create an ontology, then they save it and create an intelligent course by adapting it to students' features. In fact, depending on students' knowledge and preferences, the course will display different contents in different ways. Students' profiles are defined through an initial test aimed at classifying them within certain criteria. Resources are indexed both in a didactic and descriptive way. This index is used to allocate resources to students depending on their age and other contextual elements are required to be submitted by students when they enroll to a course.

The student-view consists of a list of courses available. Students can choose which one to enroll to by simply selecting it. Once a student has chosen a course, she/he can navigate through the materials and participate to the online activities. Figure 1 displays the IWT interface of the student-view.

3. The research aim

The Cognitive Science Group (CSG)[4] has been established at the Department of Communication Science at the University of Salerno when the first version of IWT has been offered as part of the courses at the University of Salerno. A team of engineers and computer scientists developed the platform and many university teachers participated to the development of IWT. Thus, the platform was quite sophisticated under the technical point of view and it has been judged satisfactory by most of the teachers who used it. The CSG was required to sustain MOMA in

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[3] http://wordnet.princeton.edu/
[4] This group is lead by Prof. R. Cordeschi and it is composed, beside the two authors of this paper, by Antonio Natale, James Brucato, Daniel Donato, Gianluca Pronitti. We like to acknowledge the contribution of all of them to this paper.
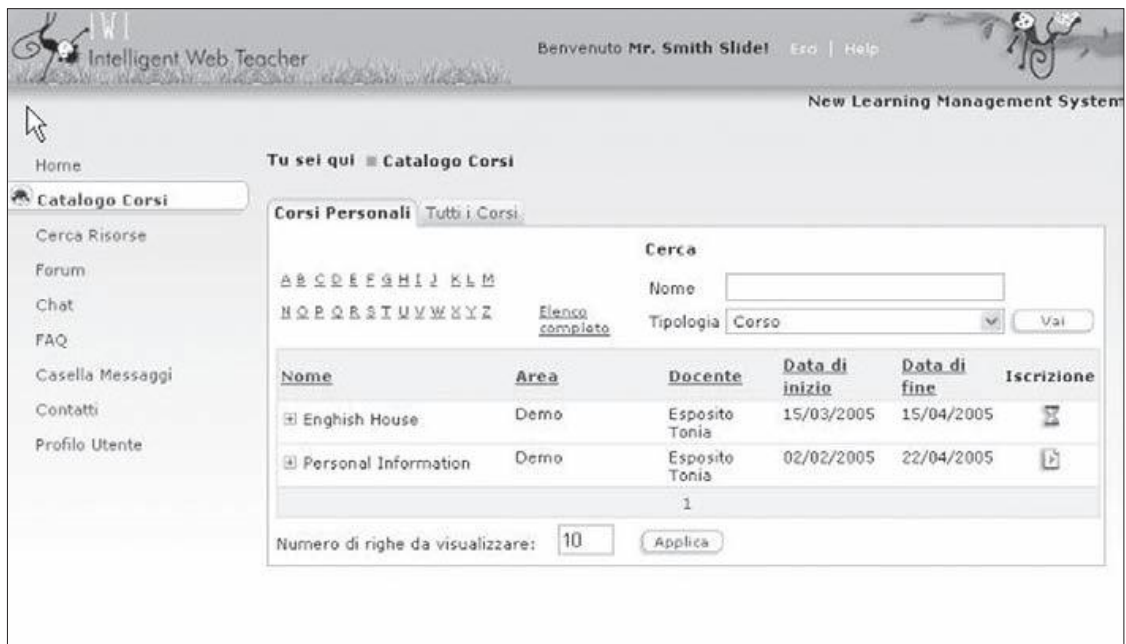
Figure 1   IWT interface.

increasing the efficacy of IWT by gathering and elaborating students' feedbacks and by including them into the development of the platform.

The research was aimed at letting students' point of view emerge about their e-learning experience with the platform and their assessment of it. This type of study fits well to research connected to cultural psychology (Bruner, 1990; Cole, 1996) that strives to change the way categories of analysis are built (Crapanzano, 1986). Some (Moore, 1998; Pike, 1954) proposed a juxtaposition between ethic and emic perspectives. Ethic conveys the researcher's point of view; emic represents the point of view of the participants who are no longer simply subjects. By using the term «participants» a more active role is allotted to the people observed. Their point of view is relevant and often contributes to make consider research as a whole. For example, Grossen (1998) found out that by asking children to play the role of the researchers, their representation of what the research was about emerged and did not overlap researchers' intentions. Emic categories seem also able to contribute to describe the social representation of tools and artefacts. In our research, emic categories (we call them «topics») have been built starting from students' utterances.

4. Thinking aloud sessions

Four university students (two of them worked in dyad and produced one protocol), from 19 to 23 years old, volunteered to be trained for thinking aloud sessions while using the platform at the university lab in Salerno. These students

were taking the on-line course offered by some professors of the Engineer degree. Some face to face sessions were organized, monitored by an expert of the platform, to support the students on using the platform. The thinking aloud protocols were gathered during one of these sessions.

The study session during which protocols have been collected involved in total two groups of about 15 students using IWT courses. Out of the 15 students, four of them volunteered to participate as thinkers aloud. Around half an hour was needed to complete one thinking aloud session. Two researchers monitored all the sessions. Students were provided with detailed instruction reported on a sheet they were required to study and discuss with the research in advance. In the sheet it was clearly stated that they had to say anything that crossed their mind, even if it seemed to be stupid or misplaced. They have been also warned that a constant flow of talking was expected since it is impossible not to think. They have been suggested to start by describing what they were doing, what they were aiming, and what they were not able to do. Further advice and suggestions were given in order to be sure that the voices were recorded (for example to stay close to the computer and not to get distracted by other things happening around). No supplementary informations have been required to the students and they all seemed to understand how to manage the performance.

While students were using IWT a software installed on the computer recorded their voices. For this purpose they used headphones and microphones.

5. Results from the thinking aloud protocols

The thinking aloud protocols have been analysed using Discourse Analysis in order to find how meanings were organized and what type of topics emerged in the discourse in the use of the e-learning platform (Sacks, 1992; Schegloff, 1992).

Protocols obtained were informative and different in terms of narrative styles. The first one had short and incisive sentences; the second one was more interactive because it was produced by two students working in dyad and for this reason contained many questioning-answering; the third one was more narrative with long and complex sentences. Besides the differences in the narrative style, we found a convergence on the topics included in the protocols. Two independent researchers read the protocols, looking for emic categories able to describe the experience of being an e-learner. By combining the three protocols the following list of emic-topics was found:

1. no engagements on interactive environments;
2. focus on learning contents;
3. «fuzzy» representation of certain functions;
4. platform as an «extension» of the professor;
5. technical problems as impairment for full exploitation;

1. No engagements on interactive environments

Many comments were found on the protocols which indicated students did not care about the interactive environments available in IWT. For example, from the protocol 1 we extrapolated the following excerpts:[5]

I don't go to the mailbox at all because .. usually there are no messages
The chat is even worse
I don't like the chat at all

Students were not engaged in interactive environments for two possible reasons. First, a proactive tutor with the task of deliberately selecting topics and promoting discussions was not present. In fact teachers used IWT almost exclusively to upload contents, giving few comments about them. No specific training was given to teachers to build skills in creating community and social networks. An IWT tutor was available but she played the role of giving technical informations and solving troubleshooting concerning the platform.

Second, both the mailbox and the chat space were quite simple and no educational value was assigned to them. For instance, the no-chat meetings were scheduled to discuss the course, not the assignments.

Both these areas need to be redesigned to be more appealing from both the social and the educational points of view.

2. Focus on learning contents

The real interest of the students was focused on contents:

what I am interested in is just the simple course of math 4 (Protocol 1)

In protocol 3 student considers the platform mainly as an environment where he can find didactic materials. In fact, after solving a small problem related to his log to the platform, he says that IWT:

to consult material is quite clear (Protocol 3)

Right after he complains about the lack of exercises:

exercises, we need more practical exercises (Protocol 3)

This vision well matches with the scarce interest on the interactive environments.

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[5] Protocols are originally in Italian and they have been translated into English by the authors of this paper.

This topic can be explained by considering that e-professors were not very focused on pedagogical aspects like managing and developing an online community. Obviously, they did not sufficiently consider the specific communicative and educational opportunities offered by an on-line course. IWT was used simply as a kind of repository for lessons and contents, without really taking advantage of other possible uses.

Regarding to this, we suggested that teachers' expectations should be re-addressed when organizing the educational material. This is an aspect that does not concern the platform but rather teachers' representations of the platform.

3. «Fuzzy» representation of certain functions

The student producing the protocol 3 makes an interesting comment:

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FAQ… I have no idea about what that is (Protocol 3)
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A similar utterance also came up in protocol 2:

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What's a FAQ? (Protocol 2)
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In fact, the interface never explains (neither in English nor in Italian) what a FAQ is; it was taken for granted that students would know it. Another interesting comment along this line is recorded in protocol 1:

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send a message …to whom…???? I don't know (Protocol 1)
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The student is dealing with another function not explained in the interface. Again it was taken for granted that it could be understood by the students.

As we already noticed, these students show low interest in interactive environments. One of the reasons for such an attitude could be that they don't know how those environments actually work. For example in protocol 3 we found the following comment:

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the bad thing is that messages are always recorded
… everybody can read them, there is no privacy (Protocol 3)
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When chats record the interactions, usually users are notified. In the case of IWT this does not occur: whatever users type in, it is lost when the chatting session is closed. Students seem to fear to write something that teachers can dislike and they, cautiously, prefer not to publicly expose their thoughts.

This topic, which well aligned with topics 1 and 2, proves the lack of technical, as well as pedagogical, training in the use of the platform. This aspect concerns

both students and teachers. Probably, by explicitly explaining to teachers how important certain functions are and how they work, a cascade effect on students could be expected. Of course, a direct training addressed to the students about the technical and pedagogical functions of the platform would allow a richer representation of the platform as a learning tool as well as a social virtual place.

4. *The platform as an «extension» of the professor*

Students often talk about off-line activities and about their professors. The platform seems to be perceived as an extension of the professor's actions. Most of the student's navigation in the platform is aimed at searching new materials or exercises up-loaded by the professor.

The platform is perceived as an environment mainly at the service of the professors to complete their didactic intervention. In particular, a comment retrieved in protocol 3 seems to confirm this hypothesis:

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…the four parts of didactic materials, I guess it reflects
enough the program explained in class (Protocol 3)
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Unfortunately, we lack detailed informations about how the platform was perceived by the teachers. What we know is that they made great effort in organizing the pedagogical material in an ontology, as the platform required. We suspect that they lack a pedagogical vision of how on-line courses can be used. In fact, although constructivist principles were pursued by the developing team, we have no evidence that teachers were informed about those principles and how they, as teachers, could implement such principles when organizing the course.

In the particular case of the courses taken by these students, we know the classroom course runs parallel to the on-line activities. Students could either enroll to the course long distance and take classes in-person at the same time, or they could only take the on-line course. No clear difference has been identified. This may lead toward a flatter vision of the platform, perceived as just a place to retrieve the same material presented by the teachers in the classroom, regardless of whether students attended the class or not.

5. *Technical problems as impairment for full exploitation*

Protocol 2 gives us a few hints about how technical troubleshooting was experienced by the students.

Some students reported difficulties in downloading documents, especially when they don't have a proper connection:

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at home documents are too big ( (Protocol 2)
if you don't have broadband it's quite difficult (Protocol 2)
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Another problem was related to the size of the windows where the didactic material is visualised:

Don't you think the window for content visualisation is too small? (Protocol 2)

Even users' subscriptions could be impaired by technical problems:

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do you know I wasn't able to enroll? (Protocol 2)

This type of difficulty forced one of the students to not up-date his profile (a long interaction is recorded in protocol 2 about this problem). As a consequence of such missed update, the intelligent adaptation of IWT could be compromised.

Technical support was available in the platform but students did not seem inclined to use it. The reason for this attitude could be easily related to the limited engagement they show towards interactive tools (see topic 1). Consequently, a passive vision of themselves as users is consolidated: their action is limited to searching for materials up-loaded by the professor and the usability of the course is not considered to be something changeable but rather as given and not modifiable.

6. Recommendations for software developers and educators

The topics described here have been encountered in all of three protocols. Their consistency tells us that these topics ought to be quite important for the students. Moreover, they seem to be connected to each other. In fact, the low investment on interactivity (topic 1) is compensated by a strong focus on learning contents (topic 2) and this latter point justifies a perception of the platform as an extension of the professor (topic 4). Another reason that fosters topic 1 may be that students do not always know how tools work. In fact, we found that many options available in the platform were not fully understood (topic 3). Finally, the technical problems encountered (topic 5) foster topic 3.

The analysis of the thinking aloud protocols allows a set of recommendations to both software developers and educators. These recommendations may apply not only to the specific case of IWT but also to any e-learning experience at the university level.

6.1 Enhance the use of interactive environments

Students should be encouraged to use chat and forum. In order to reach these targets, technical aspects as well as social and educational potentialities of these tools should be clearly explained. We cannot say students are properly knowledgeable to this regard. From a recent survey Livingstone (in press) performed in the

UK emerges that the young generation uses the internet just to acquire information and fails to explore its interactive potential.

Students should be aware that in these environments a horizontal (between peers) communication can be developed. Students could compare their experiences and they could learn from each other by making comments on how they participate to the on-line activities.

Nevertheless, teachers as well should have a specific training not only about how to organize the didactical material but also about how to put interactive educational tools. Even if teachers know technically how to use chat, forum and emails, it cannot be assumed that they know how to integrate these tools into an educational platform.

Some kind of introduction of how, when and why interactive environments can be used should be available in the platform. Moreover, on-line tutoring seems to be crucial for an educational use of interactive environments. Tutoring can also be gradually distributed amongst the students. The ability of covering tutoring functions should be considered as part of the learning process and as an indicator of the success of the course (Ligorio, Talamo & Simons, 2002).

6.2 More explicit interface

Software developers seem to imagine a user more competent than the one actually using the platform. Students often fail to know abbreviations. They don't understand English and therefore they do not grasp the meaning of many words in English, included into the menu. Short demos may be useful to foster a full utilization of the platform.

 Teachers also should be aware that their students may not be able to understand menu and tools. They may provide specific guidance in this respect.

6.3 Enhance active students' on-line participation

Students perceive the platform as an extension of the professor, thus they feel the platform is there only to collect didactic materials, to download exercises, to retrieve the schema of the course. They don't think the platform as a place where they could be active. A peripheral participation can be recognized (Lave & Wenger, 1991) but it needs to be sustained and pushed toward the centre of the practice of learning. Perhaps some preliminary informations about what e-learning is and what it means to navigate through an e-learning platform may be useful. Regardless the content of the courses, it may be useful for students to be instructed in e-learning theories and methods.

Thus, we suggest decreasing the use of the platform as a repository of educational materials (this can be done also off-line) and the planning and implementation of activities that allow students to perform some kind of action. In this way

technical problems deplored by the students could be solved so they may spend more time interacting each one other and forming communities.

Again, teachers may need to specifically trained in this respect. In fact we suspect that a certain students' vision of the platform may just mirror the teachers' vision. The correspondence between students' and teachers' perception of the course cannot be proved in this study, but other research showed that the learning process is envisioned by students according to the teachers' approach (Trigwell, Prosser & Waterhouse 1999). Thus, teachers should receive a specific training about the pedagogy embraced by the platform and how it can be best implemented during the preparation of the on-line course.

7. Conclusions

In this study we analysed three thinking aloud protocols produced by four university students (two of them working in dyad) while using IWT, a web-platform designed for e-learning. From the results we gathered emerges that students perceive the platform in a rather passive way: they show low interest on interacting with both peers and teachers and they perceive the platform essentially as a place where to find didactic materials and exercises. We suppose one of the reasons determining such results is the lack of teachers training on the pedagogical view that fosters the platform. In fact, in order to fully take advantage of the potential of an e-learning platform we believe it is necessary to train teachers under the pedagogical point of view and not only under the technical point of view. Teachers should be more aware of the educational approach afforded by platform as well as the pedagogical scenario within which the platform is used. For instance, students taking exclusively the on-line course need different support compared to those following also the course in presence. This type of training may even lead to a re-organization of the face to face course, in this case a more complex educational vision should be considered.

Furthermore, from the thinking aloud protocol we understand that students' computer skills are not as reckoned by the developers. In fact, students seem to need explanations about how the interface works, what certain menu-options mean, and specific support to interact on-line is advisable. Students revel a feeling of uncertainty when they are on-line that seems to be not fully expressed and, thus, totally neglected. Knowing more about how students feel when they log-in it may be useful to improve e-learning theories by taking in consideration the role of e-learners: What it is expected they do when they log-in an e-learning platform? How can the platform sustain their presence in the virtual environment offered by the platform? And what students know about e-learning? Are they aware that new learning skills would be advisable or do they simply transfer to e-learning the learning strategies they usually use without computer?

These questions could be addressed by giving students more information about what it means to be an e-learner. Generally students have very little familiarity in using internet for educational purposes; in fact the web is often perceived as informations storage, as the Livingstone (in press) report shows. To change this view a specific effort is needed from both software developers and educators.

Furthermore, we believe the active construction of a student-identity can reinforce learning (Ligorio & Spadaro, submitted). We also know that specific tools play specific roles in supporting an identity as learner in virtual spaces (Hermans, 2004; Ligorio & Pugliese, 2004) and this is possible only under the condition of having tools supporting dialogue. Thus, by giving the possibility to build an on-line dialogical identity a better definition of what an e-learner is could be fostered.

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