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Social software, learning and education: new ways to *look at* and *work with* the classroom

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Abstract
Social software brought profound implications on how the user interacts with the Internet. More than a way to transmit content, the Internet emerges as a platform where the user creates, processes and shares content with the community. Social software, by facilitating the processes of communication, interaction and group creation, fosters the development of new learning environments characterized by participation and sharing, where the community becomes a locus for the construction of knowledge.
In a context where the use of Web 2.0 tools can be considered a way of nurturing interaction and participation in a community, the study described in this paper analyses the use of a specific set of tools by the students of the Master in Multimedia in Education (University of Aveiro, Portugal, 2006/2008).
Considering the analysis of the contribution of Web 2.0 tools for the creation of a learning community in the Master in Multimedia in Education (2006/2008 edition) as a primary aim, this study also intends to identify the motivations behind the use of these tools by the students.

In spite of some reservations, the analysis shows that the existence of a learning community in the Master in Multimedia in Education - 2006/2008 edition - was real: the ability to share, the collaborative work and the openness to interaction within the group are mentioned as the main reasons for the use of the Web 2.0 tools. Although limited to the specific context of this edition of the Master course, the findings of the study presented may be useful for the planning of future approaches where the integration of technology in educational contexts is intended.

1. Introduction

With the development of social software, the Internet became a platform where content, rather than transmitted and consumed, is created, shared and negotiated. By emphasizing the contribution of the user in creating and organizing information, the network becomes a place where knowledge is socially constructed and shared, reflecting a human and social dimension where networks of people, data and services grow towards a connective and innovative environment (Bryant, 2007).

In an environment where learners are encouraged to take responsibility for their own learning and where knowledge is seen as a process created and negotiated through social interaction, social software can reshape the traditional model of knowledge transmission, leading to changes in the way individuals think (Solomon and Schrum, 2007). The network (re)defines itself as a field where the frontiers of creativity can be expanded and where each student assumes growing responsibility for his/her own leaning.

Presenting a case study developed between 2006 and 2009 that focused on the use of blogs and wikis as collaboration tools, this paper discusses the use of social software in a Higher Education course, describing how web 2.0 tools were integrated in a Master Degree class. Students' opinion about the role of social software in scaffolding collaborative learning activities is also addressed, as well as their perceptions regarding the existence of a learning community in the Master Degree course. It is argued that social software can have a deep role in changing the traditional education paradigms, promoting the creation of more collaborative, interactive and meaningful learning environments.

2. Social software and learning: new ways to *look at* and *work with* the classroom

How users interact with the Internet changed in ways that had a profound impact in the field of education. In these new setting, students look at schools as places that support the creation of learning communities, places where they can learn to learn, where creativity and innovation are cultivated (Anderson, 2007) and where they develop learning abilities and new skills possible to be used throughout their life.

In an environment where technology is a part of everyday life, students begin to think, work and enjoy themselves in ways different from the ones experienced by previous generations (Solomon and Schrum, 2007). The participatory web emerges as a place where knowledge is discussed and shared, fostering the development of communities that encourage and enhance the collaborative capabilities that already exist in individuals (Hargadon, 2009) and where students and researchers are encouraged to design their own curriculum. The community becomes a place where members also learn how to coordinate, support and guide other

members, where they learn how to take responsibility for managing their own learning, and to build and share new knowledge.

Social software changed education in ways that go beyond the simple adoption of tools and technology. It changed the way people (educators, students, researchers) think, share, connect and co-create knowledge, challenging the traditional model where information is transmitted and tested. By providing the basis for the construction of a new approach to learning, it transformed the traditional landscape and pushed education towards new approaches based on collaboration and articulation between individuals and communities.

When knowledge is seen as something that exists in the networks created and maintained by the users and learning is seen as a social activity, education can slowly but firmly move away from a teacher-centred model (Downes, 2008; Siemens, 2008). In this learning landscape, social software can offer a major contribution in changing work, learning and communication methods by bringing deep contributions to the way people create and interact with technology.

In classrooms, text-based web tools such as wikis and blogs can be used to promote interaction and collaboration, fostering collaboration between teacher, students and outside experts. Wikis can be used to encourage students and teachers to explore and share different areas and perspectives of knowledge. By using wikis, students can be encouraged to go beyond the publication of content, learning not only to publish but also to develop collaborative competences and to negotiate meanings, a process that implies the adoption of new ways of looking at education (Richardson, 2006). Beyond its social dimension, blogs can contribute to enhance competences related to writing, learning and discussing in communities, offering both teachers and students the ability to encourage more responsible writing and the opportunity to establish more advanced connections (ib, 2006). Blogs and wikis, as other social text-based web tools, can promote the development of critical thinking and conscious reading and writing and, at the same time, foster relationships between peers, teachers, mentors and specialists.

The adoption of social software can, therefore, have a deep impact in schools and learning, bringing deep changes in the way individuals think, share and work with each other. The next section will present the main lines and conclusions of a case study developed at the University of Aveiro (Portugal), describing how the adoption of social software in a Master Degree class changed the way students looked at the technology and to each other, and how it has contributed to the development of new ways of looking at and work with the classroom.

3. Social software in Higher Education: a case study

In the 2006/2008 Multimedia in Education Master Degree (MEMD) – University of Aveiro, Portugal – the adoption of Web 2.0 technologies went beyond the curricular dimension, materializing a vision of the Internet as a collaborative platform. Structured as a blended-learning course – with face-to-face sessions at the beginning and at the end of each course module, interspersed with three weeks of online work – the MEMD course embraced the Web 2.0 philosophy, adopting its tools and incorporating them in its structure and communication processes.

In the Communication Technologies in Education (CTEd) class – one of the course modules – students faced a challenge: a task designed as an assignment that could only be solved with the commitment and collaboration of everyone. The class goal – planning and implementing an Online Education Center to support students in their study – required students to engage in

deep collaboration and interaction, as the different tasks (planning and designing facilities, selection of materials, Internet access and hardware selection) were distributed among different groups of students. Moreover, while aiming to promote more collaborative work models, the lecturer gave students the clear indication that all work and research should be developed based on coordination within and between groups, a strategy based on jigsaw teaching sessions (these sessions are described by Brown (1994) as a version of Aronson's jigsaw rooms, where collaboration and negotiation between students are required to the resolution of the proposed activity).

The need of more open and flexible communication models led to the adoption of blogs and wikis as discussion and knowledge negotiation platforms, while a social bookmarking tool (not analyzed in the study) was used to collect and organize, in the same shared space, all the resources found by students in their research. As the selected tools were not integrated in the institutional LMS, all content published and shared was visible to anyone and not only to those who had institutional credentials, allowing the participation of and discussion with people from within and outside the class.

Each of the five groups was responsible for the creation of a blog, a space where they would publish all the discussions, strategies and findings, in order to be discussed by the whole class. All groups contributed to the same wiki, the tool chosen as the best place to build and publish preliminary and final reports.

In order to understand the reasons behind the selection and adoption of the previously mentioned tools, as well as to obtain a deeper understanding of the lecturer's goals and expectations, the study included an exploratory interview with the CTEd lecturer. The interview allowed the collection of information regarding his opinion about the success of the adopted strategy and his thoughts about the existence of a learning community in the MEMD course.

According to the lecturer, as a deep collaboration was imperative to achieve the class goals, the promotion of more open and flexible communication models led to the adoption of a set of Web 2.0 tools specifically chosen to foster interaction between the different groups. Blogs were adopted as a way to increase participation and discussion within and between groups, allowing an interaction not possible to achieve by using traditional LMS forums. Wikis were adopted as the best way to share, in a transparent way and at any time, the work developed by the different groups, and a social bookmarking tool was used as a way to systematize and aggregate, in a single shared space, all different resources found by the community throughout the course.

3.1 Research design and methodological approach

The integration of Web 2.0 tools in the MEMD course brought deep changes to the way lecturer and students looked at and worked on the Internet. In order to describe how social software was used and integrated in the MEMD course, we developed a case study aiming to analyse the role and importance of Web 2.0 tools for the promotion of new approaches to teaching and learning, as well as to analyse their contribution towards the development of a learning community.

3.1.1 The research question

Taking the question "did the adoption of social software by the MEMD students' contribute towards the creation of a learning community?" as a starting point, the study was articulated around four main axes: (1) the identification of the Web 2.0 tools most used by the students; (2) the identification of the reasons that supported that use; (3) the analysis of the lecturer's

role as a inspiration for the adoption of web 2.0 tools and philosophy by students; and (4) the analysis of the perception and impressions of the students about the role and importance of Web 2.0 in the creation of learning communities.

The study included both quantitative and qualitative analysis of the messages published by the twenty students of the MEMD course in the Web 2.0 tools selected, as well as the study of the opinion of the students themselves, collected through a questionnaire and an online focus group. The case study analysed the participation of all twenty MEMD students, over a month, throughout the CTEd module.

3.2 Research Design

The following "action plan" outlines the actions and research techniques/instruments used to collect the data required to answer the research question.

Goals	Actions	Research technique/instrument
Identify the Web 2.0 tools most used by students	Analysis of the use of each tool, based on the quantitative analysis of the participation in the blogs and in the wiki, and the analysis of the data collected through the questionnaire and the online focus group	Direct observation Questionnaire Focus Group
Identify the reasons that supported the use of the Web 2.0 tools selected	Analysis of the data collected through the questionnaire and the online focus group	Questionnaire Focus Group
Analyse the lecturer's role as an inspiration for the adoption of web 2.0 tools and philosophy by students		
Analyse the perception and impressions of the students about the role and importance of the Web 2.0 in the creation of learning communities		
Main goal: Identification of the contribution of Web 2.0 tools for the creation of a learning community		

Table 1 – Action Plan

Data related to the use of the selected Web 2.0 tools was collected through **quantitative and qualitative analysis of the 358 posts and comments** published by the twenty students in all the five group blogs.

To analyze the messages published by students, different interaction analysis models were considered: Gunawardena et al., 1997; Salmon, 2000; Rourke, 2001; Philips, 2003; Murphy, 2004. Given that the focus was placed on the study of the interactions and collaboration between students, Murphy's Analysis Interaction Model (2004) was used to analyze the messages published. Messages were, therefore, classified under one of the following categories: (1) social presence – sharing of personal information, recognizing group presence, expressing feelings and emotions; (2) articulating individual perspectives – statement of personal opinion or summarizing

content making no reference to perspectives of others; (3) accommodating or reflecting the perspectives of others – challenging statements made by others, introducing new perspectives, sharing information; (4) co-constructing shared perspectives and meanings – asking for clarification or feedback, provoking and responding to questions, sharing advice; (5) building shared goals and purposes – propose and/or work towards a shared goal; and (6) producing shared artifacts – production of documents or artifacts by group members working together (more information related to Murphy's model can be found in Murphy, 2004:426-427).

A **focus group,** with the participation of five MEMD students (one student per group), was conducted in order to analyze the perception of students about the existence of a learning community, the role of the lecturer as a changing agent and the role that each Web 2.0 tool played in the construction of the community. Finally, students were asked to fill in a **questionnaire**, which aimed to collect data about how students adopted each Web 2.0 tool, identify the reasons that supported the use of the different tools and analyze their role in the construction of learning communities.

3.3. Findings

Although more than 50% of the MEMD students were not familiar with most of the Web 2.0 tools at the beginning of the course, all groups engaged in the collaborative task proposed by the lecturer, sharing their knowledge and resources in blogs, wikis, and through social bookmarking tools.

3.3.1. Web 2.0 tools as collaborative platforms

As mentioned above, data related to the use of the selected Web 2.0 tools was collected through the analysis of the posts and comments published by the twenty students. While quantitative analysis of the posts published evidenced the involvement of the students (there was an average of 17 messages per day published in the group blogs), qualitative analysis showed that the group went beyond the simple exchange of information and entered a dynamics of collaboration, interaction and knowledge exchange. More than 45% of the messages published in the group blogs were classified as "*co-construction of shared perspectives and meanings*", evidencing the potential of this Web 2.0 tool in promoting discussion and interaction between individuals and groups, and in nurturing the construction of collective knowledge.

Social presence	Articulating individual perspectives	Accommodating or reflecting the perspectives of others	Co-constructing shared perspectives and meanings	Building shared goals and purposes	Producing shared artifacts
146 (41%)	47 (13,1%)	17 (4,7%)	162 (45,3%)	51 (14,2%)	13 (3,6%)

Table 2 – Collaboration, interaction and knowledge exchange: analysis of the posts and comments published by students according to Murphy's Analysis Interaction Model (2004)

3.3.2. Social software in CTEd: why and what for?

When asked about the reasons why they used web 2.0 tools in the CTEd module, students (both in the focus group and in the questionnaire) emphasized the role of the blog as a

discussion and interaction tool. The collaborative design of the tasks proposed, the desire to share and the interaction within and between groups are mentioned, in the questionnaire, as the main reasons for the adoption of social software in the class.

When requested to reflect about their experience as Web 2.0 tools users, 95% of the students agreed that the use of these tools encouraged shared and collaborative work, and that its use added dynamism and interaction to the working process. Students also mention that the use of Web 2.0 tools contributed to a more responsible awareness when publishing contents. 60% of the students concurred that group competitiveness – fostered by the openness of Web 2.0 tools – was relevant to increase the quality of the whole project.
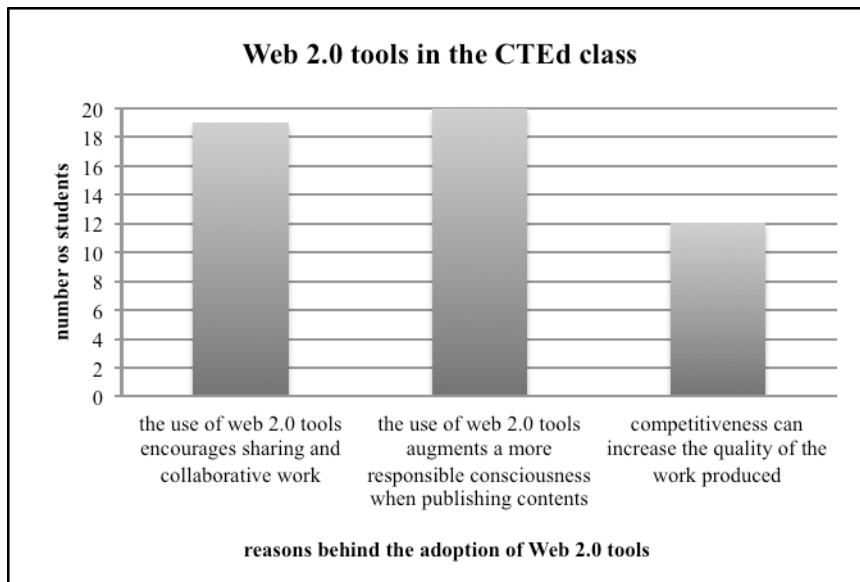

Figure 1 – Main reasons behind the adoption of Web 2.0 tools

Blogs were used as a space where students could share and interact with each other (within and between groups), where they could maintain a log of all activities available to other groups and therefore ease the discussion and collaboration inside the community.

The wiki was adopted to allow students to track and analyze the work that was being developed by different groups. The data collected trough direct observation showed that the CTEd wiki (collaboratively constructed by all students) was edited 1173 times, while the answers given by students in both the focus group and the questionnaire revealed that the wiki was used to publish preliminary and final reports, encouraging more careful and conscious writing.

3.3.3. Tools, teacher, task

During the focus group, students mentioned the lecturer's commitment and enthusiasm as vital to their own enthusiasm. According to the answers given by students, the enthusiasm of the lecturer – himself a social software user – when talking about, showing and working with the tools, was one of the main motivations to overcome the initial fear and stress:

"Were it not for him, there would be a lot of things that I wouldn't know by now." *(participant E)*

"I say this that because he knew how to use the tools, and because he talked about his own experience with the tools he induced us to use them too." (participant B)
The collaborative and interactive nature of the task proposed by the lecturer was also pointed out as something that supported and fostered the adoption of social software:
"We all participated, but why? Because we had to, if we wanted to achieve the final goal, we were required to." (participant D)
Students mentioned that such a collaborative task would be impossible to accomplish by using the traditional ways and channels of working and communicating. They also established a deep connection between the nature of the task, the goals of the class and the indications of the lecturer as reasons for the adoption of social software in CTEd.

3.3.4. Social software and learning communities
The focus group had as its main goal to grasp the perceptions of the students about the existence of a learning community in the MEMD course. Although mentioning that the first contact with Web 2.0 tools and respective philosophy was overwhelming and a little disorienting, students considered the intensive use of tools as the best way to overcome resistance, as well as to achieve effective collaborative learning:
"From the moment we have to work in groups, it becomes a starting point for the creation of a learning community." (participant A)
"The best communities are those which are born spontaneously, the ones we search for when we want to participate and are interested in." (participant A)
Enhancing the role of the lecturer as a dynamic agent, students stressed the importance of teamwork, of deep collaboration, of group interaction and the existence of social and human bonds as important dimensions of the course.
When questioned about the existence of a learning community in the MEMD course, the participants agreed that the community was something real, highlighting the prevalence of interactions, the exchange of experiences and collaborative work as the main evidence for sustaining such statement. This idea of community was also mentioned in the questionnaire by 80% of the students: the sharing of information, the collaborative work and the prevalence of social and academic bonds that continued beyond the end of the course were mentioned as indicators of the existence of such a community:
"What started as a group may have ended as a learning community." (participant A)

3.4. Conclusions of the case study
The case study presented in this paper had the main goal of analyzing the contribution of Web 2.0 tools towards the creation of a learning community. The analysis of the collected data revealed that social software was used by students to communicate, interact and, by doing so, achieved the CTEd class goals. Blogs were used as a platform for communication and sharing information between groups, and the wiki was used as a place to build and deliver preliminary and final reports. The qualitative analysis of the posts published in blogs also showed that students worked together towards the construction of shared meanings and knowledge, which may reveal the potential of this tool for fostering interaction and collaboration.
When asked about the reasons for the adoption of social software, students referred the desire to share, the possibility to interact and the immediacy of communication provided by web 2.0 tools as main reasons for using it. Students also made salient that the attitude of the lecturer, his enthusiasm and example as a social software user were fundamental to encourage the adoption of the Web 2.0 tools and philosophy.

The creation of a leaning community is not an easy process, and neither is the measurement of its existence. Even so, the analysis of the data collected showed that students engage in working processes that lead to collaboration, interacting within and between groups in order to accomplish the class goals. Although circumscribed to the MEMD course, the study showed the importance and relevance of social software when promoting new collaborative and interactive learning models. Web 2.0 tools could, therefore, be adopted in order to promote the creation of learning experiences that expand the learners' horizons towards a more dynamic, adaptive and social learning experience.

4. Discussion

By fostering communication and allowing the sharing of ideas and experiences, social software nurtures the emergence of a new learning model focused on the learner and built upon the interaction between community members. In a model where participants are actively responsible for the construction of their own knowledge, the community emerges as a source and a place for exchanging experiences and as a place where knowledge can be shared.
This new way to *look at* and *work with* the web is, however, seen by some institutions as a risk as opposed to a new way to teaching and learning. Intellectual property (Lamb, 2004, Solomon and Schrum, 2007), the uncertainty about the quality of the work produced by a large community of users (Gorman, 2007) and the openness to the community may be some of the reasons behind the resistance to adopt social software in the education field. Even though, the risk is worth taking: Web 2.0 tools can offer a major contribution towards changing work, learning and communication methods, bringing sound contributions to the way people create knowledge and changing the way people interact with technology.
There is, then, an urgency to reconsider traditional education models, moulding them into new approaches based on collaboration and articulation between individuals and communities:

> "Blogs, wikis and other open, collaborative platforms are reshaping learning as a two-way process. Instead of presenting content/information in a linear sequential manner, learners can be provided with a rich array of tools and information sources to use in creating their own learning pathways" (Siemens, 2005:26).

5. Conclusions

By adopting new collaborative models, schools can get closer to transforming themselves into environments capable of preparing students for the world, inviting and showing them how to discuss, understand and co-construct knowledge suitable to be used throughout their lives. This paper analysed the adoption of a set of Web 2.0 tools by a group of Higher Education students, describing how social software might promote deeper and more collaborative learning models, when compared to traditional learning management systems. Although circumscribed to a specific edition of a Master Degree course, the findings of the study showed that the adoption of Web 2.0 tools – capitalizing on the already existing student's interest in the use of those tools – may promote the creation of learning experiences that expand the horizons of the learners towards a more dynamic, adaptive, fulfilling and social learning experience.

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