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HOW TO PROMOTE EFFECTIVENESS IN TERMS OF TIME IN NETWORKING PROCESSES

Maria Pérez-Mateo[1]
Montse Guitert[2]

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Universitat Oberta de Catalunya (Spain)
[1] mperez-mateo@uoc.edu
[2] mguitert@uoc.edu

How to promote effectiveness in terms of time in networking processes

ABSTRACT

Because time is present in all learning activities it is important to consider how to optimize it. This is even more important in e-learning given the virtual student profile, most of them adults who do not have time. A tool that seems to favor time management is the wiki. The aim of this article is to analyze how the wiki can favor efficiency in networking processes. The general context is the "ICT skills" course by the Universitat Oberta de Catalunya. Starting from a qualitative methodology, the paper analyzes how students working in small groups carry out a virtual project through a wiki. In terms of encouraging effectiveness by using a wiki in a networking context, data show that it is important to consider three elements: the time required to learn how the tool works, organizing the process and optimizing usage of the tool. The paper provides some key elements along these lines.

KEYWORDS

Networking; Time factor; Wiki; e-learning; Virtual project.

1. INTRODUCTION

The internet facilitates collaborative work and networking. More and more proposals try to facilitate the acquisition of skills through collaboration and teamwork among students. Following Anklam (2009), it is important to differentiate between collaborative work and networking concepts. In her own words "It boils down to whether the emphasis in the network is to make connections to *share* experiences, contacts, ideas; or to collaborate, engaging in activities to *produce* something. It's not an either/or, of course. Web 2.0 has made us aware of the vitality of that comes from socially-generated content – comment streams on blogs, activity streams in microblogging, and so on – which can be precursors of collaborative activity". In this paper we deal with networking processes in a learning environment.

A key element of networking processes is the time factor. As Bullen (2010, in Bates *et al.*, 2010) states, learning, by definition, requires time. Indeed, the time factor is present in any learning activity. This fact is even more evident in a virtual environment, an environment which exists independently of the time factor, ensuring flexibility in the learning process (Bates, 2010, en Bates *et al.*, 2010). According to Barberà (2010:13) "this "temporal dimension in e-learning" is considered as a real tool which is always present and which spreads out into the planning and implementation of online education".

Although good time management is crucial for the good functioning of online learning (Barberà, 2010), in practice this issue is often forgotten. Furthermore, students waste time in developing learning processes, especially when they work in groups, because they rarely have guidelines in this respect. That is why the time factor is becoming more important due to its influence on teaching – learning processes (Gros *et al.*, 2010).

There are currently different tools which may facilitate and improve joint learning in a virtual environment. That is the case of the wiki. This tool also seems to be a good choice in order to promote time management. A wiki is a collaborative website that can be edited by multiple users and consulted through a history of actions (Bruguera & Gil, 2008). According to Deumal & Gil (2009), the wiki allows to create, modify, edit, link or delete the contents of an electronic document easily and quickly. Wikis do not aim to regulate self-publication but rather to structure a set of information through successive new contributions. It therefore becomes a work in progress which is continuously being added to (Deumal & Gil, 2009).

As noted by Barberà (2009), the wiki may be one of the most "academic" tools among those related to web 2.0. That is why studies on its educational use have recently increased[1]. According to Martín & Alonso (2009), wikis enable students to construct their own learning through interaction with the environment as well as with other students participating in the wiki, producing a real exchange of knowledge. Creating in a wiki involves editing together, adding to information by peers and supplementing or modifying it according to common learning objectives. Wheeler *et al.* (2008) state that wikis enhance the architecture of participation.

Research in this field shows that wikis have the potential to improve the collective construction of knowledge in academic contexts (Elgort, 2007; Raman, Ryan, & Olfman, 2005) and achievement (Robles *et al.*, 2009). However, some studies (e.g. Cole, 2009) show that not all experiences developed through wikis are positive, while further exploration is required in this area. Indeed, experts stress that it is a complex virtual tool (Giménez & González, 2009; Raman, 2006).

In terms of the time factor, in this paper we try to address how wikis can facilitate networking processes when students work in small groups.

2. METHODOLOGY

This study focuses on how wikis can promote effectiveness in a networking environment from the point of view of the time factor.

We adopt an interpretative methodological approach to supplement studies of the time factor, which are mainly based on a quantitative approach (Reimann, 2009; Gros *et al.,* 2010).

In keeping with the interpretative paradigm, we adopt a qualitative point of view that aims to "understand people" and to interpret the point of view of social players. The study also takes some quantitative issues into account.

Specifically, we have used the case study (Stake, 1998, Yin, 2003) as an approach for our own study.

Starting from the general objective, we deal with the following research questions:

❯ *What elements can promote effectiveness in the context of networking?*
❯ *How do wikis facilitate time management when students construct knowledge together?*

2.1. SCENARIO

The educational environment which becomes the general scenario for our research is the Open University of Catalonia (UOC[2]). The UOC is a fully online university with a Virtual Campus where all learning activities and communication take place. Its aim is to facilitate lifelong learning.

Within the UOC, our study is carried out on the "ICT skills" course. This is a cross-curricular course common to all UOC undergraduate programs. For this study, students from Computer Engineering and Psychology were involved.

"ICT skills" aims to initiate students in the use of ICTs for learning purposes and to gradually support the development of a specific competence defined by the UOC: the "Use and application of ICTs in academic and professional development". The recommendation is to take this course in the first semester of the online program, when students first come into contact with the learning environment.

The "ICT skills" course allows students to develop knowledge and skills for a responsible, efficient, informed and productive use of digital technologies. The students on this course form small groups of 3 to 4 participants. The methodological approach for the course is project-based learning (Railsback, 2002). Students choose a topic of interest related to their discipline at beginning of the course. This subject is then discussed and collaboratively developed throughout the learning process. As a result of this process, each group carries out its own virtual project. As they carry out this process, students progressively acquire ICT skills.

Groups use a wiki as the main tool to produce their content. We chose the wiki as a tool that fosters interaction in content creation, as well collaboration within a shared and openly accessible digital space, and because it provides an architecture for participation (Wheeler *et al.,* 2008).

In this study, the 14 rooms of the "ICT skills" course for Computer Engineering and Psychology were involved. The average number of students is 60.

2.2. DATA COLLECTION AND ANALYSIS METHODS

Different data collection methods were used in order to provide in-depth overall knowledge of the reality under study, combining interactive methods of data collection (i.e. semi-structured interviews and a questionnaire) with non-interactive methods (such as group observation). These instruments complement each other, thus ensuring the holistic nature of the data analysis and providing a basis for their triangulation and the validity of the research procedure.

The observation was carried out in the rooms involved. Specifically, 4 rooms (two per program) were chosen in order to observe how students built their projects through the wiki. Within the classrooms, just teacher boards were analyzed. Through the teacher board, the teacher can offer guidelines, monitor the process, give advice, etc.

Among the four classrooms, different small workgroups were chosen as the specific analysis context. The choice of these teams was based on two main requirements: that the group should develop a successful dynamic in relation to the course objectives and should use the wiki to carry out their virtual project. Finally, 6 groups of Computer Engineering (3 per room) and 1 of Psychology were chosen. Each of them had their own UOC online working space composed of the following: Teacher board, Debate, File area, Wiki and Chat.

In order to complete the data from the observation, some individual semi-structured interviews were conducted with 14 students (two per workgroup), trying to focus on their perception of the group processes. Some of these questions also focused on the use of tools in order to acquire ICT skills. We also interviewed the teachers involved in the process (4 teachers).

An anonymous online questionnaire was also created in order to analyze the group work processes as well as the tools and the teacher's role. With the objective of collecting as much data as possible in order to support findings beyond the 4 cases, the questionnaire was sent to all classrooms (14) of the selected studies and answered by 192 students. The questionnaire was voluntary, anonymous and non-assessable. This research is based on two of the questions referring to tools: an open one and a closed one.

For a cross-sectional analysis we also used triangulation for the complementary nature of the data collection instruments used and contrasting data and players.

3. RESULTS AND DISCUSSION

Networking is characterized by the use of virtual tools that convey all the actions carried out. Networking is also based on asynchronous communication. These conditions highlight any need for repair in these tools: what elements should be taken into account, what their possibilities are and how to optimize them.

The data analysis shows that, in order to promote the effective use of wikis in networking, it is important to consider the following issues regarding the time factor: the time required to learn how the tool works, organizing the process and optimizing tool usage.

3.1. THE TIME REQUIRED TO LEARN HOW THE TOOL WORKS

According to Raman (2006), although wiki literature highlights the usability of the tool, practice shows that this may not be immediately intuitive. Indeed, it appears that:

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ISSUE 3 · Intelligent Networking: New Opportunities for Effective Time Management in e-Learning Settings | ISSN 2013-7966

❯ It requires learning; i.e. to find out what a wiki is and what its possibilities for networking are. One student stated in the questionnaire that "*The wiki seems like a good initiative, but it wasn't accepted as a whole. Probably because it requires some learning*". Another member stated "*we were very slow because we weren't familiar with it*".

❯ It requires time. Most of the groups that were unable to use the wiki or used it below its potential referred to the lack of time as the main cause. One student said in this respect "*we were very slow because we were not used to this tool*".

❯ It may be seen as difficult in terms of its usability. One interviewee said: "*Had the editing in the wiki been easier, maybe we would have done better. (…) I thought the tool was a little complicated to work with… to write there*". In the case of a group that used the wiki intensively, some aspects perceived as complicated were carried out by using text documents. In this vein, a student writes in the Debate: "*I have extended the planning that we had already begun in the wiki (…) Because I did it as a table, I don't know how to insert it in the wiki. So, you will find it in our File area*". Even though some groups worked with the wiki in order to carry out their work, they demonstrate this factor in the following comment: "*I personally won't use the wiki again because it is very complicated*".

Data show that there is a key element that influences their perception of the tool; the time spent learning how the tool works and its ease of use. Under the same conditions, and with the same guidelines and available tools, just one Psychology group worked with the wiki. On the other hand, all Computer Engineering teams included this tool in their work processes, albeit with different objectives in mind and, in some cases, edited only by one member. It is clear that Computer Engineering students are more likely to work with new tools than Psychology

ones. Predisposition in the use of the wiki is therefore related to the student profile.

In any case, given that, for many students, using the wiki was a "**new experience**", it is important to plan an initial period of time in order to learn how it works and its potential. Indeed, all students involved in this experience reflected how the wiki was an innovation. One student even admitted that previously he "*did not know what the wiki was*".

3.2. ORGANIZING THE PROCESS

Planning and organizing individual and group work are important skills that students bring into play as a part of the course. In terms of the time factor, organizing the process before it's carried out becomes a key factor for both group and process success.

Previous studies have highlighted the relevance of organizing and planning the process (Guitert, Romeu & Pérez-Mateo, 2007). This study reveals the testimony of a group who emphasized the "*planning task*" as a key element to overcoming the obstacles occurring during the process.

In a networking environment, it is important to take into account the relevance of developing the skills required to organize group work; i.e. to take decisions associated with the process. At the same time, this will also promote time management. Below there are some issues related to initial networking organization from our classroom observation:

❯ The communication channel and how it will be implemented.
❯ How to use the different tools and each one's function.
❯ The information management process.
❯ Anticipation of conflicts, overlaps, etc.
❯ Establishment of roles related to promoting the process: animator, organizer, etc.

❯ Planning the process though activities and delivery dates (schedule).

It is also important to encourage preliminary organization so that this becomes a tool for carrying out the process. Guiding this stage, a teacher suggests: "*Be realistic and practical, taking into account what you have to do and which is the best way forward*". Another teacher highlights "*the relevance of planning in order to succeed*".

In addition to the initial planning, teachers encourage groups to review their initial planning and organization as an instrument for the group. As one teacher says: "*As you progress in the project development, you should review and assess the group work process: communication and interaction, organization, information management, attitudes... So you will be able to make the appropriate adjustments*". Another teacher observes: "*I see that some of you groups are going on to the Final Project but at a slower pace than is advisable and more slowly than you planned yourselves, and I suggest you revise your planning*".

3.3. OPTIMIZING TOOL USAGE

For effective exchange within a networking environment, it is important to know how to use the tools available. In this area, data show that wikis facilitate time factor management as they help to optimize the process.

Specifically, data suggest that the wiki optimizes three key networking processes: the interaction between members, the organization and management of the process and knowledge construction.

A) Interaction between members

Interaction processes form the basis of networking. Students develop both group processes and skills through this interaction. However, for this to happen it is important to work on communicative skills and enhance their effectiveness. The data show that wikis can facilitate and optimize interaction between members in a group.

In some cases, students used the wiki as a space for exchanging opinions or discussing specific aspects of the project. A student reflected this feature when he claimed they had used the wiki as "*a forum that everyone can edit (...) the wiki was like a dynamic board that could be modified*".

Taking this fact into account, the wiki was also used from time to time for communication related to the social dimension, mainly in terms of asking for help and encouraging participation. In this respect, one student writes: "*I'm doing a test. Does anybody know how to use the wiki effectively and create our forum space for working?*" Another student says: "*I don't know what I can write here guys! Let's see if someone has any ideas ;-)*".

The data also show how the wiki fosters communication effectiveness while lowering the volume of interaction. Comparing the use of the wiki and debate for discussion, one student commented: "*In the debate you have messages like... "I agree", "I also agree"... You have many messages but no content. In the wiki you have few things but they are ideas so you save opening a lot of messages*".

Finally, the wiki facilitates the organization and localization of content ahead of decision-making. A student argues about the use of wiki: "*I realized the potential of the tool because... in the debate area, one person proposed a title for the project, another one added another thing, but that stays there... so when you access the group's debate area in order to get an idea of the titles that we've been discussing... I have to go through all messages and check them all by opening them one by one*".

B) Organization and management of the process

Another key issue in networking is the participants' ability to organize and manage the process as it develops.

Students point to the wiki's potential in order to control and monitor the process as it "*allows the group to be organized in a different and attractive way*". In this respect, one student noted in the questionnaire that the wiki was useful as "*a scheme of the work done and the work pending*". Another student referred to how, from the beginning, he tried to encourage his group to use the tool: "*For example, in relation to tasks... I listed the tasks and I noted with asterisks or with an "x" what we had to complete and I said: put your name down next to the tasks that you prefer*". Finally, a student said: "*In the debate you have to write down and to see, for example, which titles there are, how many times they have been rated... But in the wiki all the content was reflected or summarized*".

A very important use in relation to project management was the management of information generated in the process, because it helps to "*share the information immediately*". In this sense, we distinguish three related functions:

❯ The possibility to quickly and easily control different versions of the project. In the words of one student, the wiki becomes "*a powerful tool in terms of control*" because it allows you "*to add and modify content knowing who did it and when*". Indeed, it helps to modify "*just one document instead of taking it, modifying it on your computer and updating it again*". At the same time, the wiki also fosters content edition and update.

❯ As a digital information repository; in other words, to access, store and share the information generated during the process. As one student says, the wiki makes it easy to have information "*available, so you can quickly consult it. If you had a doubt it was easy to check it. In a document you had to look for it. And if you make a change everyone sees it immediately. You don't have to download it*".

❯ The display of content. As one teacher comments: "*work is seen immediately (...) and it is more attractive*". At the same time, as noted by a student, the wiki has more possibilities because "*if you preferred to, you could see the history of edits, or if you preferred, you could see the result*".

C) Knowledge construction

Another important skill developed by students on the ICT skills course is the construction of knowledge. As the data show, the wiki can improve this process given that it becomes its main function. The wiki becomes a space for "*working with the information*". Groups valued the tool as very positive, stating that "*the use of the wiki makes work easier*", making the process effective.

The wiki encourages the collaborative development of information given that it is "*accessible to all members*" and editable, promoting interaction and collaboration (Toker et al., 2008). Therefore, as Barberà (2009) stressed, the wiki tends to prevent participants from writing in parts, bringing them closer to a common reading and writing, taking into account that the group works "*on a single document and all of them can work on it directly*".

The wiki reveals the process of content production because content is shared as it is created. A student wrote in the Debate area: "*I'm doing some things and, instead of saving them on my PC, I put them on the wiki. In this way, you can see it too*". This fosters networking, through suggesting, sharing, participating, assisting,... the content development process.

It also helps to make changes to each other's contributions in the construction process (Giménez & Gonzalez, 2009). Given that all members know who is working on what and how, it becomes an important factor in terms of the effectiveness of the process, avoiding misunderstandings.

Related to the construction of knowledge, students stress the importance of the wiki as an organizer of ideas and content in order to facilitate decision-making. One interviewee said, in this respect, that the wiki had been very useful in *"reaching agreements (with brainstorming, for example)"*. He also referred to this usefulness as follows: "*Who is in charge of this task? He is… Which titles do we have? These ones… so it seems we have this title repeated several times, maybe this will be the one*".

4. CONCLUSIONS AND PRACTICAL IMPLICATIONS

Bearing in mind the findings presented above, we conclude that the time factor consistently appears in virtual teamwork dynamics and, as a result, has significant implications in developing online activities and the learning process.

In this paper we have analyzed how carrying out a virtual project through a wiki within a networking group may favor the acquisition of key skills associated with the virtual environment: interaction, organization and planning and construction of knowledge. In addition to managing these skills, the wiki enhances effectiveness in terms of the time factor.

However, it is important to consider two prior elements in order to use the wiki efficiently and thereby optimize time management. On the one hand, planning an initial phase in order to learn how the tool works. On the other hand, spending some time organizing the process as well as the

tool; i.e. how students will achieve the objectives and which role the tool will play in this.

These results have noteworthy implications for educational practice.

First, we should stress the need to put into practice those skills associated with online interaction in order to develop networking processes. Indeed, encouraging teamwork development skills will facilitate and promote participation in informal networks as well as communication and more extensive knowledge construction.

Second, to promote the effectiveness of the networking process, the pedagogical approach should provide an initial period in which users learn how the tool works. It might even be positive to develop an informal activity to introduce students to its use. This is especially important for some specific student profiles, e.g. those of Psychology, who are less predisposed to using the wiki and less proficient in the use of ICTs compared with Computer Engineering students.

The pedagogical approach should also allow a period of time to organize the group dynamics: how to use the tool, how each resource will be used, whether someone will be responsible for certain tasks or functions, how information will be managed, what key elements will be taken into account in the interaction process, etc. Indeed, the more elements that are anticipated from the start, the more effective the development. Considering these aspects of the process during its development will also become a key element in acquiring skills in a networking context.

Finally, encouragement and teacher guidance are important issues in order to acquire key networking skills. Teachers can also take advantage of the wiki for monitoring and assessing the group process. Indeed, it helps

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them to quickly visualize the status of the activity and to see to what extent each member is contributing (Giménez & González, 2009; Montenegro & Pujol, 2009; Trentin, 2009; Martin & Alonso, 2009). As one teacher argued, "*the best of all is you know exactly what everyone has done*".

Although, in this study, we analyzed the use of the wiki to carry out a virtual project in a networking environment, it is important to note that each tool has specific functions. So teachers should assess which ones are the most appropriate for each objective.

According to these elements, and within the context of the Digital Training Area at the UOC, we created a guide for using the wiki as a tool for carrying a virtual project in groups. It will also be important to analyze how teacher guidance and monitoring affect the time management factor.

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Footnotes

1. Among others, see: Elgort, 2007; Elgort, Smith, & Toland, 2008; Montenegro & Pujol, 2009; Parker & Chao, 2007; Ramanau & Geng, 2009; Trentin, 2009; Vratulis & Dobson, 2008; Zhang & DeLoose, 2008.

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