University training in virtual work. An experience with virtual teams

Sebastián Steizel
Universidad de San Andrés
Vito Dumas 284. Victoria Provincia de Buenos Aires. Argentina (B1644BID)
ssteizel@udesa.edu.ar

Luisa Mayoral
Universidad Nacional del Centro de la Provincia de Buenos Aires
Campus Universitario (7000) Tandil
mayoral@econ.unicen.edu.ar

Abstract:

There is a frequent assumption that new generations, born and raised surrounded by new technologies of information and communication, have assimilated the necessary skills to work effectively through virtual means. However, experience shows that the education system still exposes new generations to a socialization process strongly based on face-to-face education and with scarce training in virtual environments. This article presents a collaborative experience with more than 70 students, teamed up in 15 virtual groups, and from different Argentine universities. Some of the difficulties of distance learning are the problems of sharing contextual information, building trust, dealing with conflict, and upholding work interaction and communication that is focused on a group task. Educational devices that aim at developing skills for distance learning for university students are analyzed.

Keywords: distance learning, university education, virtual teams, competences.

INTRODUCTION

Information and Communications Technologies (ICTs) have changed –and are still changing- the way we work, the way we study, the way we think and the way we interact with others. In this sense, ICTs are a powerful driving force of change [1].

These transformations have an impact in the labor market, not only in creating new ways of working and communication, but also in redeveloping skills. Some of these are related to individual abilities and knowledge, but many others require a change in the way we create social bonds and interact with others. In the first case, research indicates that success is not particularly connected with computer skills but with writing and analytical skills [2]. Regarding relationships; communication, conflict management and trust building skills have been identified as key competences [3]. Thus, developing these abilities involves cognitive aspects and also interpersonal skills unrelated to explicit learning. This is usually a tacit knowledge, not necessarily connected with formal education, more closely related to a "know how" than to knowledge in the strict sense. The way we learn these skills is basically through practice in the workplace [4].

There is an important ongoing debate about university training of employees for this new reality. On the one hand, some authors have suggested that new generations regard technology as a natural phenomenon, wholly incorporated to their everyday lives. This new generations, often called "Digital natives" [5] or the "net generation" [6] prefer active learning, and are able to execute multiple tasks and depend on technology for their interaction [5, 6, 7]. However, this viewpoint has been criticized because the use of technology and the skills it requires are not as uniformly spread as it is presumed, and because the extrapolation of these everyday skills to the work and learning fields is not easy [8].

On the other hand, distance learning entails a series of special features of collective interaction that need to be understood. In a face-to-face interaction, where they usually have common past experiences (shared experiences -

they know each other-, and knowledge of the context where they work, -its culture, performance standards, etc.-), people get together, they re-cognize each other, they work and monitor their progress together; social control mechanisms emerge, etc. Many of these elements manifest themselves differently in the case of distance work, and not everybody shares the many assumptions about the task, the members and the organization that are brought about. Also, these teams work on the basis of "different" parameters in terms of time, interaction and personal skills which need to be learned.

This paper identifies and analyzes the special features of work in distance teams and draws a series of conclusions that can contribute to the development of these skills within the field of university education. It is the result of an exploratory research experience of a quasi-experimental nature in different universities. The article is organized as follows: in the first part the main concepts related to distance learning and the problems associated with this modality of education are introduced; the second part presents some ideas connected with experience-based learning that are key to understanding the purpose of the experience we present, and the third depicts the methodology used. Lastly, the main findings are analyzed and conclusions for skills development are drawn.

THEORETICAL FRAMEWORK

In the field of education there are multiple perspectives to approach the study of dispersed teams or, as they are also known, "virtual teams". The "distance learning" scholarly corpus would be the most predictable avenue to explore. But an approach that closely draws on the Administration Sciences contends that, given certain basic dimensions, face-to-face groups can be taken as a reference against which virtual groups can be analyzed. A new and currently growing approach in the field suggests that "virtual groups" can be problematized as an object of study that can be analyzed in itself and not by contrast to any other formation. Drawing from this last perspective, two main dimensions will be dealt with: virtual teams and virtual learning environments.

Virtual teams

Virtual work is a modality where people share a common objective and carry out tasks independently, in different places and times, using technology as their main means of communication [9]. To fully understand the challenges faced, the special features of this modality need to be identified.

Cramton [9] explores the implications that invisibility has in virtual work, and emphasizes the need to elaborate situational explanations. In the same vein, Sproull and Kiesler [10] argue that communication through ICTs greatly reduces social context cues that give messages a specific meaning. When many of the elements of the social context that are important to communication become uncertain, as happens with the use of electronic mail; social cues weaken and relationships are more difficult to establish. This difficulty depends, in part, on a failure to understand the situation (work, context, emotional, etc.) lived by the other party, thus degenerating in the attribution of wrong causes to a certain behavior [9].

Other authors focus on understanding conflict in virtual teams. According to Hinds and Bailey [11], technology sets a limit to the amount of information that can be transmitted, and also increases conflict and imposes the additional difficulty of the need for coordination of the behavior of team members. Hinds and Mortensen [12] found that there is more personal conflict in a virtual team, compared with a collocated team. Accordingly, and because face-to-face conflict management strategies cannot be extrapolated to distance situations [13], these conflicts become critical to virtual teams and their resolution does not lie within known parameters. The authors suggest accounting for the moderating effects of shared identity and shared context, as well as generating mechanisms of spontaneous communication.

Distancing himself from the handling of specific conflicts, Walther [14] contends that although virtual teams may show high levels of performance, these teams need a longer time to develop and to reach a balanced form of interaction than face-to-face teams.

Finally, many authors also posit the need for face-to-face meetings in order to create the necessary empathy for an effective performance [15]. However, when the composition of virtual teams include subgroups with members that share a location, these members show a better relationship with their close colleagues than with the more distant

ones, although same nationality groups show higher levels of conflict and lower levels of trust than totally dispersed groups [16].

In conclusion, compared with traditional work, virtual work entails different special features and it is essential to identify, understand and assimilate them to ensure more productive performances. The simple extrapolation of face-to-face work dynamics can generate misunderstandings, conflicts and problems that are very difficult to revert once put into motion.

Learning in virtual environments

Theories that deal with practice learning, such as Communities of Practice theories [17], can be useful to understand learning in virtual environments that is meaningful to students. At the risk of incurring in simplifications, these geographically dispersed groups, mediated by a computer, can be considered as "communities of practice" in the sense of Wenger [17] and can be analyzed using a model of learning based on participation. They are a community that shares a mutual commitment, a common practice and a shared repertoire of symbols. Developing as a community entails the need for the teams to find their own dynamics based on collective practice. A dynamic relation between the individual and the group action generates the knowledge about how to manage interaction in this environment, and this process builds collective learning about how to operate in virtual teams.

Thus, skills are learned in practice, based on collective action and a reflection process about this practice because the way behavior becomes meaningful is through practice. The characterization of groups as learning communities where learning develops through practice transforms the work experience in a learning experience. Accordingly, a considerable portion of the research about virtual teams is devoted to the study of distance-working university students [18, 19], not only as a means for the analysis of virtual teams, but also as a way of developing these students' competences [20].

METHODOLOGY

A laboratory experience was designed where students were asked to develop an academic task, with the aim of understanding the existing skills of university students to develop working routines in virtual contexts, and analyzing emerging problems. The task entailed the creation of inter-university work groups, and consisted in the joint resolution of a case study through the use of a technology platform.

Two such experiences have been carried out: the first one, from April to June 2009 with students from a private university located in the north of the city of Buenos Aires and a public university located in the center of the province of Buenos Aires, in Argentina. A total of 71 students participated in the experience, and they were distributed in 15 randomly assembled teams of 5 to 6 members, where each team had a balanced representation of both universities. The second and somewhat more ambitious experience consisted in a similar setup with students from a private university located in the north of the city of Buenos Aires, a private university in Bogotá, Colombia, and a private university from Montevideo, Uruguay. In this case 156 students were teamed up in 27 randomly assembled groups, where each team had a balanced representation of the three universities, and was carried out from August to November 2009.

The experiences were designed in detail, and professors agreed on the planned activities, from a pedagogical and a research-oriented point of view.

One of the first stages of the design process consisted in the coordination of work agendas with all universities involved, the topics that would be covered, and the choice and design of the e-learning platform. Six common core topics were chosen. The technology used was the "Moodle" platform, which allows for the assembly of the teams within the system and the use of such tools as discussion forums and chatrooms for synchronous and asynchronous

communication. This platform was new to all universities involved, thus requiring from professors as well as students some time to become familiar with it.

Once these first aspects were agreed upon, a case study was chosen and a handbook was written, containing the work schedule, responsibilities and evaluation criteria. The case was "TBE in Quilmes Industrial S.A.: Work based on self-managed teams"[1], not only because it presented a myriad of topics related to Organizational Behavior studies, but also because the case dwelt on self-managed teams and provided the opportunity to reflect on the experience in itself.

Also, several key deadlines were set. During the first week of access to the platform and assembly of the groups, each member was required to introduce him or herself to their fellow team members. The aim was the creation of empathy between members and sharing of information relevant to their collaborative activity. In week five every group had to present a succinct report on the topics they would analyze and the rationale for this choice. Here, the purpose was to have the team produce a document to expedite the work schedule and to have a landmark that entailed their need to interact with each other. Then, another five weeks later (and after receiving feedback on this report), each team was required to present a 20-page diagnosis and analysis of the case. Finally, to wrap up the activity, each university organized a face-to-face session to analyze, reflect on and extract conclusions from the experience, as a way of generating knowledge useful for the students and for future similar experiences.

The students were instructed to conduct all of their communications through the virtual platform, while no outside intervention would be allowed. This restriction was introduced to allow the faculty to monitor the development of work, each students' interventions and, eventually, to access the communications records and analyze group performance for research reasons.

This article draws on various sources of information. First, a statistical analysis of the participation of team members was carried out, followed by a qualitative analysis of the messages exchanged between the students. This allowed not only tracing the frequency of the messages but also their contents and an analysis of the lived experience. Later, the information gathered from the assessment meetings with the students was added, and a reflection on the work dynamics was developed.

This article will account for the findings from the first experience, as it is so far the one that has been analyzed in detail and that was shared by the authors.

FINDINGS

In what follows the main findings of the experience will be presented in an orderly and straight manner, although the experience was complex, diverse, systemic and chaotic. The following topics will be particularly analyzed:

- Participation, non-participation and pseudo-participation
- Shared commitment, diverse commitment, ritual commitment and non-commitment
- Technology as a facilitator and an obstructer of group processes
- The task and the emerging conflicts
- Results from the task and from the group dynamics
- Emerging issues

Participation, non-participation and pseudo-participation

The analysis was made on the amount of active and passive participants, the amount of messages exchanged, their time distribution, and also more qualitative aspects such as complexity and diversity of ideas, and the emergence of different roles.

According to these variables, the 15 teams that participated in the experience can be grouped into 4 categories:

[1] Kort, Graciela and Ariel Kievsky (2007). "TBE en Quilmes Industrial S.A: trabajo basado en equipos Autogestionados". Universidad of San Andrés, Buenos Aires, Argentina.

1. "The" team: It is named as such because it was the only team with these features. Here, active participation is complete. There are no "*lurkers*", those passive students who only observe but never interact and that when the deadline approaches, *de-lurk* by appearing and giving their support to what was done by the group. With this team, the amount of messages is above average: over a theoretical average of 37.6 messages for all teams, this team's messages total 94, thus being the group with the highest level of interaction when measured by amount of e-mails. Time distribution is balanced, so there are no high and zero interaction periods but it is sustained all along the experience. Content analysis shows that each message is minded and answered by the rest of the team; and no e-mail is answered with silence. Answers are given within a 2-day frame, and e-mails generate chains of answers. The participants' roles are clearly defined: beginners, followers, information providers, synthesizers, etc., but they are not fixed and change with the implementation phase. There are no dysfunctional roles.

2. The "quasi-teams": These are 5 and characterized by a high active participation. However, there are *lurkers* (one in most cases; two in one case). In almost all cases, the amount of messages is above the average amount (37.6), and in all cases, they are above the median (33). Time distribution is generally balanced, but it is affected by *lurking*: some participant does not reply, the group waits, then becomes restless, starts working, complains with the faculty and requires intervention, and finally ignores the *lurker* and resumes working, in the same way as "the" team. Rules need to be redefined in this truncated team: despite working with fewer members, they work as a team, with a high level of interaction and quality. Answers are given within a 2-day frame, and e-mails generate chains of answers. Different members begin, synthesize, analyze, etc., and role exchange is fluid. *Lurkers* access the platform and keep informed on the group's progress, but they do not interact with their fellow members. Closer to the deadline there is a *de-lurking* process: a greeting to the team, apologies, poor excuses and compliance with the work already done by the team. The team accepts the member, but waits expectantly. In general the new participant does not contribute too much, but the team nevertheless formally includes him or her in the presentation, although in a few exceptional cases this does not happen because the participant drops out from the course.

3. The "groups": These are 6. Their level of participation, measured in amount of e-mails, is below the theoretical average and, in the best of cases, it equals the median. Only one of the groups does not have *lurkers*; in the rest, these silent participants are ubiquitous. Also, in many groups there are students who drop out from the course. The *lurker* is accepted when he appears by the end of the semester, but only as a formality. This is enough for the new participant. It is a ritual action. However, the group is upset, and the messages reflect this and their feeling of the injustice of the situation. Again, and just like the "quasi-teams", the active members become restless, then wait, complain, and finally accept, not without annoyance. Communication sometimes flows and sometimes is nonexistent. There is no cadence. There are timely and untimely answers. There are no chains of e-mails. Messages are sometimes lost in silence. Feedback is bad. When messages are not answered, they are sent again, to see whether the rest of the members are still there. There are periods of uncertainty. Silence is interpreted as lack of interest. Frustration is followed by hope when the answer and the apologies arrive, but, again, frustration overflows when silence returns. It is a very slow moving group dynamics that becomes evident through its difficulties. Roles are blurry, expectations are unclear and, in general, the whole experience is lived as a nuisance.

4. The "pseudo-groups": These are 3 and characterized by a very low level of participation. Messages are basically ritual. They do not progress. Participation is lower than the minimum required. In every one there are *lurkers* and dropouts. In some cases the passive participants outnumber the active ones. There are 3 groups but each show their own profile: one of them never acquires a mixed identity, because two of their *lurkers* come from the same university. For the active participants, who come from the same university, virtual work becomes absurd. In the second group one of the participants carries the whole burden, in view that the rest of the members are either dropouts or *lurkers*. Finally, the third group presents the lowest interaction levels, with two active participants, two *lurkers* and three e-mails.

Shared commitment, diverse commitment, ritual commitment and non-commitment

It is clear that the type of commitment in terms of intensity and quality changes from group to group and within the same group. Understanding shared commitment as a desired feature, for the cases we analyze here in general terms this element has proved scarce.

1) Shared commitment: Only one of the groups, which we identified as "the" team, shows this feature. Not only has the level of commitment been constant in time, but it has also been marked by enthusiasm, challenge, pleasure over duty and a rational cost-benefit calculation.

2) Diverse commitment: This is typical of the "quasi-teams", where there is an occasional shared commitment, but not always between all members. Also, internal reasons for commitment are varied: for some members it is enthusiasm; for others, duty; and, lastly, other members decide to take more or less part in the activities according to a personal equation.

3) Ritual commitment and non-commitment: There are also cases of ritual commitment, based on form and not on substance, cases of minimum commitment (i.e., the least necessary for the group to consider peripheral participation as "legitimate"), de-commitment and non-commitment. Although it is possible to connect these behaviors to "pseudo-groups" and the least developed groups, the reality is more complex and varied. Different styles and modalities coexist within the different types of groups.

Technology as a facilitator and an obstructer of group processes

A reflection from a socio-technical point of view, regarding how the platform's technology can facilitate or obstruct interaction, can also be advanced here. Despite the efforts made in the design stage to make technology a facilitator, several problems emerged from the experience. In this sense, two interesting issues arose: 1) at the beginning or at the moment of the introductions; and 2) during the process of working on the case.

1) Technology at the beginning: Students evinced technology-related problems from the outset, although the platform was created on "Moodle", a well-known tool, and several tests were carried out to guarantee its smooth running. This is particularly relevant for the students who come from one of the two universities. Almost half of them do not have home access to the Internet, so that requires that they resort to an internet café or the university premises if they want to work in a timely manner with the group. Also, many of the students from this same university state that the enrollment process was not easy, that knowledge of English was a limitation, and that overall, the website is not friendly. When they were asked about their use of technology, the students would claim that although they are familiar with videogames, chatrooms and cell phones, such is not the case with these kinds of platforms, and that they not always know how to write an e-mail correctly. The instance of introduction results in a very succinct and formal knowledge of the other members of the group, where no contextual information is exchanged.

2) Technology when working on the case: Initially, all communication is asynchronous and established via e-mails. At the event of silences, waiting and nonattendance, students resort to synchronous communication through the chatrooms, with which they are familiar. This step generated a common feeling of frustration, because chatrooms were slow and in various occasions the connection spontaneously dropped. In view of this problem, many decided to use other chats (Hotmail service or SMS via cell phones), but this meant that their interaction remained outside the faculty's reach and was not recorded. In the end, the students were allowed the use of other chatrooms (but not SMSs) on condition that conversations would be recorded and sent to the faculty. This represented a "patch" solution; we cannot be certain about how many groups conformed to this requirement. The analysis of these conversations follows the same patterns as with the groups that used asynchronous means.

The task and the emerging conflicts

The analysis of the development of the assignment and team dynamics shows that a good portion of the time and energy are spent on coordination issues. In most of the cases interaction lacks substantive exchanges about the analysis of the case, and it is focused on agenda coordination, apologies and complaining for a want of participation.

Whenever information about the analysis of the case is exchanged, contributions are either individual or by subgroups (members from the same university), and are accepted without further inputting or questioning.

In some cases, the degree of boldness and hostility of the messages is striking. Complaints, channeled in part through the faculty, derogatorily stereotype "the others". In other cases, these messages are posted in the discussion forums. The following extracts are an example:

"GUYS! I'm so angry! G. and J. have done nothing so far, and that's unacceptable. I'm angry that I have to work for others and that others are getting my mark. So, sorry, but we won't upload our assignment in moodle. I hope this is not a problem for the professors. I'm sorry, but this is university and, as in life, nobody will do things for you" (M., Group 14).

"C., you've got a nerve, really! Not only you never showed up, or helped or said anything, YOU DIDN'T WRITE THIS PAPER, I put your name on it only because I'm good, but you know you never did this. And on top of everything, you go and post a message on Monday and say you did a part of the culture section, that, anyways, YOU NEVER UPLOADED! I don't know what your problem is; lucky me, I have nothing else to do with you now" (A. T., Group 8).

"Can somebody say anything? It's a group assignment and nobody makes a single comment… I won't do it on my own! Get down to it, we need to complete it" (F., Group 15).

There are practically no interventions regarding the contents of the progress made. In general, a student with a higher level of commitment will take on the responsibility for completing the task and integrating the work already done, showing a higher or lower degree of opposition.

Results from the task and results from the group dynamics

Results from the work itself are striking: all groups (thanks to, independently of, in spite of) their internal dynamics, turn in the assignment in a timely manner. Assignments differ from one group to the other in terms of quality and value, but there is no correlation between assignment and group features. The star team did not obtain the highest mark. Many middle groups obtain similar marks. Other groups, as the pseudo-groups, are equally able to pass. In general terms, individual marks reflect an even more diverse outlook. By all means, if conclusions had been drawn on results only and the faculty hadn't had access to the group dynamics at the time it was taking place, we would have believed that groups were working perfectly well.

Regarding ex post satisfaction, results are not uniform, and this is a relevant element of analysis. In those groups characterized by a fluid communication, a sense of commitment and interaction, members congratulate each other and celebrate the results obtained. Their farewell e-mails show enthusiasm and rejoicing. Some members promise to keep in touch. For problematic groups there is no leave-taking: somebody turns in the assignment and here ends all communication.

We personally asked the students how they assessed the experience on the whole. Those who worked on their own felt angry and frustrated. Paradoxically or not, *lurkers* were enthusiastic: some of them end up acknowledging their calculating behavior, but only after being explained that the faculty "was watching". Would they recommend the experience to next year students? Students from the provincial university are positive, while the Buenos Aires City students would not recommend it. With exceptions and nuances, thus the experience ends.

Emerging issues

Although almost all findings are emerging, some of them were absolutely impossible to foresee. These are related to the differences shown by both universities, the variety of the students' situations faced with the experience, and internal complaints.

By all means, the faculty and the authors of this paper belong to different universities: on the one hand, a public, small university from the interior. On the other, a private university from the capital, not big in size but prestigious.

In the first case, students access the public university because they belong to the same location or area of influence. In the second, students either invest money in their education or resort to a scholarship system, where their grade point average plays a crucial role.

Although these differences had been acknowledged beforehand, some of the consequences entailed were unexpected:

Technology availability, in terms of devices and skills, represented the first difficulty. We did not foresee that for some of the students from one of the universities, gaining access to a computer connected to the Internet would be so hard. Although this service was available on campus, the university was unprepared for this additional surge in demand; Internet cafés were an alternative, although inadequate for academic work; some classmate could help, but this was not a complete solution. Additionally, almost all students found it difficult to familiarize with the platform. The belief that all students would feel at ease with the platform proved wrong.

The second emerging difficulty was what social psychologists call the "otherness", where some groups of students questioned their "partners in the experience". They contended the requirement of working with "other" people who came from a university that had nothing to do with them. Thus, these students did not enroll in the platform and kept a watchful attitude. Not only were they not motivated by the reasoning about the possible enrichment of the learning experience, but more and more students began to agree with their view. A partial solution came with the Academic Council approval of the experience, but, for some, this validation entailed that biases were at work.

When the experience began, a large amount of students from one of the universities (with the exception of the previously noted cases) noticed that their classmates from the other university were taking the initiative. They told themselves that they would be the followers and go with the flow. For them, this was just an assignment. This was also the case for their distant classmates, although in many cases their scholarships were at stake. So, motivation was diverse. This explains much of the behavior adopted later and can be associated to a calculating position, with clear repercussions in styles of commitment. An idea slowly developed with most of the students (with the same exceptions), that could be worded as follows: "they…take everything in their path" and "those guys…are just opportunists".

ANALYSIS

An analysis of the experience is highly interesting and can represent an important contribution for distance work experiences.

Regarding different degrees of participation, this modality allows students to enter and exit the team work with no apparent social cost (or without conscience of it). A feeling of invisibility affords some members the opportunity to handle an intermittent participation and to offer all kinds of excuses that the rest of the team deem more or less plausible. This is possible due to the lack of contextual information of the other student's situation, and also, because there is a certain "feeling of solidarity" within each university's subgroups.

When there is no contextual information (or an acknowledgement of this information) the student that does not participate, even due to valid reasons, can "let the others" do the job without the need to explain his or her behavior. Accordingly, the rest of the team is left to imagine the reasons, which are connected with the social imaginary or stereotypes that grow stronger with the experience and end up generating conflict. For example, the fact that some students had Internet access problems could be taken by them as "evident" (which excused their need for explanation), whereas for the rest of the team the feeling of "see how they are?" gained more and more ground. Thus, this lack of information about each member's individual context generates misunderstandings that drag the team toward unproductive work dynamics.

Emerging dynamics are moderated by the formation of alliances within subgroups. These are created along the process of generation of a common idea about how the others are. The subgroups end up covering their own backs, which behavior also affects the performance of the group as a whole. Thus, the specific identity of the face-to-face subgroup prevails over the team's identity and commitment. This explains the dynamics of those teams where the behavioral pattern was a fragmented participation, repeated excuses and absence of group functioning.

Technology-mediated communication also creates a feeling of de-individualization. Interaction with unknown people or people with which we don't normally interact, together with the fact that there is no face-to-face contact can sometimes make people say things they would not normally say in a face-to-face situation. There were no strong complaints within each university against local classmates, whereas several complaints were raised against students from "the other university", which increased the conflict level. Several messages show how explicit and non-academic this conflict became. This behavior can be certainly explained by distance, invisibility and de-individualization.

In view of these situations it is interesting to analyze the relationship between results in terms of the assignment and in terms of team interaction. How can such a weak correlation be explained? Possible explanations may be related to the way regulations are interpreted by students from each university, to a certain "university culture", and to personal motivation. The first weeks of the experience revealed that coursework was not equally relevant for all students. The students from the Buenos Aires city university were strictly compelled to complete the assignment, and much was at stake for them. By contrast, at the public university and due to student pressure, enforcement was apparently more lax because there were alternative instances of evaluation.

Assuming this inference is correct, then for these experiences to work adequately, culture, incentives and rules should be extremely well aligned; so the design and implementation cracks are minimized and the team does not suffer from counterproductive activities.

Finally, time and technology are two core aspects that help understand what happened. The novelty entailed more time for the students to grasp the work modality and the consequences of their behavior. Although three months is a good deal of time for an academic calendar, it seems not to be enough for the students to understand the dynamics and peculiarity of these new work arrangements. Despite being alleged "digital natives", an unknown platform may represent a difficulty for some students. The logic of discussion forums was not easy to understand, synchronous interaction via MSN was different to face-to-face interaction, and the production of collective knowledge through digital means was not equal to sending SMSs. Distance work certainly proved to be a novelty not naturally adopted.

CONCLUSIONS

What conclusions and knowledge can be drawn from this experience?

One of the first conclusions is that the use of technology does not come naturally. For the students (aged 19 to 24), adaptation to this work modality was particularly difficult, because it entailed a break from their familiar manner of collaboration. A platform with only discussion forums and chatrooms was not enough for group interaction, exchange of ideas and work. On the contrary, technology represented an obstacle: silences, "time out", more time for coordination, misunderstandings, stereotypes, etc. The question that we have to ask is: Are these events inherent to the use of technology? The analyses and the bibliography indicate that they are not. It is very probable that, if the necessary precautions had been taken, such as making particular situations explicit, devoting time to trust building and familiarizing with the platform, then results could have been quite different.

With regard to competences necessary for virtual work, communication and (especially) writing skills are key for effective work. The ability to communicate through the use of technology entails knowing how to eliminate assumptions, share context experiences, create empathy, and ask before making inferences or stereotyping. Face-to-face work comes with experience sharing which ensures that those situations take place. Distance working means they have to be created.

Many aspects need to be underscored with respect to the design of a proper environment for those activities. When rules and incentives are not totally clear, participants may fall through the cracks created by the system. For example, the experience showed that if the students had other responsibilities, they would prioritize those where their presence was required. So it is evident that the importance of distance work needs to be assessed with regard to the student's face-to-face obligations.

Additionally, the cultural aspect is extremely important, and the adaptation of the participants' different cultural backgrounds needs to be taken into account. Cultural differences are liable to drag even more assumptions and stereotypes than are already abundant in this work modality.

Lastly, and about the experience in itself, the fact that the students underwent the difficulties entailed by distance working, gave the lessons learned a particular meaning for them. Sharing into the enthusiasm, but also the frustration, anger and indifference, and talking and reflecting on these feelings; transforms the experience into rich learning that goes beyond a mere course on digital alphabetization. As the students say, "for good or bad, we'll remember this experience". Which is exactly the aim of education in many aspects: developing experiences to motivate reflection, question preconceptions and generate knowledge.

In any case, there is one conclusion that is easily drawn from this analysis: these experiences need to be intensified through the use of criteria in the following three dimensions.

1) Improvement of interaction through the use of the most suitable technology, taking into consideration that technology with a potential for the new and the unknown also entails new and unknown problems.

2) Capacity-building for diversity and distance working. We not always have to work with people who think alike, who values the same things we do, or who shares our means and/or priorities. The generation of an active empathy is as urgent as is necessary.

3) Broadening of our understanding of virtual, self-managed groups of a diverse composition. We know too little about them and our knowledge is still partial and fragmentary. We need to gain more and better knowledge of these groups.

Insofar as more experiences of this kind are carried out, students will be better prepared for technology-mediated work modalities.

REFERENCES

[1]SEC Commission Staff Working Paper. (2003) 652. European Commission, 2003. Building the Knowledge society. Social and Human Capital Interactions

[2] Borghans, L. & Weel, Bas ter. (2004) Are computer skills the new basic skills? Labour Economics, vol. 11. Issue1. 2004

[3] Connaughton, S.; Shufler, M. (2007) "Multinational and Multicultural Distributed Teams: A Review and Future Agenda". Small Group Research, Vol 38 (3). 387-412.

[4] Steizel, S. (2005) "¿Qué capacidades, habilidades y cualificaciones son más requeridas por las empresas en la economía del conocimiento?" Learning Review, Junio – Julio 2005.

[5] Prensky, M. (2001). Digital natives, digital immigrants. On the Horizon, 9(5), 1–2.

[6] Tapscott, D. (1998). Growing up digital: the rise of the Net generation. New York: McGraw-Hill.

[7] Howe, N. & Strauss, W. (2000). Millennials rising: the next great generation. New York: Vintage

[8] Bennet, S.; Maton K; Kervin, L. (2008)"The 'digital natives' debate: A critical review of the evidence". British journal of education technology Vol 39 (5). 775-786.

[9] Cramton, C. "The mutual knowledge problem and its consequences for dispersed collaboration" Organization Science, vol. 12, nro. 3, may-jun, 2001, pp. 346-371

[10] Sproull, L. and Kiesler, S. (1986) "Reducing social context cues: electronic mail in organizational communication" Management Science Vol. 32 No. 11. 1492-1512

[11] Hinds, P. Bailey, D.(2003) "Out of Sight, Out of Sync: Understanding Conflict in Distributed Teams" Organizational Science. Vol 14, N°6 Nov-Dec. 615-632.

[12] Hinds, P, y Mortensen, M. (2005) "Understanding conflict in geographically distributed teams: the moderating effects of shared identity, shared context, and spontaneous communication" Organization Science, vol. 16, nro 2, may-jun 2005, pp 290-307

[13] Montoya-Weiss, M., Massey, A.P. and Song, M. (2001) "Getting it together: temporal coordination and conflict management in global virtual teams" Academy of Management Journal. Vol 44 No. 6. 1251-62.

[14] Walther, J. B. (1995). "Relational aspects of computer-mediated communication: Experimental observations over time." Organization Science, 6(2), 186-203.

[15] Maznevski, M. L., & Chudoba, K. M. (2000). Bridging space over time: Global virtual team dynamics and effectiveness. Organization Science, 11(5), 473-492 .

[16] Polzer, J.; Crisp, C..; Jarvenpaa, S..; Kim, J. (2006) "Extending the Faultline Model to Geographically Dispersed Teams: how Colocated Subgroups can Impair Group Functioning". Academy of Management Journal. Vol 49 (4). 679-692.

[17] Wenger, E. (2001)Comunidades de práctica: aprendizaje, significado e identidad, Paidos, 2001

[18] Martins, L.; Gilson, L ; Maynard, T. (2004) "Virtual Teams: What Do We Know and Where Do We Go From Here?" Journal of Management; Vol.30 (6); 805-835.

[19] Garrido, A. (2003) "El aprendizaje como identidad de participación en la práctica de una comunidad virtual" Trabajos de doctorado TD03-003 Programa de doctorado sobre la Sociedad de la Información y el Conocimiento http://www.uoc.edu/in3/dt/20088/20088.pdf

[20] Guitert, M.; Romeu, T; Perez-Mateo, M. (2007) "competencias TIC y trabajo en equipos virtuales". Revista de Universidad y sociedad del conocimiento, Vol 4. N°1.