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The Challenge of Distance: Opportunity Learning in Transnational Collaborative Educational Settings*

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Engineering education has traditionally offered problem-based, project-organized courses with a view to preparing students for their future career. Several universities have engaged in collaborative projects that offer courses in an international educational setting. In this article we present the results of an exploratory study of one such program involving students enrolled in separate Masters programs in Mechatronics and Mechanical Engineering at KTH, Sweden, and Stanford University, USA. The empirical data collected indicate improved interdisciplinary learning and increased knowledge and skills in related areas. It is argued that the problems posed by differences in time and space present learning opportunities.

INTRODUCTION

IN THIS ARTICLE we present results of an explorative study of a collaborative project with globally distributed students within the two separate Masters programs in Mechatronics and Mechanical Engineering at KTH, Sweden, and Stanford University, USA. The empirical data outlined in this article points towards both improved interdisciplinary learning and increased knowledge and skills in areas outside the disciplinary subject.

Transnational distributed learning can be presented solely in terms of advantages and disadvantages. However, we suggest that these categories need to be interpreted more flexibly than has been done in previous research. Rather than viewing the identified disadvantages as obstacles to the learning process and thus something to be eliminated, we propose that some of them be seen as opportunities for learning and thus as useful educational tools.

Why is there any interest in transnational distributed education? Some answers can be found in the empirical data presented below and in the literature, which identifies the following goals:

- to improve disciplinary learning and problem-solving skills by giving access to resources, equipment, professors, information, technology, and consultation (i.e., different approaches to disciplinary content) [1, 2];
- to improve general skills (e.g. presentation, report writing, critical thinking, personal development in general) [1, 2];
- to create awareness of and benefit from cultural differences [3];
- to increase variations in approaches to an assignment given by faculty or a corporate sponsor [4];
- to enhance motivation (e.g. the challenge of working in an international group, competition between teams) [1];
- to compare different educational systems as regards quality, level, and competitiveness in the market [1];
- to prepare students for careers and for work in a global market [5, 6].

These commendable goals have major implications for curriculum design and are a strong incentive to overcome the difficulties associated with distributed educational settings. This study sets out to explore some of these difficulties and to recognize their potential to become assets contributing to the learning process and the achievement of the intended goals.

To give one example of how this works, consider that in a transnational educational setting the absence of face-to-face meetings is commonly described as an obstacle to effective communication and is therefore assumed to have a negative effect on learning. However, another way of looking at this is to recognize that the lack of face-to-face meetings necessitates the exchange of very clear explanations between the two transnational teams. Consequently the students increase their skills in verbal and written communication of disciplinary content, which in turn necessitates a greater understanding of the subject they are studying. Thus while a lack of face-to-face meetings may at first sight be classified as a disadvantage and an obstacle, it can also be seen as providing an opportunity to achieve desirable skills.

The empirical data used in this study were

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collected from a transnational project involving students at Stanford University, California, USA and the Royal Institute of Technology (KTH), Stockholm, Sweden. The students were enrolled in two separate Master of Science programs in mechanical engineering. The data were collected through videotaped interviews with students and faculty, videotaped observations of student meetings and videoconferences, and from conversations with students. The data was collected during two years, in two consecutive courses, with two separate sets of students for comparison, during the period from October 1999 to June 2001.

The study was conducted within the Learning Labs at Stanford University and KTH, two nodes in the Wallenberg Global Learning Network (WGLN), which has its administrative center at Stanford University.

TYPES OF LEARNING ENHANCED BY TRANSNATIONAL TEAM EDUCATION

The difficulties a student may encounter in a transnational distributed team can be turned into opportunities for learning. These learning opportunities can be divided into two major categories: the first relating to improved disciplinary learning and problem-solving skills and the second to preparation of students for a future career.

Improve disciplinary learning and problem-solving skills

By working with students from different universities, cultures, and disciplines, students can encounter different ways of approaching problems and can get access to a broader variety of knowledge and skills within one discipline. Distance collaboration also gives access to resources, professors, technology, equipment, and information from the remote site that would not be available locally.

One frequent complaint about such courses is that the technology does not always function well. However, technology that does not work in one way or another is a recurring part of everyday life. It is important for students to learn how to deal with this, both as regards incorporating redundancy and by learning from the problem-solving that takes place when technology fails.

Prepare students for future careers

More and more business today is transnational and includes cross-cultural elements. It is important for students to have an opportunity to practice dealing with such elements in a setting where no risks are involved.

Distributed work is also on the increase. It is likely that people will be working in distributed teams and will work from a distance (e.g. from their homes), which means that team members will be in different working environments. Skills such as being able to build awareness and visibility at a distance and maintaining a presence with other members of a team will become more and more important the more people work apart.

Another set of skills that will also become increasingly important is the ability to use distributed communication and to explain things at a distance. The available media and technology need to be used in the best possible way. The course provides students with an opportunity to practice defining a problem, negotiating with sponsors, and communicating with faculty and supervisors at a distance, and to receive feedback on their progress. They also get to practice presentation techniques in front of people from a different culture, and sometimes in a language different from their mother tongue.

Course contexts

The data were collected by studying students enrolled in two regular courses offered at KTH, Sweden, and at Stanford University, USA, namely Advanced Mechatronics (4F1162) at KTH and Team- based Design Development with Corporate Partners (ME310) at Stanford University. Both are problem-based, project-organized courses running from October to June. Both courses involve teams of students working jointly with a corporate partner [1].

The KTH course, Advanced Mechatronics [7, 8], is taught as a part of the mechatronics program in the students' fourth and final year and attracts students from diverse backgrounds, including materials engineering, vehicle engineering, mechanical engineering, and industrial management organization. The approximately 40 students are divided into three to four teams with 10 to 15 students each, and each team is given a project right from the start [9, 10]. In the Stanford course the students are divided into 10 to 15 smaller teams, with three to five students in each team [2].

Each team is assigned a team coach from the faculty or the collaborating company/corporate partner. For the KTH team, the team coach, working with the students, allocates roles to each team member. These roles include project leader (i.e., coordinator) and member of sensor team, actuator team, tool team, etc. These roles are switched in each of the five phases of the entire project. The Stanford teams, due to their smaller size, are responsible for their own team management but are also assigned individual roles such as treasurer, documentation specialist, etc.

Each team has access to facilities at the university including laboratories, office space, computers, telephones, and fax machines, as well as socializing spaces. Most of the students are also enrolled in other courses while completing the mechatronics course/team-based design development course.

A history of successful collaboration between the Mechatronics Lab at KTH and its Stanford counterpart meant these two courses were deemed suitable for experimenting with joint projects.

Several such projects have already been conducted, with one or more teams at each university working on a collaborative project. Although the primary aim of the courses has not been to make students experts in modern means of communication, working in a team is a basic component in the curriculum. The distributed teamwork has been seen as an added component, which, while not officially in the curriculum, is sufficiently important to be embedded in the courses.

PROBLEMS AND LEARNING OPPORTUNITIES

Students working in distributed teams encounter problems in many different areas, ranging from the general team problems that tend to arise when students are working at a distance to problems specific to the distributed setting. Most of these problems can, however, be turned into learning opportunities, particularly if the students are guided in this direction.

The problems associated with communicating at a distance mean that the students have to learn what media to use, how to deal with new and unstable technology, and how to explain and discuss things with limited communication modalities. There are many 'opportunities' for the students to misunderstand each other, but these can also be valuable learning opportunities [11].

Another set of problems that increases with distance is the issue of awareness. Most distance communication tools lack many of the cues that can be seen in face-to-face meetings, and this can generate many problems. For example, when students do not get to meet their teammates, there is less motivation to get to know each other and it becomes harder to form a team identity. In the absence of visual communication, it is also easier to leave people out of discussions and decisions and it can be harder to maintain enthusiasm in the teams and to make sure some work really gets done [12].

With the increasing amount of distance work in today's business environment, skills in working at a distance are extremely valuable, and thus the students' problems, if handled correctly, can provide interesting learning opportunities [6]. Such projects can also make the students more independent learners/workers who require less supervision.

Although one aim of the transnational projects is to make the students learn to work independently, another is to teach them how to collaborate effectively. A team in a distributed setting is likely to have more diversity than a regular team, and will consequently probably encounter more problems, and also more learning opportunities. The students have to deal with diversity in personalities, curriculum, and culture; learn to handle time zone differences and all the possible problems that come with teamwork, and learn how to resolve conflicts without meeting face-to-face [13].

All these problems can be turned into learning opportunities provided, and this is most important, students are encouraged to see them as such and are given assistance so that they do not get bogged down but can take advantage of these opportunities.

Difficulties related to distance in time

The difference in time zones between Stanford University and KTH is nine hours. Given that the students were also taking other courses and managing their social life, this time difference meant that there were only two possible time slots for online communication: either early in the morning on the KTH side and late at night on the Stanford side or vice versa. Throughout the project, the two teams took turns in getting up early, for the morning sessions seemed to be the least attractive. The morning meetings usually took place at 8 a.m., and due to the nine-hour difference, the other side met at 5 p.m. on the KTH side or at 11 p.m. on the Stanford side.

The inconvenience associated with both the early morning and the late night meetings is obvious. However, after the initial phase of getting to know the other team, spontaneous meetings became more common and some students seemed to make use of the time difference. Unlike other teams on the Swedish side that did not collaborate with an international team, the KTH team soon developed an informal schedule with some students coming in very early and some coming in later and staying quite late. When asked about this schedule, the students explained that it facilitated meetings with the Stanford side and created a more flexible environment for studying in which the students could choose their own schedules. Due to the diversity in the students' preferences, the KTH lab was basically operating 16 to 18 hours a day. In comparison to the other KTH teams that operated on a more modest 8 to 10 hours a day schedule, the international team developed a very flexible work culture with an environment that encouraged collaborative studying and social activities and encouraged students to be more engaged in their project. The lab often turned into a social meeting place in the evenings; it was a place where the students could socialize with their friends even if they did not actually work or study; it was a place for informal meetings with friends and colleagues.

Although, the data presented here is insufficient to draw conclusions regarding the relation between the time zones and the actual educational outcome, the research does suggest some interesting possibilities. It suggests that time zone differences contributed to the students being able to adopt more flexible schedules and to the project team becoming more sociable and engaging in team-building activities.

Difficulties related to distance in space

The effect of the equipment used in videoconferencing on communication and team-based activities has been the subject of intensive investigation [14–17]. There has been much debate on how to communicate body language, unspoken words, and feelings in a videoconference. Current research points to the need for a system with enough sharpness, accuracy, speed, and sound clarity for the technology itself to be transparent and not perceived as interfering with communication in any way. The audio should be as clear as in a natural undisturbed conversation and the video quality should be equivalent to that in an actual face-to-face meeting. However, since the projects were not focused on the development of new technology but on the use of existing technology, the students were provided with standard commercial off-the-shelf equipment. One of the goals of the research study is also to investigate the scalability of such projects, to see whether it is possible for several teams, or the entire program at any university, to do joint transnational projects. It was thus important to use low-budget equipment.

The equipment chosen therefore consisted of ordinary personal computers (PCs) equipped with commercial off-the-shelf cameras, speakers, and microphones at a cost of less than 1000 US$ per team and system. All the software used was freeware. Early in the project the KTH team was also equipped with a video projector due to the size of the team. To improve the audio quality, both teams were also equipped with IP telephones. This article does not dwell on the technological side, but aims to give a short description of the quality, accuracy, speed, and reliability of the system.

It took both teams quite some time to get familiar with the systems used. Both were unfamiliar with the operating system, the freeware proved very unreliable, and there were many difficulties with the networks. On many occasions the network was down because someone was experimenting with a node at one or other department of either KTH or Stanford. Often the videoconferences were delayed or canceled because somebody had used one of the PCs the day before to play a network game or watch a movie, and the programs refused to run any more. This happened almost one-third of the time at the start of the project, but became increasingly uncommon as the students gained familiarity with the equipment.

During the more successful attempts of videoconferencing, when the equipment actually worked, the quality and reliability cannot be described as good. The video was sufficient to be able to recognize the other team, but it was a rare occasion when the video and audio were good enough to be able to tell that a person on the other side had actually understood what was said purely by reading body language such as a brief nod of the head or by hearing an affirmative 'u-huh.' Far more often, the videoconferences deteriorated into a one-way presentation by one team to the other, only interrupted by interjections such as 'Could you please repeat that, we momentarily lost audio over here.' The majority of communication soon took place in other media such as e-mail and ordinary telephone conversations.

During the observation of the two teams, the following points were noted in regard to the use of the technical equipment:

- On several occasions the students used the video link to describe and negotiate technical specifications, often by using the web cameras to send video of actual prototypes or of a technical solution of some kind. Despite the students' high levels of skill in making accurate drawings, faxing blueprints, and communicating technical specifications in traditional fashion, many hours were spent in videoconferencing sessions arguing about specific solutions or explaining specifications. The poor technical quality of the conferences meant that high demands were placed on the students' ability to give good technical specifications and explanations in, at least for the KTH team, a language that was not their first language. Most of the KTH students, particularly those who played a major role in the videoconferencing sessions, agreed that the improvement in their ability to communicate about a technical subject in a language different from their own had exceeded their initial expectations.
- Because of the unfamiliarity of the software and the equipment, the students soon agreed to keep the systems on as much as possible. It was easy to do this because the PCs used were administered by the students themselves and kept in their own labs. The main reason for deciding to keep the systems on at all times was to ensure that the equipment would be ready for the next videoconferencing session, but it was also hoped that the constant connection would in some way facilitate spontaneous meetings. The difficulties inherent in the use of immature shareware and ordinary PCs instead of commercial videoconferencing equipment were counterbalanced by the possibilities the in-lab equipment offered for telepresence and more spontaneous meetings. This feature proved extremely valuable, as will be described later in this article.
- The use of new technologies and free software introduced the students to new areas within their specific discipline. The PCs used Linux as their operating system. The majority of the students were accustomed to working in a Windows environment, but they soon became familiar with the Linux environment. In one of the projects, the Company-project (2000/2001), the actual prototype designed was based on a computer-platform running Linux, a solution that was greatly appreciated by the sponsors due to its cost-efficiency and stability.

These observations should not be used to make

deductions about enhanced disciplinary learning, but should rather be seen as promoting disciplinary learning, problem-solving, and preparation for future careers. The students repeatedly engaged in technical explanations and discussions, for one team in a language that was not mother tongue, often without or with poor video support. These discussions suggest the possibility of disciplinary learning in a setting similar to that of a seminar, with students explaining, commenting, criticizing, and arguing for their specific technical solutions. A comparison of the international KTH team and the local national KTH teams showed that the international team spent more time discussing, arguing, and criticizing elements related to the disciplinary area of the course.

From the outset, both teams were provided with web cameras in their respective labs that constantly broadcast images of the labs on the Internet. The Stanford camera (called the VIP camera) could be controlled remotely from the KTH side or from any node on the Internet, and the camera could therefore be used to locate and identify any student in the Stanford lab. Any computer on the Internet could also be used to identify the computers currently logged on to the camera. Due to the placement of the VIP camera, students could tell that someone was using it by the movement of the lens. On the KTH side, the camera (called the Webeye) could not be remotely controlled, but any user on the Internet could log on to the camera and download images or video to monitor the KTH lab. Students in the KTH lab could tell that someone was using the Webeye by an indicator on the camera, but could not identify the user.

The VIP camera was chosen for reasons unrelated to the research undertaken in this article. The Webeye was chosen with an eye to scalability; it cost less than US$500, and required minimal support.

Each camera could easily be disconnected or switched off by the team in whose lab it was situated. In the initial stages of the project, the cameras, and particularly the Webeye, were regularly turned off by the students. At first, the Webeye tended to be turned off after hours, in the evenings, and over weekends. When questioned about this, the KTH students explained that when one or more students were working or socializing in the lab and noticed that somebody was using the camera, they could not really understand the reason for this. It felt as though the person using the camera was invading their privacy, and therefore they turned off the camera. As the course progressed, the Webeye tended to be online more and more, until in the end it was practically online 24 hours a day, seven days a week. The VIP camera was basically online constantly throughout the course, but quite often the mechanism for remotely controlling the lens failed to work. For some reason the camera tended to get stuck in a position where only a window or a ceiling could be seen, so that quite often the videolink in this direction was for all practical purposes down. However, this camera, too, tended to function better as the course progressed.

The initial reason for installing these cameras was to compensate for the lack of face-to-face meetings by facilitating regular videoconferences and using the cameras to provide telepresence. A great deal of time at the beginning of the project was devoted to discussions regarding integrity, video surveillance, if and how to password protect the cameras, and how to monitor the users of the cameras. Our observations show that initially the students did not accept the possibility of constant monitoring, as demonstrated by the fact that the Webeye was repeatedly turned off. However, they fairly soon prioritized the advantages these cameras offered in relation to the disadvantages connected to the question of privacy. By describing the patterns of use of the cameras, we will attempt to identify and describe these advantages.

Our only source of information about who used the Webeye, and when, was the students themselves. By contrast, the Stanford students could monitor the users of their VIP camera.

- The KTH Webeye seems to have been used mainly by the KTH students themselves. Almost all of the twelve KTH students had an Internet-connected computer at home. All of these students used the Webeye as a way of keeping in contact with the lab. Students and teachers as well as friends and relatives appreciated the ability to immediately see which students were in the lab at any time, to see whether a particular student was there, and to see whether what was happening was work or social activities.
- One KTH student reported logging on to the Webeye every night before going to bed. If there was anyone in the lab, the student would call them on the telephone to ask what they doing and to say goodnight.
- One KTH student reported that the Webeye was used more than usual the morning after a late night of work. The reason given for this was that many students stayed home longer than usual on such mornings and therefore had a greater need or interest in seeing what was happening in the lab. Nobody really wanted to be the last one to come in, but there was no reason to come in before the others.
- One Stanford student reported that another Stanford student always logged on to the VIP camera immediately on returning home in the evening. The reason was said to be that this student was reluctant to leave, but had to for various reasons, and therefore continued to stay in contact from home.
- Both the KTH and the Stanford students said that they often used the cameras to see what the other team was up to. These contacts, however, were not connected to the immediate activities

going on in the lab or part of an attempt to locate a particular person or to contact somebody in particular, but were driven mainly by curiosity about the other team's activities.

The students' reports of their use of the cameras, our own observations, and interviews with the students reveal that these systems of telepresence, the web cameras, came to play a major role in the respective teams even though the systems were originally meant to be used to overcome the difficulties associated with the lack of face-to-face contact. Even though the systems facilitated spontaneous communication between the KTH and Stanford teams, the students developed a far more effective use of the cameras within their own teams.

Difficulties related to increased complexity in team/project/course management

During the interviews all the students were asked to describe the main problems or difficulties they had encountered in relation to their international collaboration. In addition to the difficulties described above, which related to differences in time and space, a third area of difficulties described related to course management. Most of these difficulties were associated with the fact that the two distributed teams were in different academic environments or different faculties. The main points can be summarized as follows:

- *Different schedules.* Each team followed a schedule set by the respective faculty. Even though the faculties tried to coordinate these schedules, external factors such as spring break and the Easter holidays affected the two teams. Consequently important deadlines and presentations sometimes fell on different dates. On several occasions, these differences in schedules threw the teamwork out of phase, with one team anxious to focus on an upcoming presentation while the other team wanted to focus on more strategic objectives.
- *Different deliverables.* Over the two years of the study, both teams were always in a situation where they were operating alongside several other local teams. The local faculty could not give the international team advantages over these local teams. Consequently the two distributed teams were asked by the respective faculty to produce and present deliverables on the same basis as the other local teams. Thus the combined international team presented deliverables to both KTH and Stanford University, and each team had to make the presentation without the assistance of the participants at the other university. The students regarded this as one of the major difficulties and did not believe that they gained anything from the collaboration in this regard. The fact that the deliverables often overlapped in both content and time meant that the students felt they were overloaded.
- *Difficulties regarding the supervision of the actual project.* Due to the different backgrounds of the respective faculties, both as regards educational methods and design methodology, the two teams were coached differently. The students experienced difficulty in situations when the two teams felt that they were being guided in different directions.

Before discussing the opportunities for learning from difficulties with course management, the communicational aspects will be briefly summarized. Figure 1 represents the total number of nodes and the intensity of the communication between the nodes.

As shown in the figure, the total amount of communication between the nodes varied. The most intense channels were between the student teams and between the faculty and team at each location. Due to the location of the corporate sponsor, which in both studies was located within

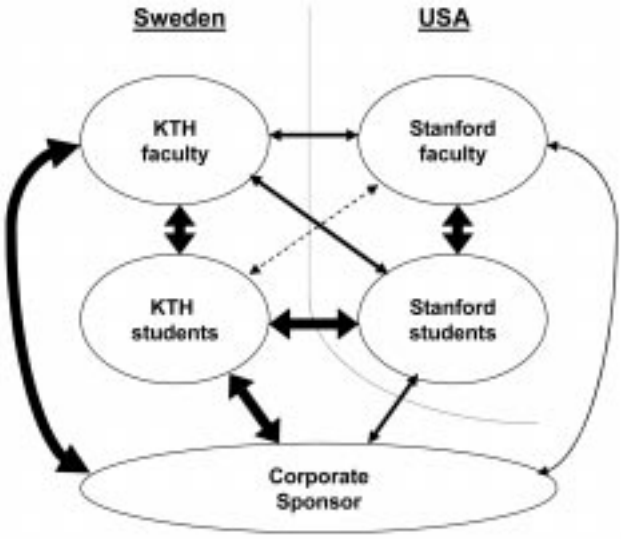

Fig. 1. Summarizing the communication.

an hour of the KTH campus, the communication between the KTH students and the corporate sponsor in both studies was as intense as between the faculty and the students. However, there was rarely feedback from the Stanford faculty to the KTH students.

Even though the students tend to regard the difficulties in course management as issues for the faculty to handle, such difficulties can also be seen as offering learning opportunities unique to this distributed setting. As the figure makes clear, the complexity of communication increases greatly when additional teams are introduced, and the problems involved in integrating faculties may even seem impossible in scenarios with more than two teams. However, the task of achieving integration could provide the distributed students with an opportunity to achieve greater homogeneity and could make the team more independent, so that it could be seen as one node in communication with the faculty nodes and the corporate sponsor node. For example, the two teams might jointly design their schedule and together negotiate a common schedule for deliverables with the two faculties. They might agree on common deliverables and arrange to present them alternately at KTH and at Stanford University. Such an experience might also benefit the two teams by bringing them to the realization that rules are not set in stone but are rather a framework within which the team is given a larger responsibility.

Another potential benefit of the international setting is that the two teams are confronted with different educational cultures and design philosophies, and thus have an opportunity to critically compare them and determine their own preferences. Comparison of the international teams and the local teams revealed that the international teams showed a higher degree of flexibility in the process of defining their problem or task. This flexibility may be interpreted as an indication of a flexible space between the two faculties that the collaborative international team took advantage of in shaping their project more freely.

DISCUSSION AND CONCLUSIONS

The three main difficulties in transnational distributed learning, namely time differences, spatial distance, and course management, have each been discussed in relation to previously stated educational goals. Empirical data from the two projects studied reveals links between the difficulties and the educational goals, links that show that in a favorable setting these difficulties could be turned into learning opportunities.

To summarize: The difficulties related to distance in space were linked to the educational goals of enhancing disciplinary learning and improving general skills through the increased amount of time the students on the distributed teams spent communicating and discussing. The difficulties related to distance in time were linked to the educational goal of enhancing motivation through moving toward a more flexible learning environment and course schedule. The third set of difficulties, which related to the increased complexity of course management, were linked to the goal of creating awareness of cultural differences and of different educational systems, and also to the goal of enhancing motivation through moving toward more independent teams working with the different course structures and university systems.

What has been presented here is an attempt to investigate the possibilities of opportunity learning in a globally distributed educational setting. However, there is insufficient data to draw deductions regarding the actual learning outcomes. Rather, the focus has been on identifying certain possibilities for transforming the so-called disadvantages of a globally distributed setting into learning opportunities. The empirical data does indicate enhanced disciplinary learning as well as increased knowledge and skills in areas related to the transnational setting. Further research is needed to further clarify these signs and make stronger connections. One possible approach would be to undertake an intensive study of the students' conceptual understanding by describing the evolution of individual's descriptions of the project, the task, the approach to solving the problem, and in particular how this conceptual understanding is affected by the students' constant need to describe, discuss, and argue with distributed teammates.

One major result of this international collaboration is an increased awareness that the role of the teacher is changing, or needs to change. This study showed that the responsibility of the teams increased with the distributed setting, and that the traditional role of the teacher becomes increasingly complex with the increasing number of nodes. Consequently there is a need for communication between the faculties and for flexibility regarding the responsibility of the teams and course management. If the complexity is used by the team as an opportunity to move toward a more independent status, motivation might increase, but from the faculties' point of view it might become difficult to coach the team toward the disciplinary educational goals. In this respect, this study supports the finding of Wilczynski and Jennings [6] that 'the success of virtual teams is heavily dependent on the preparation of the project leaders.'

The empirical data collected in this study also make it clear that the opportunities are opportunities and not absolute implications. Without adequate management, students will perceive the so-called disadvantages only as disadvantages, but with proper guidance they may be brought to a broader view of what they have learned.

Future work

The conclusions presented in this exploratory qualitative study are based on preliminary data describing the learning processes as observed, understood, and documented by the researchers. As mentioned in the article, no other conclusions should be drawn from this material other than the signs mentioned: signs of enhanced disciplinary learning, signs of increased awareness of other cultures and educational systems, signs of increased understanding of difficulties related to transnational collaboration, etc. However, we believe that these signs offer important guidelines for educators by increasing their awareness of the difficulties, and for future research into how to turn the difficulties related to distance in time and space into opportunities for learning. The next research step will be to investigate further the signs of enhanced disciplinary learning.

There could also be value in a systematic investigation that quantified the data and codified the results and then evaluated these results in comparison with reference teams, both transnational teams and local teams, in order to be able to draw general conclusions.

Since interest in transnational and global educational collaboration is increasing, we would also welcome more studies in this area in the spirit of further exploration and investigation of possible opportunities for learning.

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