



Instruction of a university course by videoconference between two Latin American countries

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| Presented: 09/10/2013 | Accepted: 19/11/2013 | Published: 20/12/2013

Abstract

The new technologies of information and communication are valuable tools that used correctly increases the teaching-learning process at all levels of the education system. In recent years the use of videoconferencing as a tool at the university sector has been increasing due to educational and social potential of connecting processes and experiences between teachers and students in different parts of the world. The article describes an educational experience between two ibero-american countries about the implementation of the university course *Research Methodology* for students of the Grade in Physical Culture, Sport and Recreation. Through technical, organizational and pedagogical models it is analysed the scope, opportunities and weaknesses of university course through videoconferencing since its implementation, development and evaluation.

Key words: videoconferencing, university, higher education, physical culture

Resumen

Las nuevas tecnologías de la información y la comunicación (TIC) son herramientas valiosas que, utilizadas correctamente, favorecen el proceso de enseñanza-aprendizaje en todos los niveles del sistema educativo. En los últimos años el uso de la videoconferencia en el sector universitario ha venido en aumento debido al potencial educativo y social de conectar procesos y experiencias entre profesores y estudiantes situados en diferentes partes del mundo. El artículo describe una experiencia educativa entre dos países iberoamericanos sobre la implementación de la asignatura *Metodología de la Investigación* para estudiantes de la titulación de Cultura Física, Deporte y Recreación. A través de los modelos técnico, organizativo y pedagógico se analizan los alcances, oportunidades y debilidades de la asignatura impartida por videoconferencia desde su inicio, desarrollo y evaluación.

Palabras clave: videoconferencia, universidad, educación superior, cultura física

Resum

Les noves tecnologies de la informació i la comunicació (TIC) són eines valuoses que utilitzades correctament afavoreixen el procés d'ensenyament-aprenentatge en tots els nivells del sistema educatiu. En els últims anys l'ús de la videoconferència com a eina de les TIC en el sector universitari ha vingut en augment a causa del potencial educatiu i social de connectar processos i experiències entre professors i estudiants situats en diferents parts del món. La videoconferència ha transformat la forma en què la pedagogia i l'aprenentatge es duen a terme a l'aula universitària. L'article descriu una experiència educativa entre dos països iberoamericans sobre la implementació de l'assignatura *Metodologia de la Investigació* per a estudiants de la titulació de Cultura Física, Esport i Recreació. A través dels models tècnic, organitzatiu i pedagògic s'analitza l'abast, oportunitats i debilitats de l'assignatura impartida des de videoconferència durant l'inici, desenvolupament i avaluació.

Paraules clau: videoconferència, universitat, educació superior, cultura física



1. Introduction

Information and Communication Technologies (ICTs) are valuable tools which, if used correctly, contribute to improving teaching and learning processes at all levels in the education system. In recent years, the use of videoconferencing as a tool by universities has been extended due to the educational and social potential of connecting processes and experiences between teachers and students in different parts of the world, transforming the way teaching processes are built in the classroom (Duhaney, 2005; Koeber, 2005; 2008). Kaufman and Brock (1998) rightly pointed out that videoconferencing brings together an instructor and several participants in remote locations using audio and video communication, creating an experience which is closer and closer to the traditional classroom. Videoconferencing is a synchronous interaction model in which all players meet up simultaneously though they are actually at different locations (Bravo, 2004). It creates teaching opportunities by means of a “social presence”, overcoming the spatial constraints of other systems like chats or instant messaging while favouring exchanges with other cultures that enrich teaching and learning with their experience and knowledge (Arnaiz, 2010).

2. Methodology and Results

The methodology applied in the experience between two Latin American countries using videoconferencing has been structured as follows:

1. Experience in the use of videoconferencing in university
2. Description of the experience of teaching a course via videoconferencing between two countries
3. Analysis of the experience based on a literature review

2.1 Experience in the use of videoconferencing in university
Reference is made next to some studies on the use of videoconferencing in Spain, Europe and Latin America.

In Spain, the use of videoconferencing in higher education has been widely studied and discussed. The *Universidad de Educación a Distancia - UNED* (Spain's Distance Education University) completed a study to analyse the situation of videoconferencing at its head office and partner institutions, concerning both the procedural level and the quality of contents (Sevillano *et al.*, 1998). In turn, the Distance Education Unit of the University of Murcia (2004) conducted an educational experiment in which a course from the curriculum of the BA Degree in Education Studies was taught on a semi face-to-face basis. 284 students attended sessions delivered by different lecturers acting as speakers.

In Europe, García Pascual and D'Angelo (2008) explored the technological and educational possibilities of an experience developed by two secondary schools and one Spanish university for the implementation of Content and Language Integrated Learning (CLIL) methodology through videoconferencing. The authors emphasized the interaction between teacher and students, especially for small groups, the selection of spaces and the possibilities offered by the speed and reach of the web. More recently, Martín-Cuadrado *et al.* (2012) reported a videoconference experience based on a series of presentations on education-related topics which aimed to promote language and communication skills in Education Studies lecturers and students from

the Universidad Nacional de Educación a Distancia and the University of Utah.

In Latin America, similar experiences have been carried out using interactive videoconferencing, especially group video, involving the University of Murcia and the Universidad Nacional Autónoma de México (UNAM) within the framework of a university specialist programme focused on group work (Jerome Montes, 2003). As positive elements of this one-off session, the increased proximity of the participants was highlighted as a way of favouring interaction.

Also in Latin America, Bañuelos Márquez (1998) analysed the practices, attitudes and beliefs of UNAM lecturers with regard to videoconferencing in distance teacher education, underlining the favourable perception of the implementation of the system. From the same viewpoint, in Costa Rica, Ugalde (2010) reports on a video teaching experience at the Universidad Nacional de Educación a Distancia (UNED) - San Carlos. The author argues that the preparation, coordination and planning of a videoconference is more demanding than those of a traditional lecture, as it requires greater dedication and ongoing feedback. More recently, Alvarez *et al.* (2013) examined the influence of the interaction of the various factors involved in teaching and learning via videoconferencing at the local level. They collected the opinions of the participants on the advantages and disadvantages of using new forms of educational communication within a state university in the north-west of Mexico, based on the participants' answers about structural, organizational, curricular and technical factors in the use of videoconferencing.

In conclusion, the aforementioned studies have helped generate a context for the different applications of videoconferencing as a means of supporting the educational process, obtaining similar experiences but with different populations from those in the experience that we present next.

2.2 Description of the experience of delivering a course by videoconference

The experience presented below shifts away from the traditional model implemented not only in higher education in Colombia but also in the development of research skills in university students. The experience did not consist of isolated videoconferencing sessions within the framework of lectures, seminars and group work between people based in two Latin American countries; rather, the experiment was conducted as part of the delivery of a full course: the lecturer responsible for the subject was located in Valencia, Spain, while his students were in the city of Bucaramanga, Colombia. As will be explained later, the course was delivered over 15 weeks, with a total of 96 academic hours, out of which 44 hours were conducted by videoconference between February and May 2012, and the rest of the time was used by students to work autonomously.

For that reason, we believe that the description of this experience –which was atypical not only in terms of ICT use in higher education but also for the university and its faculty and students– will help to identify alternative pedagogical mechanisms to bring processes and individuals closer in university education.

Literature on videoconferencing in higher education abounds (as proved by the papers referred to earlier) but, to our knowledge, no educational experiences have been reported on the video teaching of a complete course from the curriculum between two Latin American countries, espe-

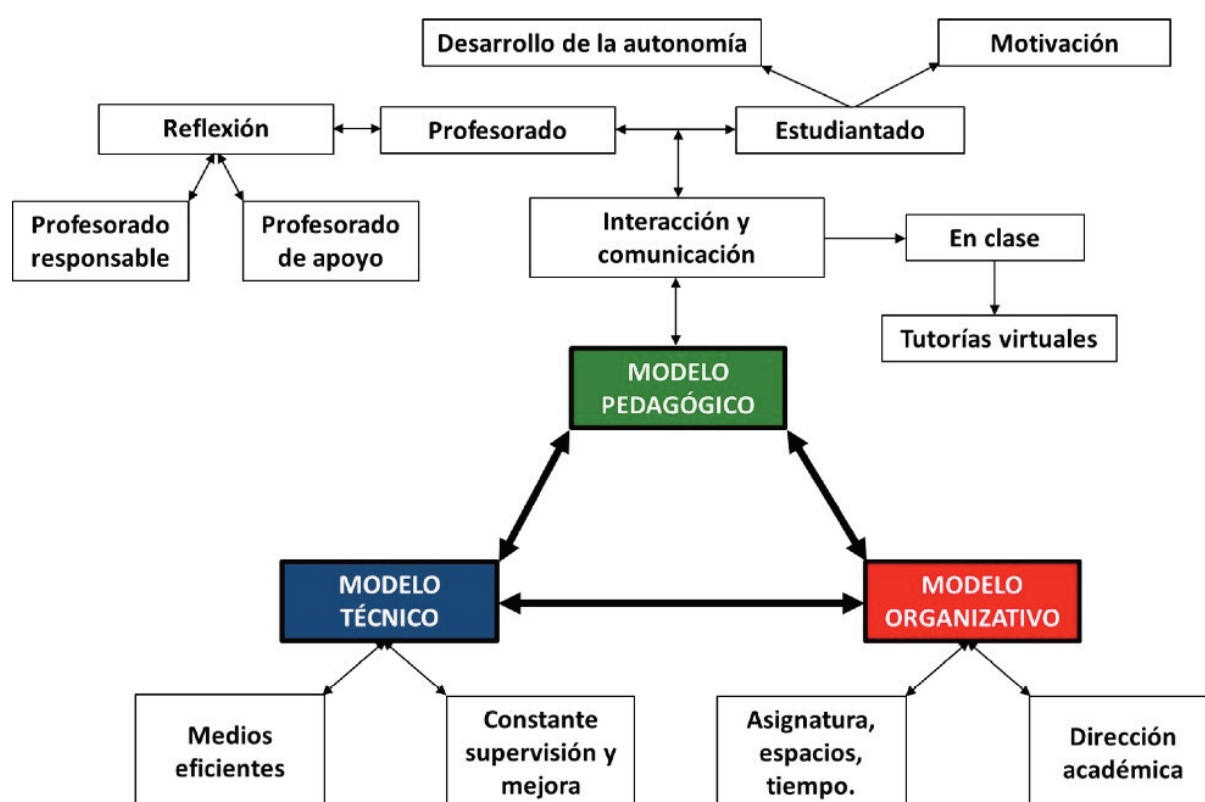


Figure 1. Models for the instruction of a university course by videoconference

cially in the area of Physical Education and Sports Science. We therefore believe that sharing our experience will provide an insight into the use of videoconferencing in higher education.

The technical, organisational and pedagogical models used for the video teaching of the course are described next.

Technical, organisational and pedagogical models used in our video teaching experience.

Based on Cabrero's media model for the use of videoconferencing in higher education (2003), as well as on our own experience and literature review on other educational experiences, the next diagram summarises the experiment (Figure 1).

The technical model

The process started in Bucaramanga using a "VGA" basic-resolution webcam with a built-in microphone compatible with Windows 7. It was connected, via the 1.0 USB port, to a laptop, as the rooms in which the procedure began only had very basic computers. The lecturer in Valencia, Spain, used a laptop with a built-in camera and microphone compatible with Windows 7. In the first sessions, the internet connection was wireless, and a cable was used later on.

Skype® videoconferencing was used because it was free, reliable and easily accessible, and because it did not require any special location or connections. Its interface includes tools for written communication with students, and it allows all connected users –following payment– to share the screen (for slides, documents and relevant information for the development of the lecture). We decided to use this particular software because other virtual environments used in teaching such as Moodle, Blackboard, video-streaming, etc. re-

quire technical skills and abilities typical of students and teachers as well as advanced technical specifications (video-streaming sessions) and suitable conditions which in our case were not available (e.g. specialised classroom with computers for each student).

The organisational model

Reasons for the use of videoconferencing

Higher education institutions in Colombia seek to incorporate ICTs as a way of systematising teaching practices and qualifying their educational service (Osorio *et al.*, 2010). The academic program in which the experience took place belongs to the health science area and its curricular structure includes a large number of theoretical and practical courses, which partly explains why the implementation of virtual processes by the faculty is not extensive.

Faced with the need to generate new spaces of knowledge and to internationalize it, different alternatives were explored with a view to implementing virtual teaching and learning processes. Some of these alternatives include virtual learning platforms like Moodle or Blackboard; these software programmes provide different on-line teaching and learning tools that facilitate the creation and management of teaching and learning spaces on the Internet, where both teachers and students can interact. But such tools (offered by the Virtual Education Department) were ruled out because the lecturers were not experienced and the students lacked the specific skills, as for them this was their first time in a virtual learning environment. In this respect, Gregori and Garganté (2005) note that, before initiating processes of this kind in the classroom, ICT skills for educational purposes must be built. For all such reasons, videoconferencing



Figure 2. Progression of space use of in the instruction of the course

was chosen as the most adequate tool for the group of students and lecturers. Given its versatility, ease of access, simple use and relatively low cost, videoconferencing can be successfully used in education (Bravo, 2004).

At the international level and particularly in the case of Colombia, the presence of ICTs in higher education processes is considered to be a necessity and, more and more, a key requirement in academic programmes for the institutional recognition of quality by public authorities. Thus, success is partly determined by initiatives which integrate ICTs in their institutional mission and vision and in the objectives pursued by university in teaching and learning processes (Osorio *et al.* 2009). Along these lines, it is worth noting the involvement of the university's managers throughout the course, as well as their willingness to improve the educational experience implemented. The project was also justified by forecasts made by Colombia's Universidad Santo Tomás and the need for flexibility and internationalization of its curriculum.

Course features

This educational project was undertaken from February to June 2012. The participating university was a private institution (Universidad Santo Tomás, Bucaramanga section) in the north east of Colombia (Bucaramanga) and the point of origin was in Valencia, Spain. The lecturer responsible (PhD) and his teaching assistant (MSc) lecture in Physical Culture, Sports and Recreation. The class consisted of five senior students (Year 4) from the Physical Culture, Sports

and Recreation degree, four men and one woman. Lectures were held on Wednesdays at 10:00, Colombian time (18:00 Spanish time). A total of 16 sessions were completed.

In addition to lectures by videoconference, other communication channels were also used:

- E-mail: for workshops, clarifying doubts, sharing information, etc.
- Tutorial sessions by videoconference.

The experience had three milestones time-wise, concerning the use of spaces and logistic conditions under which the project developed (Figure 2). At the beginning, the room was inadequate for videoconferencing, as the location of the computers, the camera and the projector, and the sound were not ideal (A). At a second stage, the students in Bucaramanga, Colombia, had their sessions in a more suitable room, but some technical issues remained in relation to the sound and the lighting which prevented the operation from running smoothly (B). In the third phase, which accounted for 70% of all sessions, the room was perfect both technologically speaking and as a teaching space that favoured the development of the sessions (C).

The pedagogical model

The course

The course taught was "Research Methodology II", year 4 of the curriculum. This subject is intended to prepare students for their dissertation/final project in Year 5. Keeping

that goal in mind, at the beginning of the academic semester and before the first videoconference, following the regulations of the University, a *Course Plan* and a *Class Plan* were produced specifying the objectives, skills, methodology, evaluation system, and specific activities of each session. These *Plans* provide teaching guidelines for all subjects included in the University's curricula. The course was presented as a space where student responsibility and independent work were to be strengthened, and where the lecturer was to become more than an agent for the reproduction of knowledge, i.e. a guide or tutor who saw to it that course goals were fulfilled.

Course contents

Based on the plans, the topics and thematic contents (Solano-Fernández, 2005) that would be covered in the videoconference sessions were selected. These were the contents: selection of research topic, rationale and approach to the research problem; construction of the state of the art and theoretical framework and, finally, methodological design of the research. These three large blocks were proportionally distributed along the semester.

Course evaluation

The meaning of the evaluation, the deadlines, the objectives and the marking system met the requirements of the university in Colombia.

The evaluation consisted of:

- *Course grade (70%)*: 1. Workshops (33%); 2. Evaluation of each cut (33%), and 3. Mini-assignment (33%).
- *Final exam (30%)*: *Research Proposal*. The *Research Proposal* was submitted in writing and presented orally in a videoconference session.

The Research Proposal

In line with the ongoing evaluation concept, students started preparing their research proposals right from the first classes. For the percentage in the final grade, students had to present their slides for fifteen minutes approximately and show the layout they had been working on during the semester. At the end of the presentation, the floor was given to the attendees, and the lecturers would ask questions and make comments and recommendations. In the final part of the session, the lecturer in Spain would give his feedback on each research proposal, and comment on the video teaching experience.

Example of a videoconference lecture

One aspect to consider before starting video teaching is the duration of sessions. Two-hour videoconference sessions were held once a week at the usual course periods.

A typical videoconference lecture is explained next. Twenty minutes before the start of the session, the lecturer in Valencia and his assistant in Bucaramanga met for five minutes to clarify the contents and address potential technical issues. At the scheduled time –within the university's working hours– the students (five in total) arrived in the room and sat in front of the digital whiteboard where a Power Point presentation was projected. The lecturer started the session by welcoming his students and presenting the contents to be covered and discussed in the session. After presenting the activities of the day, feedback was first given on the main points of the previous lecture.

Among its many utilities, Skype© allowed the users to project the picture of the lecturer in Valencia while showing his slides, in other words, he shared the presentation on his computer while his face was displayed in a small picture. In this way, students could see both the contents and the lecturer real time. The lecturer in Valencia was also able to see his students most of the time (except for a few occasions).

The 'master class' format was usually avoided. Instead, small interventions by the lecturer would take place, followed by questions from the students, thus making room for dialogue at both ends. Similarly, if a student had a doubt, the lecturer would give him/her the floor, as the visual field was large enough so as to see all of the pupils. In cases in which the lecturer could not see a student asking for the floor, the lecturer in Bucaramanga, who was sitting next to the computer, warned his colleague in Valencia orally.

A few minutes before the end of the session, the lecturer summarised the main points and clarified doubts. Finally, he would give instructions for the weekly workshop assignment, to be submitted in the next session. These instructions were also sent over the email in *pdf* format, together with supplementary materials (readings).

After the session, the lecturer and his assistant commented on how the class had gone, and reflected about technical, logistic and methodological aspects to improve or about those aspects that had worked properly, to bear them in mind for the coming lessons.

2.3 Analysis of the experience based on a literature review

The structure, the implementation process and the development of the project are analysed next through the main elements of each model (technical, organisational and pedagogical) that systematize the process developed in the videoconferencing experience.

Based on the literature review, the categories used have been selected according to the process experienced by the participating lecturers. They are considered to be the most significant in developing the discussion presented below. The links between these categories and the experience are established in conjunction with a descriptive component intended to capture how the experience unfolded, thus opening up future research avenues to further study the factors that must be considered in the implementation of videoconferencing in higher education. The list of categories is as follows:

- First contact.
- Previous contact favours interaction.
- Communication and interaction.
- Interaction and communication process, "Personalised video tutorials".
- The Research Proposal.
- The assistant lecturer's role at the recipients' site.
- Number of students.
- Overcoming technical challenges.
- The lecturers' experience.

First contact

An item for analysis in the implementation of videoconferencing processes in education is that of the students' previous contact and familiarity with this system. It has been noted that previous experience with videoconferencing in students determines whether the educational process will be positive or will have to be restructured over time (Sugrue et al., 1999).

Along the same lines, Brown *et al.*, (2005) argue that in the process of building closeness between teacher and students, motivation in the latter is an additional factor that feeds back communication between the two points. The authors found that students who were little familiar with the use of ICTs in higher education preferred face-to-face sessions. Conversely, for students with some ICT experience, the physical presence of the teacher did not seem to be so relevant, expectations in the learning process prevailing (Sugrue *et al.*, 1999).

When the lecturer of the course was first introduced to the students, they seemed puzzled, as they did not understand how a lecturer who was in Spain could 'dictate' a research lecture, research being –among other things– one of the most relevant areas in a graduate's profile. This finding points to the need for a standard methodology to be able to understand the perceptions of university students as regards the use of ICTs in higher education.

These are some comments submitted by students to the Dean when the course was first presented.

"I won't learn much this way, the teacher is not here for questions"

"You can't learn if the lecturer is not present"

"It makes me sleepy to be in front of a TV all the time, it's like watching telly"

"If I'm late for class I miss more things"

"I feel I've been cheated, we don't have a real lecturer"

"The university is not prepared for this type of teaching"

"How are we going to study the course without a physical tutor?"

"I don't like it"

"We need a real teacher"

The working team always kept in mind that the university process initiated by this experience had to become a tempting challenge and an ongoing adventure, for students to become freer individuals and autonomous professionals who can boost their own educational pathways. From this viewpoint, Remy (2004) argues that individuals build their own cognitive structures as they interpret their experiences in particular situations, as was the case with the group of students who –as they were gradually made responsible for their own education– gave meaning to the lecturer's intervention and appreciated his proposals, as permanent support in building their research proposal and final-year project.

Previous contact favours interaction

Previous usage of ICTs by students, as well as positive previous experiences in the use thereof in university, can have a favourable effect on the development of videoconferencing sessions. For example, Meena *et al.* (2011) pointed out that university students who were more familiar with ICTs had a positive attitude towards the use of videoconferencing as opposed to those who were not. A way of improving their attitude is to know their perceptions before hand, this being a key element to preparing programs that enhance the acceptance and implementation of videoconferencing.

Koerber *et al.* (2008) evaluated the use of videoconferencing in the instruction of an Introductory Sociology course. The authors found that the students' perception of teaching effectiveness *vs.* situation generated a positive change in perception. They also noticed that students with

lower levels of initial motivation perceived the course more negatively. Conversely, for students who started the course with higher levels of motivation, differences related to the effectiveness of the course were independent from the perception of a traditional class. Likewise, the authors suggested the need to assess the degree of motivation before starting video teaching.

Due to inexperience in the implementation of these processes in our case, the students' degree of familiarity was unknown and the same applies to their favourable perception of the use of ICTs in higher education. However, the comments raised to the Dean are representative of their initial attitude towards the way in which the subject was going to be taught. Further studies with Colombian university students are necessary to evaluate the elements described above.

Communication and interaction

One of the most interesting points addressed by experts in the study of videoconferencing in education is the construction of a communication process between participants (Carrell and Menzel, 2001). Concerning this, Brown (2005) reported that students perceive teaching and learning situations from the perspective of more or less *immediacy* between participants. The authors argue that this concept includes the following elements: 1. The limitation of the camera in covering a given number of students; 2. Reduced capacity for "face to face" contact; 3. Limited amount of direct eye contact. In other words, the absence of interaction may negatively affect teaching and learning. They found that an environment where the lecturer's immediacy is reduced might pose problems to those students who start the course with lower levels of motivation. In turn, Ried *et al.* (2004) and Kidd *et al.* (2006) reported that students perceive that the process of interaction is more favourable when immediacy and closeness between the teacher and the students are built. That is, when students perceive the teacher at the point of origin to be more than just a picture on the screen. According to the authors, one of the keys that differentiate traditional classes from video teaching is the teacher's ability to enhance communication with the student, which in turn raises his/her motivation and subsequently the learning.

A recent study conducted in Sweden, Lögdlund (2011), examined interactions between class participants. In the author's account, verbal communication is the main category of interaction in a videoconference class. Similarly, Plonczak (2010) explored the benefits and challenges of teaching via videoconferencing, and its relationship with an "inquiry-based learning model" in science and mathematics. Similarly, Brown *et al.* (2005) pointed out the need to strengthen verbal contact continuously by posing questions (teacher) to be answered by students, enhancing communication (Brown *et al.*, 2005). More recently, Martín-Cuadrado *et al.* (2012) concluded that participants in videoconference sessions considered an aspect to be improved the use of rhetorical resources at key moments in order to draw more attention from the audience.

In our experience, verbal and visual contact with students developed through inquiry; the master class format was very little used. Contact between the teacher and the students concentrated on questions related to each research proposal; students talked about this quite a lot with the assistant lecturer. From this perspective, concerning the de-



Figure 3. Evaluation session of a preliminary research

velopment of skills in university lecturers and the use of videoconferencing, Wiesemes and Wang (2010) recently pointed out that it could be regarded as a semiotic tool that supports and facilitates the understanding of processes through dialogic practices between mentors and mentees. Hence the importance of improving strategies aimed at strengthening teacher interaction through videoconferencing and generating and creating spaces that encourage teaching and learning processes.

In our experience, we lacked the necessary empirical support to discern whether this methodology was viewed positively by the student. However, we believe these observations can open the door to further studies on the implications of the strategies that can be used in the development of videoconferencing sessions in higher education.

Interaction and communication process: Personalised video tutorials

As previously mentioned, the absence of eye and body contact in videoconference classes compared to traditional teaching is a factor that can negatively affect teaching and learning. However, this situation can be improved if interaction is strengthened through alternative channels of communication and interaction.

One way of reinforcing symbolic interaction is personalised virtual tutorship. From this perspective, one of the positive factors supporting the teaching-learning process through the use of videoconferencing lies in expanding the educational setting beyond daily lessons, i.e. more contact through virtual meetings, frequent contact over the email or virtual tutorials via videoconferencing between a student and his/her teacher (Brown *et al.*, 2005.; Solano-Fernández, 2005). Kidd *et al.* (2006) found in college students that their perception of the lack of interaction was partly solved by the introduction of a mentoring process.

The support given in tutorials requires the teacher to commit to opening communication channels as well as more student engagement based on autonomous work. The personalised video tutorials started with an email sent by the student to the lecturer in order to arrange a meeting in non-teaching hours. As the time difference between the two countries is six hours, these Skype© meetings had to be held from 10 am to 15:00 including weekends. In the meeting, the student asked the teacher questions about the previous lessons and his/her research project draft. These sessions took about an hour.

The assistant lecturer's role at the recipients' site.

Regarding the role of the lecturers both at origin and destination, the figure of the assistant lecturer in the recipient country plays a fundamental part. For example, Koeber *et al.* (2008) note that teaching assistants can turn videoconference sessions into a positive method for enhancing learning when they participate not only in formally overseeing the development of the class, but also when they participate actively in it, i.e. when they become regular players in the formulation of questions, interventions and redirecting the class based on the objectives of the course.

From this perspective, and as was previously said about the comments of dissent made by the students, a decision was made to strengthen the role of the assistant in Bucaramanga, especially to demonstrate the benefits of the initiative to the students in their academic process and to clarify his role as a guide who accompanies students and whose mission is to assist them in their learning and not as the expert on the stand (Palloff and Pratt, 2002). Although initially the assistant lecturer's job was to help coordinate the facilities and the equipment, his role in discussions was valuable a number of times. As other authors have pointed out, the assistant lecturer, as far as possible, can become a guiding agent for the class and participate in it actively. As shown in Figure 3, the assistant lecturer in Bucaramanga, Colombia (standing) participated in the lecture.

Number of students

In recent years, the number of students in videoconferencing sessions has been suggested to have an effect on academic performance. The literature on the influence of the number of students in videoconferencing classes has focused on the fact that student motivation decreases, *inter alia*, if the teacher does not have eye contact with his/her students, that is, when proximity to the student is reduced. Brown *et al.* (2005) examined the level of adaptability of students in videoconference classes with varying numbers of students. The authors put to the test the hypothesis that students with lower motivation would be negatively affected by the use of videoconferencing regardless of class size. On the contrary, high-motivation students would have a positive experience with or without videoconferencing. However, as argued by other authors, decreased motivation is not considered to be an exclusive element in the use of videoconferencing; rather, it has to do with a setting –independently from the teacher's physical presence– which hinders attention and does not facilitate teaching and learning.

In our experience, since the number of students was small, communication was fluent with those attending the sessions, except for the interruptions caused by delays in the signal (as will be explained later). The presence of the assistant lecturer also favoured the process. However, further studies are needed to prove whether the teachers' perception on this matter actually facilitates interaction and how it influences student motivation and learning.

Overcoming technical challenges

Gillies (2008) noted, as disturbing elements for the use of videoconferencing, the presence of technical problems such as delays, background noise, and the limited experience of teachers in the use of this system to cope with and adapt to problems.

These were the technical problems that arose during the semester: time incompatibility in the destination college to book the facilities; low quality of the Internet cable connection (the signal had a 1 or 2 second delay); impossibility of having a specialised classroom for videoconferencing at the beginning of the sessions; inexperience of the lecturer in the use and functionalities of the videoconferencing software; difficulty in student-teacher communication when transmitting and answering questions (to ask or answer questions, students had to come closer to the computer), and the sound coming from the point of origin was not clear enough.

An important element in overcoming interaction problems and technical issues for the following sessions in the semester was the dialogue between the two lecturers, at origin and destination, held at the end of each lecture. During that time, the session was analysed and the necessary adjustments for the following sessions proposed. This series of meetings was also held in non-teaching hours, and some of them also included the Dean.

The lecturers' experience

One of the factors that influence the use of videoconferencing in education is the lack of experience of the staff involved in the videoconferencing process. Yet, Padgham et al. (2005) demonstrated that the implementation of a videoconference process does not necessarily require previous training. Apparently, simple tasks related to the use of videoconferencing may not be essential for video teaching.

The lecturers involved in our study were not experienced in the use of videoconferencing but they gradually adapted to the fact that technical, organisational and pedagogical factors were progressively improved, facilitating both teaching and learning.

3. Conclusions

Videoconference teaching involves changes in terms of the traditional methodology used in face-to-face education systems. It requires different forms of interaction, different verbal and physical behaviour, different ways of presenting information and different ways of interpreting the messages transmitted in both directions. For that reason, it is important for teachers to be trained in this type of system and its technical and organisational elements but, above all, they need to know what pedagogical tools will foster interaction between participants.

For a system to be implemented and applied with good results, the best way is to work on it so that all possibilities can be made the most of and potential problems arise.

Our project reinforced the main elements described in the literature about some of the factors that can positively or negatively affect the videoconferencing process. This educational experience shows that videoconferencing is a process which, despite the practical application of the models described above, does not differ from traditional teaching; its implementation requires a change in formal aspects, but especially a change in the traditional teaching methods used in higher education.

Further research is needed in order to delve into the use of videoconferencing in higher education and its links with the increase in research skills in the teaching of physical culture, sports and recreation sciences. It is also necessary, *inter alia*, to conduct studies where, for example, previous data are obtained on the participants' perception of ICTs prior to the start of the videoconference process.

Finally, the authors of this paper believe that the objective has been achieved in terms of having described an educational experience at university level which laid a communication bridge between two Latin American countries that can and should strengthen their ties of mutual cooperation.

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| How to cite this article

Martínez Bello, Vladimir, et al. (2013). Instruction of a university course by videoconference between two Latin American countries . @tic. revista d'innovació educativa. (nº 11). URL. Accessed, month/day/year.

