Videoconferencing technology in lectures and tutoring

Tove Johannesen[1] & Else Margrethe Eide[2]

[1]Høgskolen i Nord-Trøndelag / State institution in higher education, Faculty of nursing, St.Olavs.gt. 24.
7600 Levanger NORWAY, phone: +47 74 01 29 46 / +47 74 11 20 00, fax: +47 74 01 29 01
[2]Høgskolen i Bodø (Bodoe)/ State institution in higher education, Faculty of nursing, 8002 Bodø (Bodoe)
NORWAY, phone: +47 75 51 75 73 / +47 75 51 72 00, fax: +47 75 51 75 70

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Abstract

The article is based on various reports as well as experience with the use of videoconferencing technology in the areas of teaching, tutoring and professional training of nurses and other professions in the area of health and welfare. The authors of the article have substantial experience as lecturers and academic tutoring in various professions from the foundation level up to post-qualifying in addition to educational programs for Nurses. Web have carried out the projects either by ourselves or with other and now we wish to share the knowledge and experience accumulated through this work with other people.

The Videoconferencing sessions have been both point-to point and multi-point, and various transmission rates have been utilized. The method demands both pedagogical and didactical knowledge in order to be used in structured tutoring and teaching. Tutoring puts high demands on the technology as it implies contact and communication using the entire spectrum of senses. With the rapid technological developments during the last few years, new methods and areas of utilization have emerged in the field of teaching and tutoring. As a result of this, new knowledge and experience can be disseminated and can contribute to an overall increase in quality and general level of knowledge.

Keywords: Videoconferencing, distance learning, flexible learning, tutoring, teaching by using technology, learning activity, motivation.

Introduction

The authors have tried out video-conferencing technology in teaching and tutoring through several projects during the last years. All these projects are encompassed by the term developmental work. These projects are:

1. Pedagogical challenges in relation to distance learning in health profession courses of study. 1994-1995. A co-operative project between " Høgskolene in Bodø, Nord-Trøndelag and Tromsø". This project is a preliminary project for project nr.1.2.
2. Elements of distance learning in nursing education - the development of pedagogical approaches. 1995-1997.
   A co-operative project between "Høgskolene in Bodø, Nord-Trøndelag and Tromsø" concerning the testing and development of new methods in teaching and learning.
3. Tutoring of students in education for the professions, - approach and interaction using the medium of two-way sound/picture. 1995-1997.
   A project directed at tutoring while on placement of both full-time and part -time nursing students at "Høgskolen in Nord-Trøndelag".
4. In- service training of staff in distance learning. 1996-1997
   A co-operative project between Høgskolene in Bodø, Gjøvik and Nord-Trøndelag", directed at the teaching staff at the State Institutions of higher Education concerning new methods of teaching and learning.
5. Tutoring about tutoring using video-conferencing technology. 1997-1998.
   A multi-point tutoring project on the tutoring of nursing subjects at "Høgskolen in Bodø"

The projects have been directed at both various professions in the welfare state and at nurses and nursing students. In this article we will focus on how new technology can contribute to spreading knowledge regardless of the distance to the educational establishment, and also enable the acquisition of knowledge regardless of the distance to the educational establishment, and also enable the acquisition of knowledge regardless of time and space when possible and useful. We will therefore base this presentation on project 4, but will also add to this by using knowledge and experience developed in the other projects.

Our network in this project

The need for training and tuition is large both in urban and rural areas, but it is not always easy to acquire such training and tuition for many different reasons. Today there is a wealth of good subject literature in most fields of study. In this way, the whole thing becomes much more accessible than it was a short time ago. The possibilities therefore exist for presenting knowledge in spite of there being distance between the

teacher and the student. If one couples this technology up to other technical aids and good pedagogy one can obtain well-structured and good training.

One of the main prerequisites is that the subject`s content and objective decide the choice and use of method and technology and not vice-versa. In order to achieve this, the teachers must get to know the new technology, so that they can assess the methods and the technology`s possibilities when the choice is to be taken.

Short presentation of the project

Project 4, "*In-service training in distance learning"* was aimed at the academic staff in the three co-operating State institutions of higher education in Bodø, Gjøvik and Nord-Trøndelag.

The project leaders wished, in co-operation with other State institutions of higher education in Norway and abroad to build up expertise amongst academic staff in order for them to get an overview, insight into, understanding of, and training in tackling the pedagogical challenges induced by the new technology and methods.
There was a wish to be able to demystify and create confidence in the new technology so that the individual could best be able to see the possibilities instead of the limitations.

Various methods of distance teaching were coupled up to video-conferencing technology and tried out in teaching. Up to 8 studios were connected simultaneously and these were located both in Norway and abroad. In addition direct PC-attachment, video, documental camera, LCD-screen and video-canon were used. The PC`s had internet coupling, audio cards and CD-room. Various width of tape (number of channels) were used in the sendings.

The programme was built up on the basis of the four following modules:

Module 1. Internet

- General introduction
- Network building
- E-mail
- World Wide Web
- Videoconferencing on the internet
- Other relevant internet services (FTP, Telnet, News and so on)
- Use of hypertext and building up web pages
- Pedagogical usage. Presentation of experience

Module 2. ISDN - Video-conferencing

- General introduction
- ISDN standard for picture, sound and data
- Available solutions on the market
- Typical development of infrastructure around the standard equipment
- Costs
- Presentation of projects

Module 3. ISDN - Pedagogics

- General introduction
- Speech technique
- The role in front of the camera
- Body language and communication
- Creating dialogue and dynamics

Module 4. Other methods

- General introduction
- Interactive programmes/CD-rom (CBT - Computer based training)
- Teaching videos
- Satellite

The unique thing about this project was that the technical methods and the technical equipment which were being taught about were also used during the course itself. A theme booklet was made for each module.

Carrying out the projects and our experiences

A special group, responsible for each module, was established consisting of colleagues from the three co-operating colleges. Lecturers were recruited internally from the State institutions of higher education or from other education institutions in Norway and abroad. The purpose of the course was, besides learning to use the new technical equipment, to also help increase cooperation internally between various departments in the State institutions of higher education as well as establishing and developing cooperation between the colleagues. We expected to achieve this in a better way by using our own personal. Previous experience has shown that good and exact planning is especially important when the use of technology is required in order to carry out the teaching and/or tutoring. Technology which does not function often leads to dissatisfaction and frustration. When on the other hand it works as it should, it disappears in a way gradually and the content of the teaching or tutoring takes over the central position. Related to video-conferencing technology one almost achieves, under good conditions, a feeling of sitting in the same room.

The first experiences

The first sending was rather experimental. It is unusual for most people to see themselves on the screen.

One also needs time to get acquainted with the technique. Focus was then attempted put on the advantages and limitations of the technology, while at the same time offering the participants the possibility to make their mark and develop self-assurance in the situation. This has to take place under rather strict direction, at any rate in the beginning in order to avoid chaos. Strict direction means good and detailed planning of what is to be carried out and ensuring the chairman`s role. Such strict direction can naturally seem rather a hinder, but experience would suggest that this can be gradually loosened up as confidence in the new situation, the technology and ones' own ability to master it increases. This is the case for both teachers and students. In our culture we are used to looking TV and video, but this happens mostly in entertainment situations where we become passive receivers. When one uses this technique in teaching and learning we think that the assumption should be a greater degree of activity from all parties involved. It is important for the teacher to make the necessary arrangements to ensure that the students are activated right from the start. In this way we reckon that the students feel they own learning, instead of being more or less passive receivers. This fits in well with Bjørgen`s theory maintaining that learning is a process between "the learning person" and "the learning task". In this process the book, the teacher, the group, the visual medium or telephone/fax are merely catalysts in the process. More attention is paid to the students and their various learning prerequisites, in order to better assess how the technical means will help provide a good solution to the learning tasks. The whole thing becomes a meeting and an interaction between teacher and student in which the technology is a means of helping in the interaction. In this way the learning becomes in the last analysis dependent on the receivers' own activity and responsibility.

The influence of bandwith

The quality of sound and picture are connected to the bandwidth (number of channels). There are therefore considerably better conditions with 6 channels than with 2. The difference between 4 and 6 channels is however not so large. Use of 2 channels means that the sound will not be well synchronized with the picture, the facial mimicry can become rather diffuse, and the movements rather jerky. This can be eliminated considerably by the participants being aware of this and adapting to the situation so that there are least possible disturbances. Something can also be done by using neutral patterns and color on furniture and clothes as well as the way one sits and moves in the studio. In this project we always had more than two places/studios connected together simultaneously.
Here we would refer to the network map in the general introduction. We call this multipoint-conferencing. Multipoint-conferencing is carried out by connecting all the participants in an ISDN-bridge. In Norway such a connection is ordered through Telenor and is called a telephone conferencing meeting point or MCU – telephone exchange. This is situated in Bodø. (Bodoe). In multipoint-conferencing the sound directs the picture. This means that the person who at any particular time produces sound will appear on the screen. Unwanted sound such as the scraping of chair legs, losing things on the floor etc. can create disturbances. We experience therefore that it is smart to turn off the microphone when one does not want to be "on the air", in the way eliminating echo in the studios.

Technical problems

There were from time to time technical problems carrying out the project. There could be problems with connections, bad lines, sound and picture problems. It turned out to be easier to accept rather poorer picture quality than sound quality. The technical problems were solved as time went by. We learned to take some precautions which enabled us to identify and solve the problems faster, so that we did not lose as much time. This means amongst other things that all the studios had one another`s telephone numbers available and to the MCU central unit responsible for the linking and transmission. The frustration was thereby eliminated.

During the whole course videoconferencing was used as a classroom for teaching, tutoring and process evaluation of various visual media such as PC, video, CD and videoconferencing technology.

Evaluation

Evaluation of the course both as process evaluation during the course by using conversations with participants and lecturers. The steering group also maintained continual evaluation of the process and one another`s influence on the processes. In addition a final written evaluation was carried out.
By following the process and clearing up challenges and difficulties as they cropped up we obtained good discussions which helped us to assess and change things gradually as it became necessary. In this way we adjusted and hopefully improved the quality of the set-up. The course was well subscribed. At the start there were 60 participants.

Evaluation showed that:

- Motivation to participate in the projects was on the whole good. For some this motivation got better as the time went by. There were also some people who dropped out, but this was mainly due to other reasons. Some new participants also joined the course along the way.
- The dialogue between the involved parties was also evaluated to be good or very good.
- The participants experienced obtaining good contact with teachers and to a certain extent also with those sitting in other studios.
- The participants became interested in cooperating across departments and institution boundaries.
- The participants developed a closer relationship to technology and felt themselves in better shape to see advantages and limitations of the technology.
- Many expressed that they wished to take technology more actively in use and felt more certain of choice of method and equipment.
- The group work functioned poorly in two of the groups. The participants had problems setting aside enough time for their work and thought that this aspect should be more directed by the teachers.
- From time to time the technical equipment created problems as regards connections, sound and lighting.

As the project progressed, things were tried out which turned out not to function as intended.
A certain amount of equipment was acquired during the course of the project. In this way the participants could observe how one could have influence in a given situation and improve the situation.
Not so much structured tutoring was carried out in the project. The project leaders had however obtained

some experience in the use of the same technical equipment for this purpose. This has been documented in the other projects to which we have referred.
Summing up:

- Experience has shown that the possibilities of succeeding with video-conferencing technology in teaching and tutoring definitely exist.
- There will always be a certain danger of the technology getting too much room and distracting attention from the subject matter in question, but this danger can be considerably reduced.
- In order to succeed with many users, the technology must be simple and easy to use.
- There must be time available for planning and experimenting.
- The users must gain insight into the advantages and disadvantages of the method and training in how to reduce or eliminate these disadvantages.
- The method requires stronger direction than ordinary teaching and tutoring - in any case in the beginning.
- At normal meetings, discussions, task-tutoring, simple teaching and similar things two channels function excellently.
- For teaching and tutoring in which one is to assess and play on the whole system of senses there ought to be four or six channels.
- The content and goals of the teaching and tutoring must decide the choice of technology.
- It must also be considered whether video-conferencing as a method should be used exclusively or combined with teaching and tutoring in the same room.

Conclusions

- The technology must be relatively simple and easy to use
- The method demands pedagogical and didactical knowledge
- The teacher needs a basic understanding of the technological possibilities and limitations
- The planning phase is particularly important
- The content and the objectives of the teaching and tutoring must be appropriate decisive for the choice of technology.
- There are great possibilities for success when using videoconferencing technology in tutoring and education.

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