SATELLITE EDUCATION MODEL - WORK ORIENTED PROFESSIONALS FOR HEALTH CARE BY A DISTANCE LEARNING METHOD

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Abstract

According to the Finnish Government's program, the goals of University of Applied Sciences (UAS) are both digitalization and the strengthening of cooperation between universities and work life. Vocational education must be organized according to the needs of the workforce. When education is organized, various online and distance learning models are utilized enabling time- and place-independent learning. The quality of distance learning is based on the authenticity of learning and a good co-operation between UAS and work life.

The distance learning, called as satellite education, was started between Savonia UAS and two central hospitals. Education responded to the labor shortage of central hospitals. Theory lectures of distance learning were implemented through a Zoom video connection and practical training in situ in hospital laboratory.

The aim of this article is to describe satellite education experiences from the perspective of students and teachers.

The materials were collected through interviews and a theme questionnaire and analyzed by a content analysis.

According to the students, the success of distance learning and especially video connection teaching requires 1) familiarization 2) study motivation 3) self-discipline and concentration 4) appropriate equipment 5) interaction between students and teachers and 6) IT support.

The teachers emphasized the importance of familiarizing process of the method, interaction between teachers and students, sufficient IT support and students´ skills of distance learning.

In summary, distance learning in an authentic hospital setting is effective. Health care professionals bring their own expertise into a learning process. The challenges of distance education are very similar to both teachers and students.

The satellite education model was further developed based on the feedback. XR-technology was added as a part to the satellite education. A new environment is under testing.

Key words: *Satellite education, distance learning, video connection, hospital laboratory, co-operation*

1. INTRODUCTION

Employment in Finland has increased in recent years, but compared to the situation in all the Nordic countries, Finland still has the highest employment rate of about 72 %. Although employment has improved, at the same time there is a shortage of labor in various regions of Finland. About 100-120 biomedical laboratory scientists (BMLS) graduate annually from six Universities of Applied Sciences (UAS). The annual number of graduated students in BMLS is not enough to cover the need of health care (1). Particularly, the promotion of employment requires a strong investment in education and skills.

In Finland, one of the top education projects of Government Program (2019) is both digitalization and the strengthening of the cooperation between universities and work life (2). In addition, in other European countries, digitalization and education, as well as access to education, have been set as one of the most important priorities (3).

The demands and needs of the constantly developing and digitalizing work life increase the need to update the skills of existing employees. Continuous learning requires a more flexible and student-oriented training not only for professionals but also for health care students. The satellite education model enables the combination of new teaching technologies and digitalization. The time- and place-independent and accessible education model increases the attractiveness of education and willingness to apply to the education.

According to the Act of University of Applied Sciences, the task of the Finnish UASs is to provide work-orientated training for the tasks of professionals (4). The activities of higher education institutions require close dialogue and co-operation with work life. In accordance with labor needs, distance and satellite education models were utilized in Finland and education exported to areas where no local education exists. One of the quality factors of teaching is considered to be the authenticity of learning, which is enabled by the close interaction between the educational organization and work life. Authenticity is realized by the authentic experiences in work life and the cooperation of education with work life professionals. The satellite education model, which was built in the context of work life, offers a good opportunity for cooperation between students, teachers and work life professionals (5).

1.1 Implementation of the satellite education model

The distance learning, called as satellite education, was started between Savonia UAS and two central hospitals. Education responded to the labor shortage of BMLS. The attractiveness of satellite education was facilitated by the possibility of the hospital laboratory to employ all graduated students. Distance learning groups studied and practiced in hospital laboratories and participated in theory lessons via Zoom -video connections. The students participated in the theory lessons simultaneously from different campuses (Figure 1). The satellite education pilot emphasized the close co-operation between the hospitals and Savonia UAS.

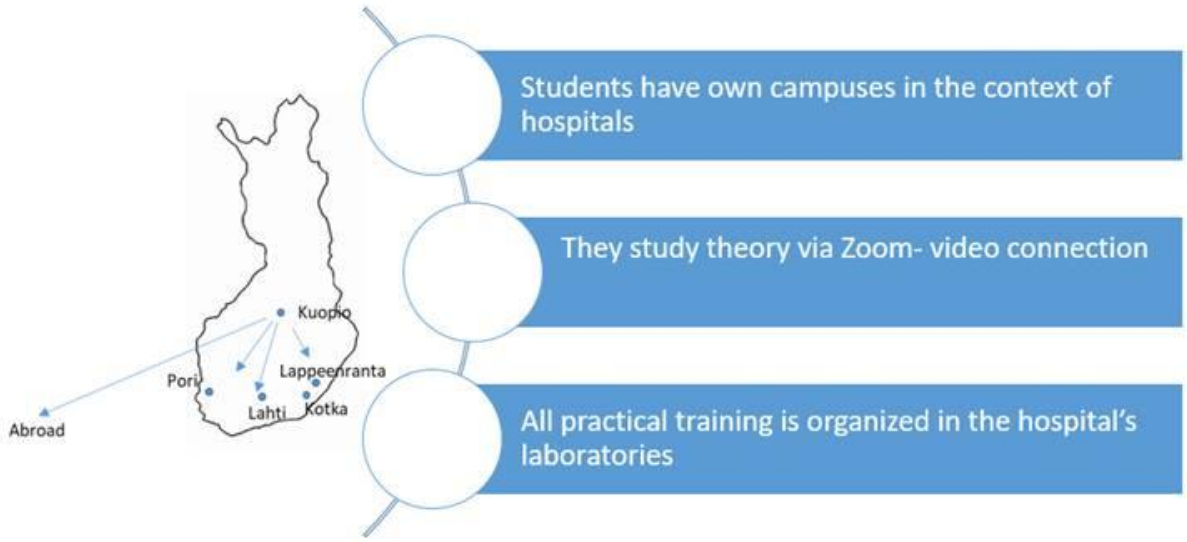


Figure 1. Satellite education model. The main campus of Savonia UAS is located in Kuopio. The satellite campuses were located in the context of central hospitals. The satellite education model also enables the export of education abroad. (photo by Anssi Mähönen)

BMLS education includes 210 ECTS, which consist of 135 ECTS of theoretical studies and about 75 ECTS of practical training together. The whole degree program takes 3.5 years. Moodle was used as an e-learning environment. The instructions in Moodle include texts, images, videos and links to different kind of information sources. Theoretical studies in the courses take place through remote connections (Zoom-video connection) and Moodle. The teachers were working in the class rooms of Savonia UAS

together with a traditional student group and the students of satellite education on the premises of hospitals.

A personal study and career plan (PSP) was made for both the traditional classroom student group and the students of satellite education. The PSP is a roadmap, which combines the objectives of the degree program, a student's personal interests and study choices as well as his/her career prospects. The PSP is created, and stored in Wilma, the electronic student administration system. The implementation guidance course for PSP can be found in Moodle. An annual PSP discussion is arranged between a student and his/her tutor teacher. It is a combination of a counselling appointment and an appraisal, in which the tutor teacher guides the student to assess his/her learning outcomes and progress in studies. In addition, the students of satellite education have designated mentors from the hospital staff who have been trained and introduced by Savonia to support the study of satellite students.

In case of practical training of the satellite students related to the ongoing courses, the teachers moved to the hospital laboratories of satellite campuses where the practical training was carried out. In addition, the students also practiced under the guidance of hospital laboratory staff. The staff had been instructed to guide the practical training of students. The practical internships included in the study were carried out on the premises of hospitals.

Savonia UAS and the hospitals involved in the satellite education signed a co-operation agreement, where the responsibilities and obligations of both parties were described. Savonia UAS was responsible for curriculum, tasks related to education and pedagogical implementations and the graduation certificate whereas the hospitals were responsible for facilities, equipment, student guidance and practical internships. In addition, a steering group was set up to monitor and develop the training. The steering group consists of those responsible for education and working life, as well as student members.

During the first implementation of the education, the experiences gained from the training were studied from the point of view of students, teachers and staff involved in the guidance of hospitals and those in charge. This article describes the experiences gained from education from the perspective of students and teachers.

2. MATERIAL AND METHODS

The purpose of the study was to describe the students´ and teachers´ experiences of the satellite education and as well suggestions for the development of distance education. Teachers' experiences of implementing satellite education were investigated in Oikkonen's (2015) Master's thesis (6) at the University of Eastern Finland. This study focused on the early stages of satellite education and was carried out at end of the first academic year. The material was collected through a group interview. In this interview, the teachers described the planning phase of satellite education, the teacher's role in education implementation, the need for support in teaching, and the need for support in learning. Nine teachers of Savonia UAS who had taught in the satellite education model were selected to a small group interview. The data was analyzed by an inductive content analysis (7).

Similarly, a thematic survey was conducted with students who have studied two years in the satellite education model. The aim of the study was to obtain information about the experiences of the satellite education, the implementation of education and studying via a video connection.

The research material was collected with a Webropol thematic questionnaire containing five different open questions. The students were asked to describe the reasons for applying to satellite education, their experiences of teaching arrangements, distance learning in general, and especially teaching via video connection. The questionnaire was sent to all students studying on the satellite campuses. The response time to the questionnaire was two weeks. 16 students responded to the questionnaire. The response rate was 57%. Even though the response rate was low, the answers were rich and diverse in content. The material was analyzed using content analysis.

3. RESULTS

3.1. Satellite education model improves teachers´ pedagogical and technical skills

When Savonia UAS started the co-operation with hospitals and the implementation of distance education in autumn 2014, the whole education method was novel and not implemented in Finland before. Therefore, teachers did not have any experience of distance learning.

According to the teachers, co-operation with the partners of work life required continuing dialogue and joint planning to achieve a common pedagogical opinion and plan. The teachers stated that all information related to the planning of distance learning and operating methods should be freely available between all parties. This would ensure that everyone is committed to the implementation of a new education method.

The teachers' opinion was that teaching technology and pedagogy must be well planned before starting education. It is important that distance learning tools and equipment technology support learning and teaching. An example of this is that it depends on the placement and orientation of the camera in the classroom how well the teacher sees the satellite students on the satellite campuses. The misplacement of cameras and monitors makes the teacher feel restless. In any case teachers should follow several monitors at the same time. High sound quality of the speakers and microphone is also important for successful teaching. The use of new technologies challenges the coping of both teachers and students, as well as e-learning and teaching skills. Students must be able to follow the teaching remotely for several hours at a time. Especially for coping, the correct placement of the equipment and their functionality are important. Inadequate e-learning and teaching skills complicate the distance learning and learning process. At the beginning of education, it is important that satellite students and teachers are guided on how to implement satellite education.

In classroom teaching, non-verbal communication tells a lot of about learning, but in distance learning, this possibility often does not exist. Expressions and gestures are not always transmitted online and teachers are unsure about students´ learning. The teachers described that it is challenging to observe and pay attention to simultaneously both the satellite students and classroom students. Support for satellite students may easily be less than support for students in the classroom. It is possible that a satellite student may need guidance, but teachers cannot recognize it because of the remote connection. Equal support and guidance for all students is considered important to promote students´ learning. Teachers should be able to motivate students to use their own abilities in learning process. In the teachers' opinion, satellite students should be self-directed and self-initiated in their studies.

According to the teachers, getting to know the students makes the teaching more meaningful and facilitates later interaction with them. The face-to-face meetings and practice *in situ* on satellite campuses help the teacher get to know the students better. This also makes easier to guide the whole study process.

Cooperation with a work life partner in the planning and implementation of satellite education is particularly important. At the very beginning of the studies, satellite students receive a connection to work life and get current information about working in their profession. In this way, students commit to the education right at the beginning of their studies. It is important for teachers to recognize the difference of learning environment of students on the satellite campuses compared to students of classical teaching environment at Savonia UAS. The different starting points of different student groups should be taken into account and the work life oriented education model utilized for all teaching groups. In addition, mentors from work life organizations should have dialogue between work life and education and monitor the process of studies of satellite students as well as support them.

3.2. Satellite students are required to have motivation, self-discipline and the ability to concentrate

Students studying on the satellite campuses of the hospitals had applied to education with the aim of better employment and a new profession in future. The students were especially pleased that it was

possible to study in their own district via video connections. Only one of the students had previous experience of distance learning.

During the first week of study, the students were introduced to videoconferencing and later to the use of video connection equipment in hospitals. Some felt that they had received enough orientation whereas others wished to have even more of it. Despite the good introduction, technical problems still occurred, for example, when a student wanted to share and present his or her own learning tasks via video connection to the others on the other campuses.

The students who responded to the questionnaire survey felt that the video-mediated teaching went smoothly and they were satisfied with the arrangements. Teaching requires both the teacher and the student a different orientation to teaching and learning. In traditional classroom teaching the teacher and the students are in the same place whereas in the satellite education model there could be several campuses at the same time and therefore the orientation has to include different perspectives.

The content analysis showed six different prerequisites for video connection teaching and its success. The prerequisites are **1) good orientation to the satellite education model, 2) motivation to study, 3) self-discipline and ability to concentrate, 4) functionality of video connection equipment, 5) good interaction between students and teachers and 6) effective IT-support.**

Before starting video connection learning, both teachers and students need to be well oriented to the use of video connection equipment. In the education model where the teacher is not concretely and physically present, constant observation of the screen requires the student a strong motivation and interest to study. In addition, it was found that good self-discipline and the ability to concentrate are essential in following distance lectures. The students described video connection teaching from the perspectives of motivation and concentration, e.g. as follows:

"Video connection teaching requires a completely different ability to concentrate than traditional lecturing"

"Video connection teaching requires more self-discipline, attention is lost more easily"

"You always have to motivate yourself to follow the lecture"

A few students described the interaction as challenging from both the teacher and student perspective. Teachers and students should see each other all the time. In particular, students want more "encounters" and that the teacher's facial expressions and gestures are visible when he or she presents things. When the students do not see the teacher, they cannot raise their hand if they want to ask clarification for something but have to ask their case loudly and interrupt teaching. This in turn may distract other students in the classroom. As video teaching progressed, the students and teachers learned to know each other better and in this way the communication became easier. In the survey, the students described the adequacy or inadequacy of interaction and encounters, e.g. by the following expressions:

"I have quite a few teacher-student encounters, there is no eye contact and the teacher is not always visible"

"Meeting teachers and students via video connection is now easier because we know teachers and they know and see me".

The functionality of the devices and the control of their technical use are important in video connection teaching. The students most often described video-mediated teaching as functional, and in the case of problems, "IT support and student tutors solve problems". In the beginning, the students had felt that teaching technology was under testing and building and the new method was just introduced. The continuous video connection between Savonia UAS and the hospital campuses was actually a new thing and settled down in the autumn of 2014. As a problem on the satellite campuses, the students experienced e.g. the screen of the satellite campus was too small. There was a need for a larger screen that could be divided, or two screens, one showing the presenter and the other his or her presentation. In addition, the placement of the microphones and speakers is the starting point for good audibility, and their good placement facilitates learning. IT support and access to helpdesk are considered to be important. The students who responded to the questions about the technical problems thought that they

had received help and support quickly. After one and a half year, the teachers and students who were familiar with and trained in the video teaching method were able to use the equipment smoothly. On the other hand, the skills of new teachers were not always sufficient for a smooth use, and therefore the students felt that new teachers need more orientation.

The students had been pleased with the opportunity to study in their own community and they see the satellite education model as a good alternative to the traditional full-time and classroom study.

"As such, it is a surprise to me how easily the studies has gone despite the video connection. It is almost like sitting in Kuopio. "

The students were mainly satisfied with the video connection teaching facilities provided them by the hospitals of the satellite campuses. Some felt that distance learning and video connection teaching even increased their motivation. The students described their support for each other. They also grouped up well. A student described his motivation as follows:

"Motivation comes from interest in education"

The study model where learning tasks are done during the lessons promotes coping and concentration. A pleasant study space, a peaceful and work-oriented learning environment and group support were described as things that promote learning. An important improvement during the study was the organization of group tutoring lessons separately for the satellite education students, so that they had the opportunity to ask questions related to studying.

Attitudes towards distance learning vary from one student to another. For students who are oriented towards independent study, it does not matter whether the teacher is present in the classroom or via video connection. Some students found it difficult to learn if a teacher is not present in the classroom. In distance learning, you usually have to take more responsibility for your own studies because there is less interaction with the teachers and the tutors.

Most of the students feel that the video connection teaching carried out by Savonia UAS enables them to find a new profession, better employment, and study in their hometown. The students suggested that video connection teaching should be introduced more widely, although the method still needs to be developed.

4. SUMMARY

Teachers noted that teaching technology has developed rapidly in recent years and its use has become everyday life in health education and learning at Savonia UAS. The transition from classical classroom teaching to satellite education force teachers to reflect on their teaching methods, practices and skills. What works in classroom teaching as such is not necessarily transferable to distance learning. Because of these significant changes in teaching, it would be good to give teachers the opportunity in a favorable environment to question and reflect their own practices and pedagogical possibilities together with colleagues. Teachers need training in the use of technology and the use of new pedagogical models. According to teachers, mastery of technology and pedagogy is a prerequisite for meaningful distance learning.

In summary, cooperation between Savonia UAS and hospitals enable to study simultaneously on three different campuses. The students are mainly satisfied with the near-working satellite education organized by Savonia UAS and hospitals. Based on the survey, a good introduction to the devices, and how they work should be ensured for both teachers and students before teaching begins. Devices should be interoperable, and IT support should always be readily available. Video connection teaching requires the student to be motivated, self-disciplined, and focused on listening to a lecture or other presentation. Attention must also be paid to the interaction between the teacher and the satellite student, so that the student in the remote group does not feel to be an outsider.

According to the teachers' experiences, the planning of education in the context of work life required a different orientation to the starting and planning of education than traditional classroom education. In

classroom teaching, educational organizations play a key role in organizing and implementing the education. In satellite education, both the educational organization and work life together arrange the education. The daily challenges of satellite education are the same as in classroom teaching: interaction, motivation and activation of students, but the ways of working and implementing are only different (8). In general, the teachers found group learning in an authentic hospital environment meaningful. Teachers would like to challenge the staff of work life to bring in their own viewpoints to the curriculum and the implementation of education.

The views of the students are almost the same as those of the teachers. In the interviews, the teachers also emphasized the importance of being acquainted with the video connection method and equipment. In addition, interaction between students and teachers, technical support, as well as students' distance learning skills are essential. A difference, based on the survey, was that teachers emphasize good planning, whereas students their own motivation. Everyone can influence those things.

The key to the success is that teachers and students will get more tutoring and support with the equipment and they know how to get the full benefit from the provided opportunities. Environment should be arranged to be as calm and noiseless as possible. The students also came up with the idea of acquiring a camera following the movement so that teachers can move more freely as they teach. It would ensure that students could see the teacher constantly. More attention should also be paid to the interaction between the teacher and the satellite students.

In the autumn of 2020, the third satellite training groups will start, and the training has already expanded to more locations. Satellite education is well established and it works well. Video connection equipment have evolved and allow now for better interaction between students and teachers. Equipment and video connection work and teachers know how to use the equipment. In addition, new classrooms dedicated especially to satellite education have been built at Savonia UAS. Young people use various social media applications very fluently in their free time. Utilizing their skills in distance learning would be highly desirable.

Learning environments and materials have evolved. Teachers are working on distance, teaching materials enabling time- and place-independent learning for students and a way to study regardless of the life situation. The ongoing FutureEdu-project is further developing the satellite education model. In this project a virtual work life -oriented learning environment is created where students can study in an authentic and work life -oriented environment. Students can familiarize themselves with their hospital internship at home in advance and do their assignments in virtual environments before moving to practice in a real hospital environment. Furthermore, during the lessons it is possible to do live visits to work life environment. These live visits enable to follow the ongoing processes and methods carried out by a professional in hospital.

In this way, education and work life promote and support the student's learning process and offer them better knowledge of work life. Virtual technology also enables studying for a person who cannot participate in classroom teaching. Some students may study traditionally in the classroom, others may study in virtual environments, depending on e.g. their own life situation.

Savonia has been fortunate to get educational partners like hospitals. This cooperation enabled to develop the satellite education model. In the ongoing FutureEdu-project the satellite education model was further developed together with the same work life collaborators. The best thing about this co-operation model is co-development which benefits both the educational institution and work life.

The produced satellite education model has enabled Savonia University of Applied Sciences to move smoothly to online education during the COVID-19 pandemic, which temporarily closed the universities in the spring of 2020. This new distance learning model is ready for use and enables continuing education in exceptional circumstances.

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