Adopting digital skills in an international project in teacher education

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Abstract

The aim of the CoTech project was to develop a concept of using ICT tools for international cooperation in teacher education, and the output result was to develop and test a pilot project for an online course. Our pilot shows that it is possible to implement an integrated curriculum using a variety of ICT tools for the development and deployment of video-based learning resources, as well as collaboration between international groups of students in teacher education without these students meeting physically or using coeducation. At each location, it is important to provide training in the appropriate ICT tools to be used.

Keywords: teacher education, digital tools, international collaboration, pedagogical videos, blog, peer assessment

Introduction

The university college programme for teacher training for primary schools (GLU 1-7) in Norway has national learning objectives for student competence on internationalization and digital skills. The challenge is that those learning objectives are overall goals, and they are not linked to any specific subject.
A requirement in internationalization is that "the candidate can contribute to strengthening the international and multicultural dimensions of the school's work" (Kunnskapsdepartementet, 2010). Furthermore, "the teacher education institutions should facilitate an international semester and international perspectives in primary education" (ibid). The objectives in Europe 2020 (European Commission, Youth on the Move, 2012) have a focus on student mobility and internationalization. Within the seven flagships of the EU2020 is the goal of "Youth on the way", with a goal that 20% of the youth cohort will have participated in an exchange with another country in Europe.

Digital competence in Norwegian schools has been a focus for the last 30 years. In the new curriculum for GLU 1-7 are learning demands that "the candidate has knowledge of working with the pupils' basic skills in using digital tools in and across disciplines" (Kunnskapsdepartementet, 2010). To have relevant digital skills, knowledge and attitude are defined as one of the five basic skills, with the other four being reading, speaking, writing and mathematics.

The CoTech project

The aim of the CoTech project was to develop a concept of using ICT tools for international cooperation in teacher education (CoTech, 2011). The output result of the project was to develop and test a pilot project for an online course with the following learning outcomes:

- Students will use collaborative technologies to develop digital learning resources within a specific theme and use English as their working language.
- Students should become familiar with the pedagogical aspects of e-learning as a pedagogical method.
- Students will reflect on their own experiences with the use of collaboration technology for virtual collaboration.
- Students should be able to use technology to extend their cultural and communicative competence in an international relationship.

CoTech is an acronym for Collaboration Technologies in Education. The project was funded through Nordplus and implemented in the period from June 2010 to September 2011. The three partners in the project were Haapsalu Kolledz in Estonia, UC Nord-Trøndelag in Norway and UC Southern Denmark. The project involved 12 teachers and one class of students from each institution. Haapsalu Kolledz had the role as project manager.

The participating students had three main requirements for their work in the CoTech project:
1. The students presented themselves and their own expectations for the learning outcomes in a blog.
2. Internal groups of students developed a video-based learning resource that was published on the project's publication channel on YouTube.
3. The establishment of international groups with participants from at least two institutions. Each international group should peer assess three video-based learning resources based on specific criteria and write a joint evaluation. The groups used Skype and e-mail to coordinate evaluations, and tools such as Etherpad and Google docs for designing the report. The reports were published on the blog from the students involved in the peer assessment.

In Norway, the project activities were primarily linked to the subject of English, and this also provided feedback to students on the linguistic performance of the project work.

Expected ICT skills for international school projects

Öztok and Özden (2007) have investigated how different types of ICT skills are used in Comenius, Word Links and e-twinning projects, and give advice of what is expected of ICT skills for those who will participate in similar projects. They found that the participants in the projects have used word processing tools, spreadsheets, presentation tools, messaging systems, e-mail, CD technology, digital cameras, scanners, web-publishing tools and imaging applications. Most of these ICT tools were also relevant for the CoTech project. In addition, we introduced web conference systems and collaborative word processing tools such as Google docs for the implementation of digital collaboration.

The survey of digital status in higher education in Norway (Ørnes et al., 2011, page 94) found that students are concerned with digital collaboration in educational settings, and that use of this form of study activities gives a deeper learning and quality to the study programme. Relevant tools for digital collaboration and communication are e-mail, social networks, forum, Wiki and blog. The survey (ibid) concludes that 85% of the students use e-mail each week or more often, 60% use the student's social network each month for the purpose of study and 43% share study-related content on social networks. The

survey also reports that just 10% of the students use tools such as blog and Wiki for study purposes each month.

In Nord-Trøndelag County, all students from age 16-19 get their own PC for study purposes. Those students are now in a university college study programme with a lot of experience of using computers and expectations for using computers in the study programme for teacher education. For some categories of software, they are skilled users categorized as being equal to or above a level three in Competence, according to Dreyfus' (1998) five levels of user competence. They have done a lot of schoolwork with writing, presentations and collaborative activities with each other (Egeberg et al., 2012, page 108), while for other categories of software, they have a more limited competence, being categorized as beginners.

Research question

How can an international student collaborative digital project give relevant digital competence to students in teacher education?

The research process

The CoTech project was a case study with the duration of a one academic year pilot study, which was completed in the academic year 2010/2011. Case studies are characterized by "a research programme aimed at obtaining much information from a few units or cases" (Askheim & Grenness, 2008). Furthermore, Askheim and Grenness (2008) support Yin (1994) in these five key components in the implementation of case studies:

1. "Case studies are proper when it comes to providing answers to how and why questions." Our research question in the article is formulated as a "how-to" question.
2. "Theoretical assumptions are similar to hypotheses in quantitative research design, but are looser in form and not necessarily derived from the theory." Examples of such theoretical assumptions in our project are:
    a. Can international cooperation between students be carried out only by means of collaborative technologies, and without an introductory physical meeting?
    b. Do the level of organization and the facilitation of cooperation have any effects on participation and activity in the international groups?
3. "Analysis Units can be both individual and social settings." Our case study had a student group in each country, and they followed different academic programmes. Additionally, the project group of staff members had different backgrounds and roles in the project.
4. "The importance of the logical connection between the data we collect and our theoretical assumptions."
5. "The findings interpretations must be based on the four components mentioned above and from what is available in existing theory in the field.

From an empirical perspective, this provides only the experience from the first project implementation. The results from this project give no reason for generalization, but can bring relevant experience to similar projects and research in this field. The students involved in the project consisted of 20 Norwegian first-year students from GLU 1-7 and 17 Estonian final-year students in Estonian teacher education. The Danish students were fall semester students from a postgraduate course in ICT and learning. Due to an illness for the instructor, there were seven different Danish students and teachers involved in the project in the spring of 2011.

The data for the project are the students' blogs, video presentations, reflections and a final evaluation upon completion of the academic year 2010/2011. The project also involved 12 teachers from different subjects and disciplines at the

three participating institutions. Teachers had three seminars during the project. The first seminar was at UC Nord-Trøndelag in September 2010, with the primary focus for the first seminar being to schedule and make relevant tasks for the student activity in the project. The second seminar was at UC South Denmark in January 2011. Evaluation and review of the schedule and student tasks was the main agenda for the second seminar. In the final seminar, which took place in Estonia in June 2011, the project was evaluated and we prepared the final report. There were also monthly follow-up meetings using Skype (voice/video/chat) and Etherpad (agenda and online notes and report from the meetings).

We conducted a survey of the various project activities after the completion of the course, which was answered by a total of 22 students, 16 from Norway and 6 from Estonia. No Danish students completed the questionnaire.

Theory

Our approach focuses on the adoption of new technology for students and teachers based on Hooper and Rieber (1995), who explained that The Familiarization phase is concerned with the student's initial exposure to and experience with a technology. For our project, the student met some of the ICT tools for the first time, which was their first experience in using them.

The Utilization phase occurs when the teacher uses the technology or innovation in the classroom (Hooper and Rieber, 1995). Teachers who progress only to this phase will probably discard the technology at the first sign of trouble because they have made no commitment to it, and there would be no negative consequences if the technology were taken away. For our project, this was the first time they actually used some of the technologies for teaching purposes. With regard to communication purposes, some of the students were probably more advanced and frequent users of the technologies that were introduced.
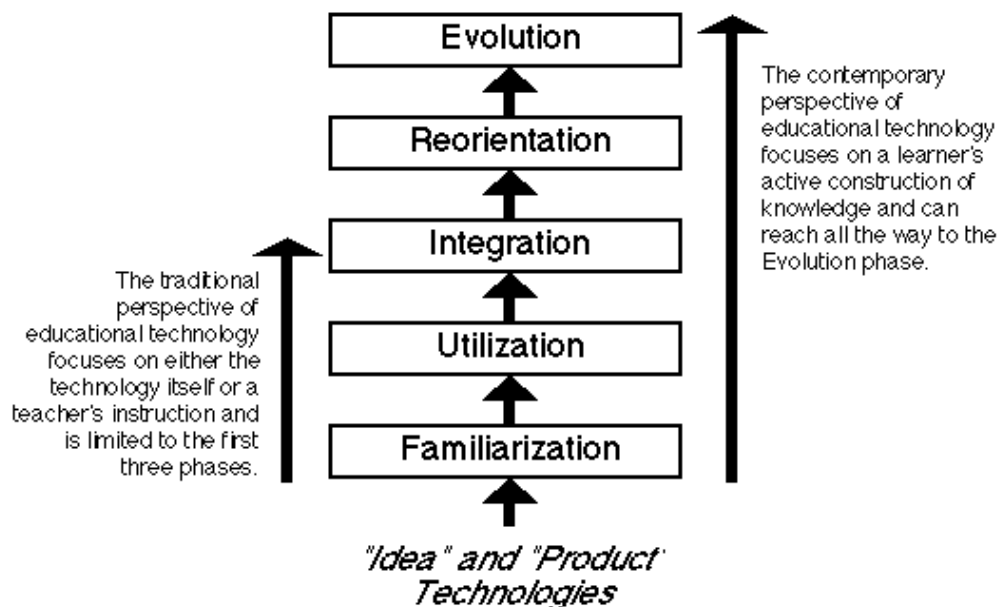

Figure 1: A model of adoption of both idea and product technologies in education (Hooper and Rieber, 1995)

The Integration phase represents the "breakthrough" phase. Hooper and Rieber (1995) explain that this occurs when a teacher consciously decides to designate certain tasks and responsibilities to the technology, and a teacher who reached this phase would find it extremely difficult to teach without it.

Further on, the Reorientation phase requires that educators to reconsider and reconceptualize the purpose and function of the classroom. As opposed to the teacher's instruction, the most important characteristic is that the focus of the classroom is now centred on students' learning. For our project, it was important to involve the students in making use of technology to help produce a common international report from the project.

Results from our case study

To investigate the change of ICT-competence among the students, we conducted a survey at the end of the course. The questions were mainly related to the individual tasks in the project, as well as various digital tools. Most of the questions were formulated based on the student's perceived learning effect: "To what degree did you learn new knowledge and practices in the implementation of the specific task?" The response options were distributed on a six-point scale from "1: not at all" to "6: to a large extent".

Blog task and competence
The first task was to make a self-presentation in English on the project blog. The students had to set up their own blog environment, and they received a few keywords for their presentation. In the survey, we asked them: *To what degree did you learn new knowledge and practices during the blog task (creating a self-presentation)?* Nearly 80% answered category 3 or 4, with just 5% answering "not at all", which indicates that very few of the students had a relevant competence in creating and using blog tools before this task. This is also similar to findings by Ørnes et al. (2011), in which it was found that only 10% of the students used blogs for study purposes in 2011.

From the perspectives of Hooper and Rieber (1995), the blog task was in the Familiarization phase for most of the students.
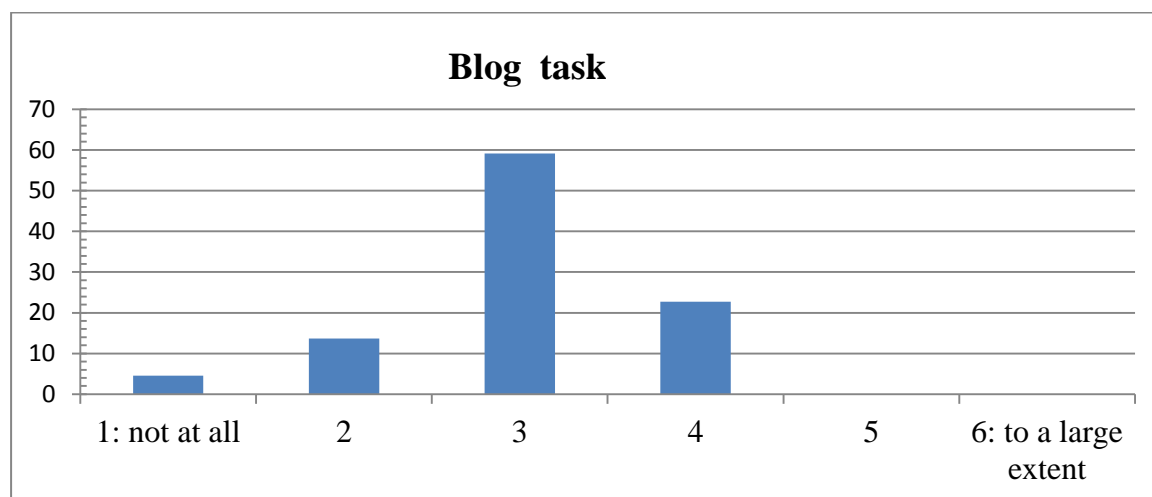

Figure 2: Learning effect of a blog task in teacher education (%)

Video task and competence

The next task was a group project in which the task was to make a pedagogical video for use in a topic for students aged 10-14. First, they had to create their own manuscript and design the video, and then make the video and publish it on YouTube. The project had established its own YouTube channel for the students (http://www.youtube.com/cotech2011).

In the survey, we asked them: *To what degree did the video task (creating an educational video) and activities expose you to new knowledge and practices?* For this question, we received answers in all categories. Only 18% of

the students gave a score in categories 1 and 2 for their own competence development on this task, while 25% gave a score in categories 5 and 6 for this task. This indicates that most of the students were not familiar with how to make and publish a video, which nevertheless should be a reasonable task in teacher education.

Related to Hooper and Rieber (1995), most of the students were in the Familiarization phase of adopting the technology for the video task.
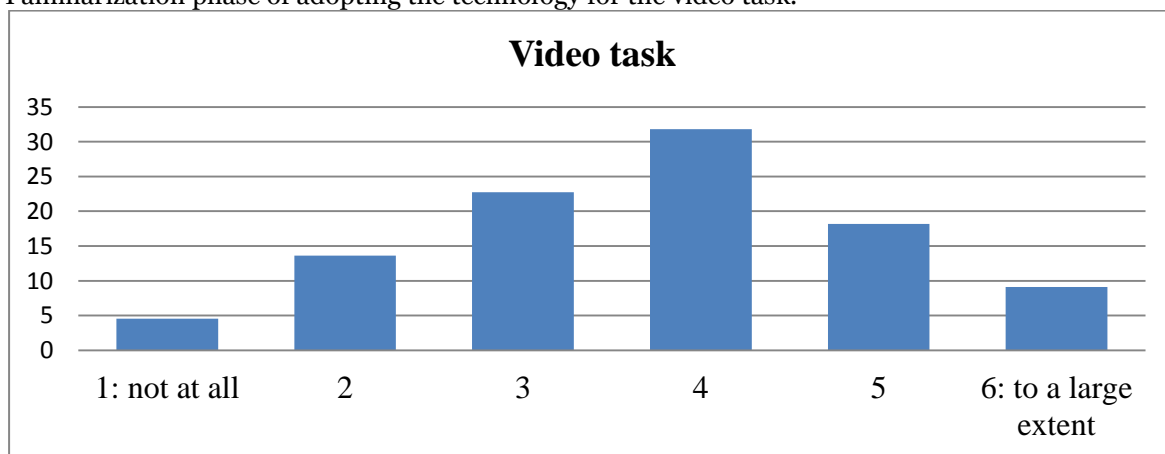

Figure 3: Learning effect of a video making task in teacher education (%)

Using communication technology and making a common peer assessment

We set up international groups with five participants in each group, with all three locations represented. The purpose of the international group was to create a common report for the peer assessment of three videos made by other students in the project. We published a limited evaluation framework for peer assessment work, and the students had to use communication technology to plan the work and share the common report process. For the digital group process, we had to use communication technology such as e-mail, Skype and instant messaging, and we also introduced easy editing tools, e.g. Type-with-me and Etherpad, for the writing process. To help plan the first meeting, we also introduced Doodle as a tool for scheduling a time to meet.

For some groups, the tutor set up the first meeting of the student group using e-mail, and facilitated the meeting by using Skype. Our experience was that those groups had an easier start with the process than those groups which had to make this initial group establishment process on their own. At the very least, we should give a specific student the task of establishing the group communication process.

In the survey we asked the students, *"To what degree did the collaboration task (working in an international group) and activities expose you to new knowledge and practices?"*

The student response revealed that they are familiar with digital communication tools, as 55% of the students put this in category 1 or 2, with 32% responding in category 3. Ørnes et al. (2011) also found that the students are familiar with tools for digital collaboration and communication.
From the adoption aspects of Hooper and Rieber (1995), many students are already in the Integration phase for their own use of those tools, and will easily adopt this for educational purposes.
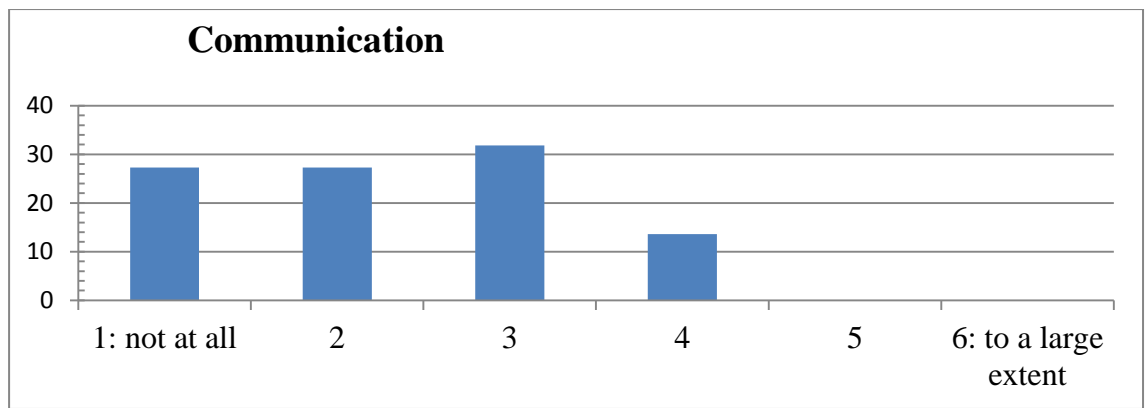
Figure 4: Learning effect of introducing communication technology in teacher education (%)

Common report

The last task was to make a common report by using peer assessment for the evaluation of videos made in the earlier task in the project. For this task, we presented some common criteria for the peer assessment based on three dimensions: educational, technical and English as a second language (CoTech, 2011b). Moreover, we also gave an e-learning introduction for some adequate tools for common writing.

For this task we asked them, *"To what degree did the report task (creating a joint report using collaborative tools like Google docs, Typewith.me) and activities expose you to new knowledge and practices?*

The answers demonstrated that this was new to many students. Sixty percent chose category 4 or 5 on this activity, while just 20% chose category 1 or 2, thus indicating a low level of new knowledge and practice.

Related to the adoption model of Hooper and Rieber (1995), the task of using digital tools for a common report is in the Familiarization phase.
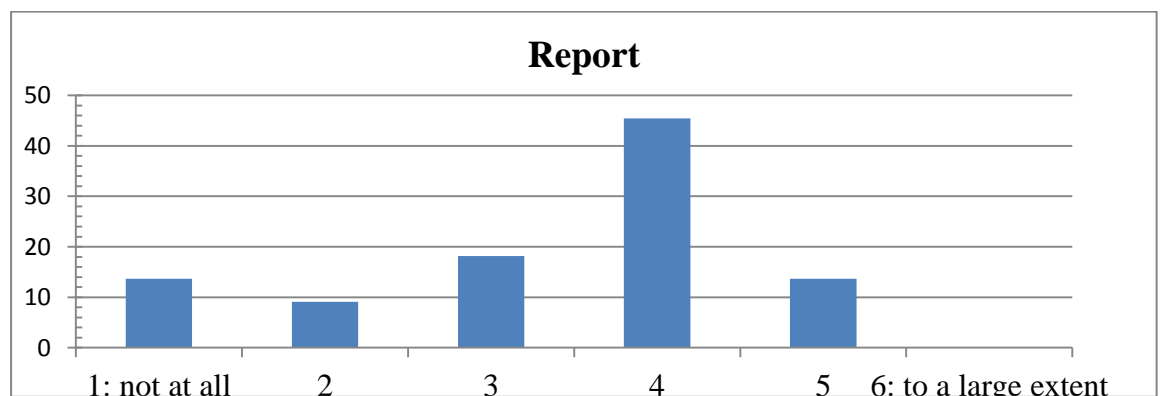

Figure 5: Learning effect of making an international peer assessment report (%)

Competence improvement

We also asked the students to range their digital competence, both before and after this project, using a six-level scale from Beginner to Expert. The categories of user competence were inspired by Dreyfus (1998), who used a five-point scale, with novice as a starting point. The other levels are Advanced Beginner, Competence, Proficiency and Expertise, which is the highest level.

Before the project, the students categorized their digital competence as mostly Advanced beginners (42%) and 51% as Competent Users at level 3 and 4.
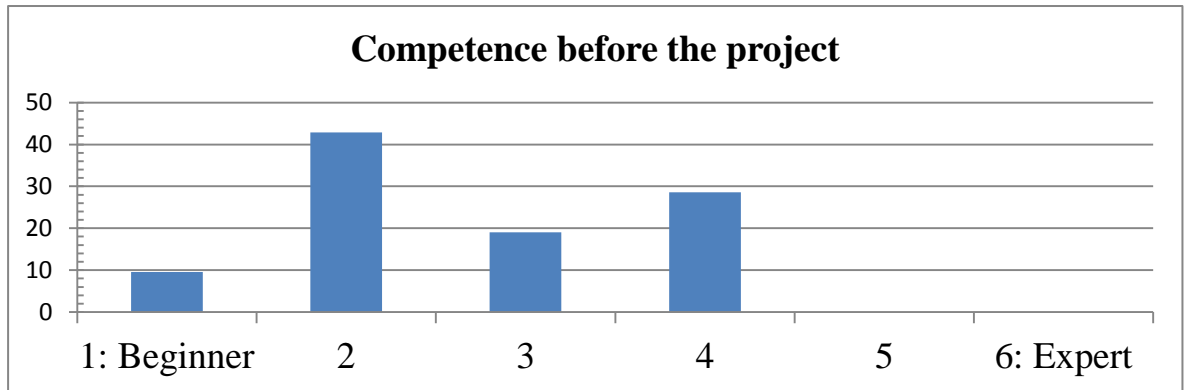

Figure 6: Digital competence of students in teacher education (%)

After the project, the students reported a higher digital competence, with 55% categorizing themselves at level 4 (High Competence/Proficiency) and 36% at level 3 (High Competence).

An optimistic view is that this project gave enough digital competence to the students to enable them to implement their own international e-twinning project with groups of pupils from schools abroad, which can be categorized as the Utilization phase (Hooper and Rieber, 1995).
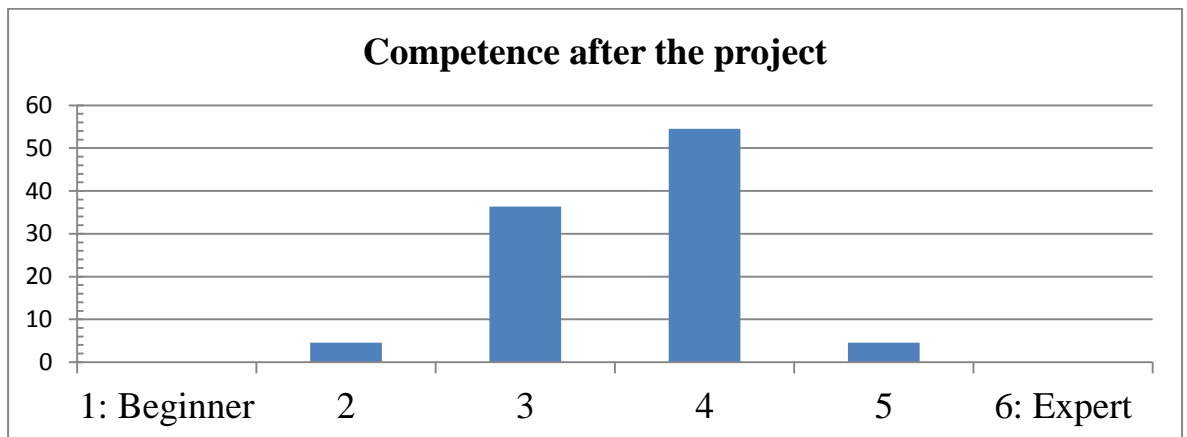

Figure 7: Digital competence of students in teacher education after the project (%)

Conclusion

The CoTech project shows that it is possible to implement an integrated curriculum using a variety of ICT tools for the development and deployment of video-based learning resources and collaboration between international classes of students in teacher education without such classes meeting physically or co-educationally. At each location, adequate training should be provided for the appropriate ICT tools to be used. The project participants can publish presentations, videos and peer assessments via a common Web-based service, in which access can be adjusted as needed. Blogs, Wikis and YouTube were used in the pilot implementation.

Most of the students report a positive learning outcome for tasks using blogs, video making and writing a common report within an international student

group. Through this project, they reported a better competence in using ICT tools, and were motivated to make their own e-twinning project in their individual school practice sessions.

In order to achieve better dialogues in their collaboration and evaluation work, it is also important to ensure that such groups of students in a cooperation relationship are at a similar academic level in their ICT skills, English-language competence and educational experience.

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