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Author(s): Kenttälä, Veera; Kankaanranta, Marja

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Courage to learn and utilize ICT in teaching - building understanding of teachers who lack courage

Veera Kenttälä
University of Jyväskylä
Finland
veera.kenttala@jyu.fi

Marja Kankaanranta
University of Jyväskylä
Finland
marja.kankaanranta@jyu.fi

Abstract: Innovative use of information and communication technology in education is a topic that has received a lot of attention both in public and academic debate. Innovative practices have been communicated and visions for sharing them have been around for years, however, the large scale adoption of such practices has not yet been achieved. While highlighting and sharing best practices may be an inherently positively motivated attempt, teachers enthusiastically explaining their innovative ICT practices may be met with even resentful attitudes from colleagues. Discussion focusing on praising innovative ICT teaching practices as good ideals may leave those teachers whose current teaching isn't up to this standard out of the debate. This paper aims to further the understanding of teachers who currently lack courage to try new ICT approaches in their teaching and how they could be supported in finding ICT practices that they are able to flexibly utilize in their teaching.

Introduction

Recent research efforts have been aimed towards understanding digitally innovative teachers and finding out how their enthusiasm and practices are being met and how these could be applied on a larger scale in schools. Thus, a lot of focus has been given to teachers who utilize innovative ICT practices in their teaching. During all the hype surrounding these so called early adopters of technology, the teachers currently using ICT in smaller scale in their teaching are often given negative attention and feedback in regards their ICT teaching practices. Also, the terms related to this group of teachers may have negative connotations such as *'Unbeliever colleagues'*, while innovative teachers are associated with more positive terms e.g. *'Lone believer'* (Stieler-Hunt & Jones, 2017). However, instead of focus on transferring innovative practices to other teachers, the question why all teachers are not adopting innovative practices has more seldom been asked.

According to Dweck (2012) the main difference between these two teacher groups can be observed in their mindsets. Those teachers with innovative practices commonly share a *'growth mindset'* and their focus is on finding ways to learn instead of focusing on how to teach (Dweck, 2012). The teachers with more traditional views may share *'closed mindset'* where errors and failure are not seen as opportunities to learn but as something to avoid. Mainstream pedagogy has not adopted error-welcoming pedagogies, which are utilized mainly by individual teachers (McWilliam, 2008). McWilliam (2008) elaborates that adopting this pedagogical view requires the ability to be at times uncomfortable and ignorant, which may be hard to teachers accustomed to strong control of teaching situations.

Inan and Lowther (2010) found out that teacher's beliefs strongly affected their use of ICT and the level of integration of ICT into classroom practice. In more traditional views, teaching can be seen as public exchange of knowledge to an audience of students, who learn from what their teachers offers them (Routarinne, 2007; McWilliam, 2008). The role of sole authority, instead of co-creator of knowledge, may cause stress related to chaos and losing control of what happens in the classroom (McWilliam, 2008). Sharing ICT teaching responsibility as is often suggested with more ICT savvy students, so called digital natives (e.g. Prensky, 2001; Helsper & Eynon, 2010), may not be a source of assurance but a challenge to the assumed status that is expected of teachers in traditional teacher centered views still affecting many ICT teaching practice (Kale & Goh, 2014).

Teachers with student-centered views on learning tend to lose control of learning and those with teacher centered views tend to assert strong control over learning and may even fear the loss of control. To cope with this

stress Routarinne (2007) explains teachers may start to limit their teaching practices and create routines of using teaching practices that have previously proved effective. As Kahneman (2012) explains when we as humans are faced where we feel threatened our actions may not be entirely conscious, due to unconscious priority being given to self-protective actions. Even slight fear and anxiety about failing may create demands and restrictions on thinking, which in turn limit the freedom, creativity, spontaneity and ability to create new (Routarinne, 2007).

At best on core level meaningful use of digital learning materials and games is focused on improving students learning processes and outcomes. Teachers are more likely to use ICT in a meaningful way, when it matches their pedagogy (Kale & Goh, 2014). Also there is indication that increasing general ICT use may have even negative effect on student academic achievement, if enough attention wasn't given to pedagogy and learning design related to ICT use (Vrasidas, 2015). Schools may also have set core organizational goals for use of ICT in education, however, individual teacher practices may not always be supportive of achieving these organizational level goals (Vermeulen, Krejins, van Buuren and van Acker, 2016; Hamari & Nousiainen, 2015; Leithwood and Jantzi, 2006). Tondeur, van Braak, Ertmer and Ottenbreit-Leftwich (2017) suggest that teacher beliefs about what is good education is a critical dimension in professional development programs for supporting meaningful use of technology for learning and teaching purposes.

Teacher attitudes towards using e.g. digital games in their teaching may still be influenced by views of games interfering with student's education instead of benefitting their education (Hodges & Prater, 2014). If digital games are seen as ineffective tools for learning teachers may not attempt or are not successfully able to find suitable links between games, curriculum and class context (Stieler-Hunt & Jones, 2017; Chee, Mehrotra & Ong, 2015; Hodges & Prater, 2014). However, as Stieler-Hunt and Jones (2017) point out the problem is more complex than simple alignment of games with curriculum, as their study indicated teachers were also among other things scare of losing control when using games in classroom.

Nardi and O'Day (1999) suggest that the basic problem in regards technology use is not in the overall use, but in making conscious choices in technology selection and ways of use. Why would teachers attempt to overcome their own insecurities and fears towards ICT use in their teaching, if they don't see value of it in relation to their students' learning? Vermeulen et al. (2016) found that intellectual stimulation of teachers in transformational leadership was the only variable to show positive effect on teacher perceived norms. Vermeulen et al. (2016) found that perceived norm had the weakest and attitude had a strong relation to intention to use ICT in teaching. Teachers attitude has also been suggested by other research (e.g. Kim, Kim, Lee, Spector & DeMeester, 2013) to be a key factor in teachers integration of ICT into their teaching.

Previous research has shown some indication (e.g. Badia, Meneses, Sigalés & Fàbregues, 2014) that teachers own use of ICT reflects on how they use ICT in student learning. Office software and word processing software in particular has been seen as a necessary prerequisite to basic ICT use in education. It has been suggested that teachers, who don't use simple office software such as word processing software (Hsu, 2011) only occasionally assign ICT-related activities to their students. Hsu (2011) suggests that teachers require certain level of proficiency with each particular tool to use the tool to enhance student learning.

This paper aims to shed light on those teachers who lack the necessary courage to try new (ICT related) approaches. The paper attempts to find out, what are the qualities and skills of those teachers who are not yet flexible and courageous experimenters in using ICT in their teaching. Thus the paper aims at building understanding of such teachers' current ICT-related teaching practices and skills as well as their needs for professional development. By doing this, we try to find more beneficial approaches towards closing the ICT related practice gap among teachers.

Research design

The data was collected through an online survey. Survey respondents included 151 in-service teachers from school levels ranging from preschool to upper secondary school in Central Finland (Kenttälä, Kankaanranta & Neittaanmäki, 2017). The main focus of this study was on primary and lower secondary school teachers, but some of the teachers participating in the study worked simultaneously in lower and upper secondary schools or in primary and preschool education.

The survey questionnaire was designed based on survey instruments in two earlier studies, namely Second Information Technology in Education Study (SITES; Kankaanranta & Puhakka, 2008; Law, Pelgrum & Plomp, 2008) and Finnish Teaching Technology in Education Study (Kankaanranta, Palonen, Kejonen & Ärje, 2011). Some additional survey items in regards teachers view on digital learning material and school were formulated based on the Speak Up Survey (Smith & Evans, 2010). The teacher survey consisted of 27 survey items that related to 4 main content themes: *'Current ICT habits and practices'*, *'Support for ICT use'*, *'Skills and ICT professional development'* and *'Curriculum and digital school'*. In combination of the background information this study takes a closer look at all relevant survey items from the four content themes to create understanding of the teachers who lack courage to try new approaches.

Subgroup of teachers for this study was selected based on their answers to a question dealing with their perceived ICT use barriers. More specifically, from this multiple choice question one statement *'I don't have the necessary courage to try new approaches alone'* was chosen for a closer study. When addressing the issue of ICT use barriers for teachers, one interesting observation is related to teachers' self-belief of their courage to use new ICT related approaches alone. Out of 151 teachers participating in the ICT survey 74 % assessed that they have courage to try new approaches alone. However, 26 % indicated that they didn't have enough courage. This paper focuses on these 26 % and aims to map out whether these teachers share other qualities and what are the issues related to the ICT related support they receive.

The main focus is on building understanding of the shared and individual characteristic of the teachers who indicate they lack courage in implementing new approaches. Some preliminary comparisons will be made with the group of teachers, who indicate they have courage to try new ICT approaches.

Results

The results section of this study is divided into four parts. Firstly, the background section addresses the subgroup of teachers lacking courage and elaborates on the basic age distribution, teaching experience and teaching disciplines within in this subgroup. Secondly, the use of ICT section takes a closer look at how this group of teachers themselves utilizes ICT and how their students use ICT in class. Thirdly, the issue of teachers perceived barriers to ICT use are further analyzed. Lastly, attention is given to the expressed support and professional development needs of teachers lacking courage to use ICT.

Teachers' background

Teachers lacking courage were predominantly female (79 %) and most commonly 50 - 59 years old (51 %). Other larger age groups were 30–39 (21 %) and 40–49 (21 %) years. Out of all the survey participants fitting in the age group 50-59 years 40 % belonged to the group who lacked courage. In other age groups the portion of teachers lacking courage was under 30 %. The teachers were mainly experienced teachers with more than 10 years of teaching experience (82 %). More than half (56 %) of teachers belonging to this group had more than 19 years of teaching experience. The group consisted of mainly primary school and subject teachers, who didn't teach ICT as a separate subject.

ICT proficiency and practices

There were several types of ICT tools and software that teachers used in their education at least occasionally (Figure 1). Half of the teachers lacking courage used messaging tools, practical equipment and mobile devices often in their teaching. Multimedia tools and interactive whiteboards were only categories where more than 49 % of teachers said they don't utilize it at all in their teaching. Other ICT related equipment and software were utilized at least occasionally by almost two thirds of the teachers lacking courage. On the whole teachers lacking courage and those having courage shared similar practices in what type of equipment and software they commonly use in teaching.

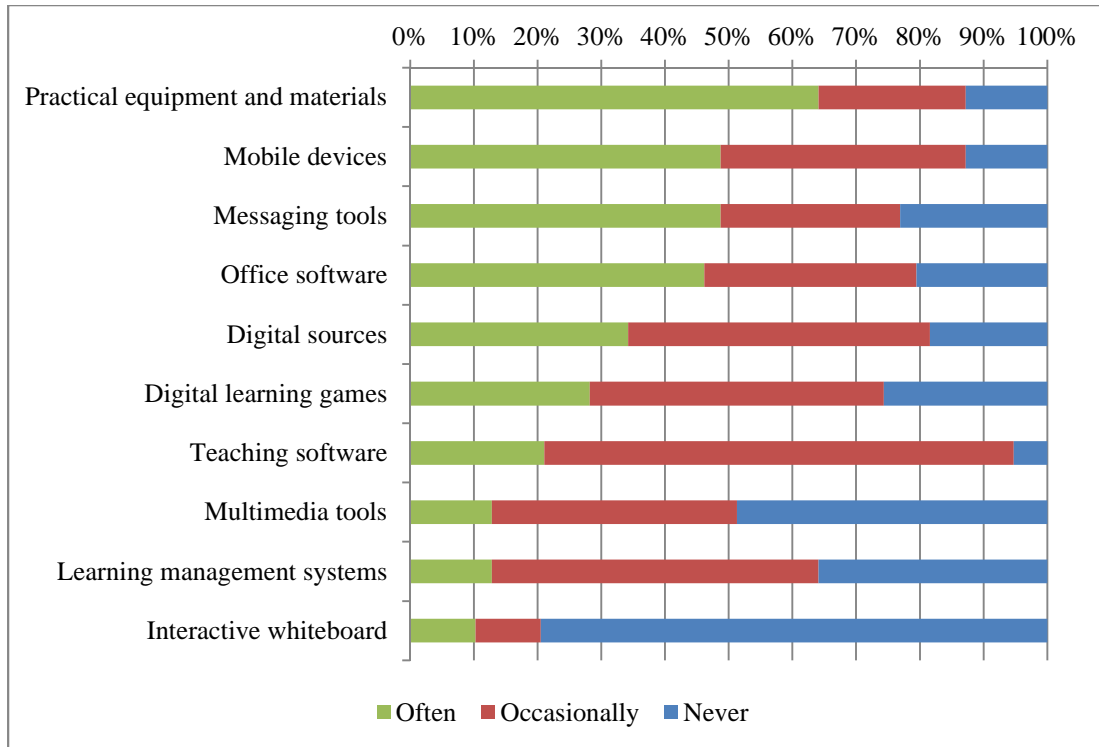


Figure 1: The ICT equipment and software most commonly utilized by teachers lacking courage

Teachers assessed their own proficiency in several ICT software categories and tasks (Figure 2). Teachers who lack courage claimed most proficiency in using social media and office software, as more than half of them indicated that they could use them at least reasonably well. Almost all of the teachers (95 %) lacking courage believed that they knew at least to some extent what kind of teaching and learning situations the use of ICT was suitable. However, generally speaking the group lacking courage did have a more timid view of their current knowledge about the situations where ICT use was suitable than their peers who have courage. None of the teachers lacking courage claimed excellent mastery in this aspect, while 35 % of the teachers with courage were confident of their capability to evaluate the appropriate situations where to apply ICT in teaching and learning.

Teaching coding and computational thinking is one of individual new core skill sets that were added to the Finnish national curriculum in 2016. As this survey was conducted before the new curriculum were adopted in schools it indicates the level of teaching proficiency prior to actual mandatory teaching of computational thinking in schools. Teaching coding and computational thinking on the whole is seen by teachers as something that most of the teachers lacking courage had no proficiency at all (82 %).

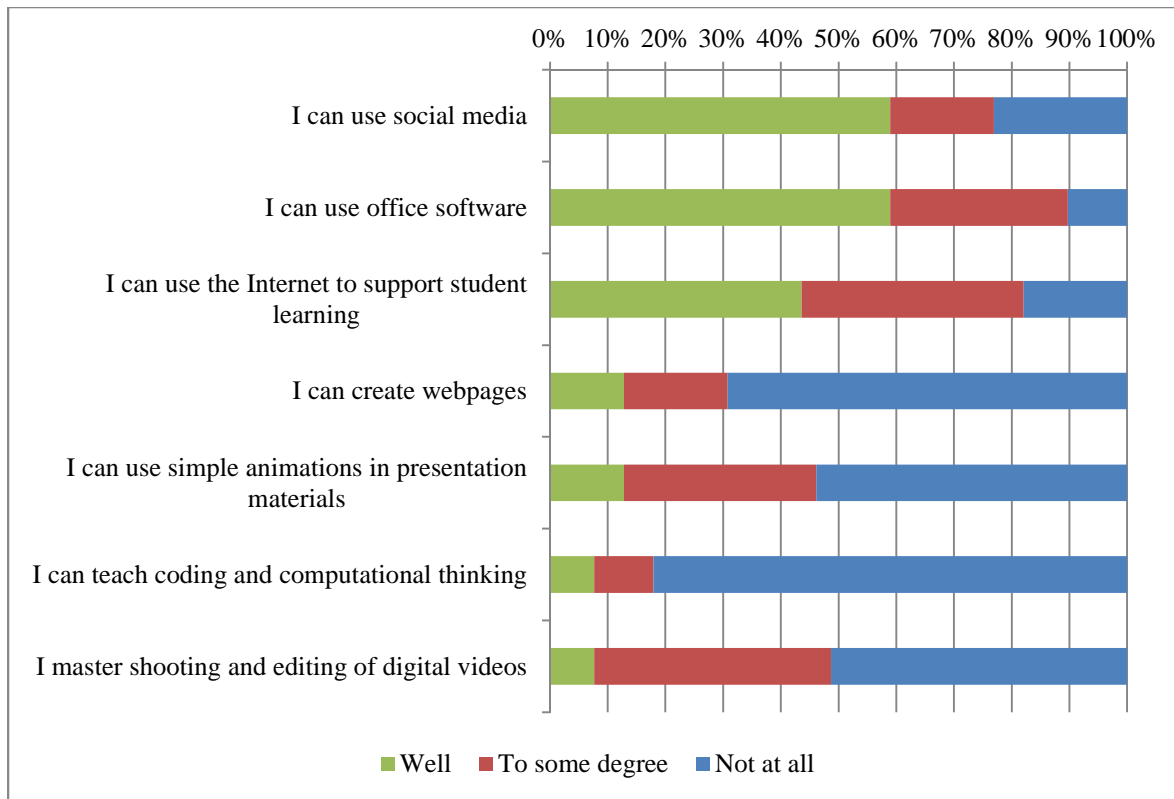


Figure 2: Teachers who lack courage perceived proficiency in ICT related tasks and use of ICT equipment

When analyzing how pupils use ICT during lessons clear indications in both teacher groups can be found towards a traditional strategies in pupils' ICT use. In both groups, it can be observed that use of ICT for students' to reflect on their learning, to complete self or peer evaluations or express their own ideas are tasks teachers seldom assign for their students. Also tests or other evaluations of pupils learning through the use of ICT aren't very common practice that teachers adopt with their pupils. ICT is most commonly used for independent self-paced learning, doing exercises, working with same materials with other pupils and giving presentations. These results show that there are some indications towards communicative learning strategies, but also indication that tasks related to deep learning skills such as reflection are not something that pupils often have the chance to do during lessons.

Although the general trend in student tasks show tendency towards traditional uses of ICT for learning purposes, some teachers lacking courage explained practically oriented but rather innovative ICT practices when asked about their most positive experience with ICT use with students. One teacher lacking courage named as their most positive experience using tablets for delayed video feedback and another using tablets in measuring friction. Using mobile devices such as tablets seemed to generally be the chosen equipment for more innovative ICT practices among teachers lacking courage.

Barriers of educational ICT use

Overall teachers lacking courage see several barriers in using ICT in their teaching (Figure 3). Most commonly they assessed that they lack time resources (87 %), ICT related pedagogical skills (79 %) and general ICT skills (77%). Among teachers who have courage the same barriers can be seen, but less than half (<45%) of the teachers in this group assess that these are barriers in their use of ICT. Furthermore determining what technological equipment in useful for their teaching was seen as a barrier by more than half of the teachers. Teachers also identified that they had a need for professional development courses, but that the required course was either generally not offered or their school didn't necessary resources to offer it.

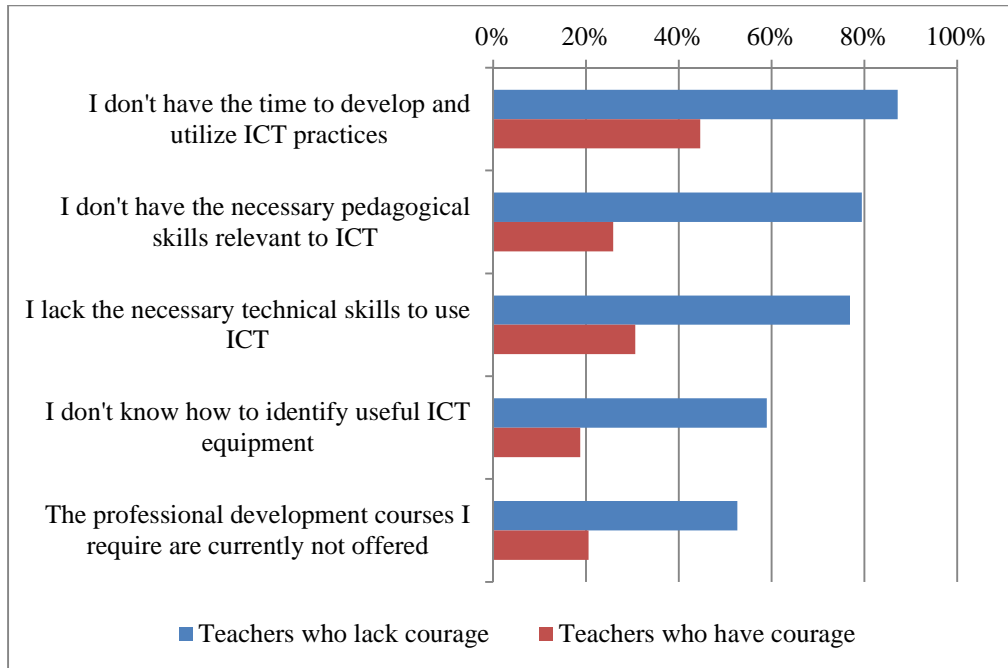


Figure 3: Teacher perceived barriers in using ICT for teaching and learning purposes

Professional development and support

According to the majority of teachers (83 %) the preferred way of organizing professional development were courses held at their own school. The level of participation on ICT professional development courses was relatively low in all course types (Figure 4). Introductory courses to basic and office software were the most common courses that teachers (23 %) had already participated in. When looking at the professional development needs of teachers it can be observed that majority of them expressed a desire to participate in several ICT related professional development courses, but are not currently able to do so. The type of professional development teachers expressed most interest towards related to pedagogically oriented course for integrating ICT in teaching and learning (79 %). On the other end of the spectrum courses related to technical maintenance and use computers was something over half (64 %) had not participated and had no interest in participating even, if the opportunity would be offered.

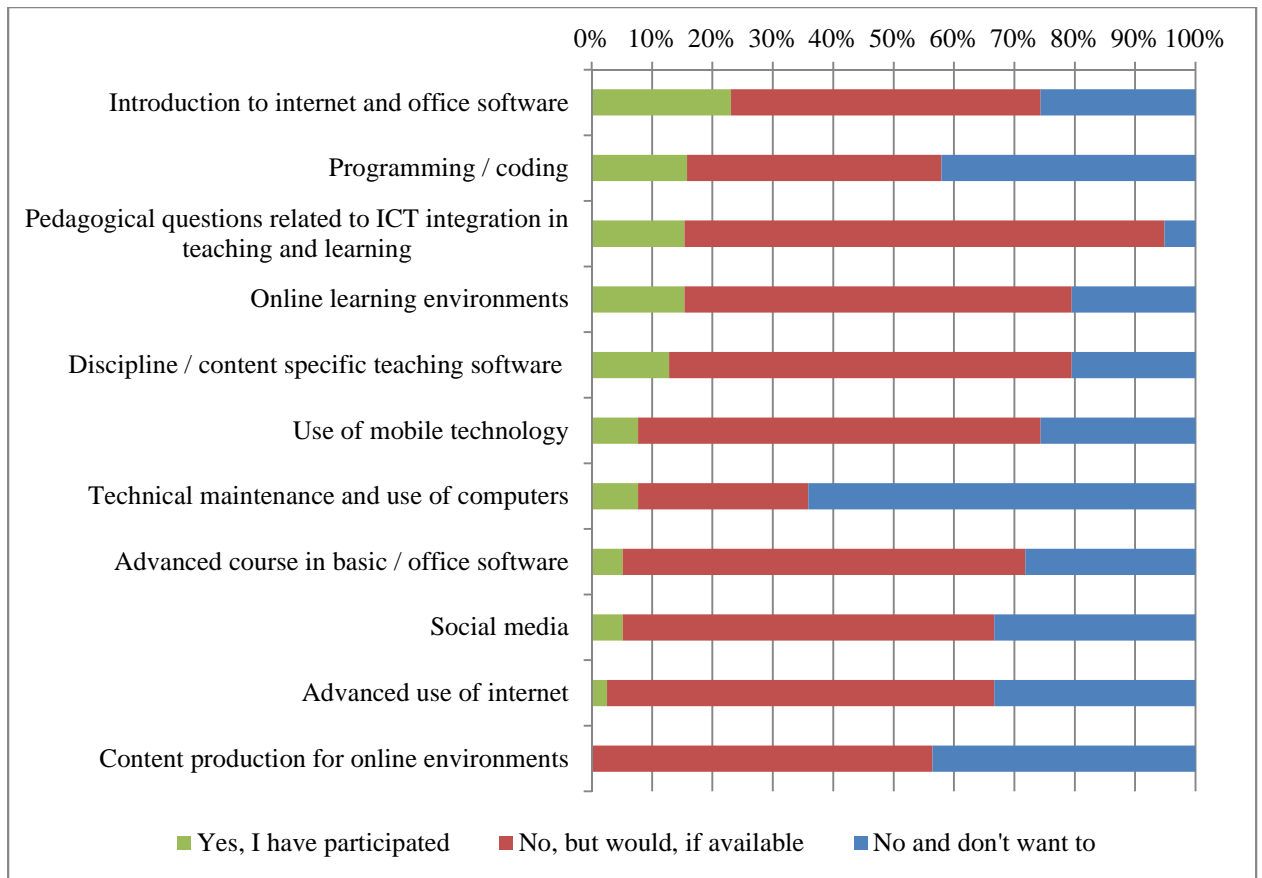


Figure 4: Professional development of teachers lacking courage

In addition to professional development needs teachers were asked to assess whether, if needed they receive enough technical support for their teaching (Figure 5). Almost two thirds of the teachers lacking courage also responded that they don't receive enough support when they need it. In the group of teachers that have courage more than two thirds of teachers assessed that they receive enough technical support for their teaching.

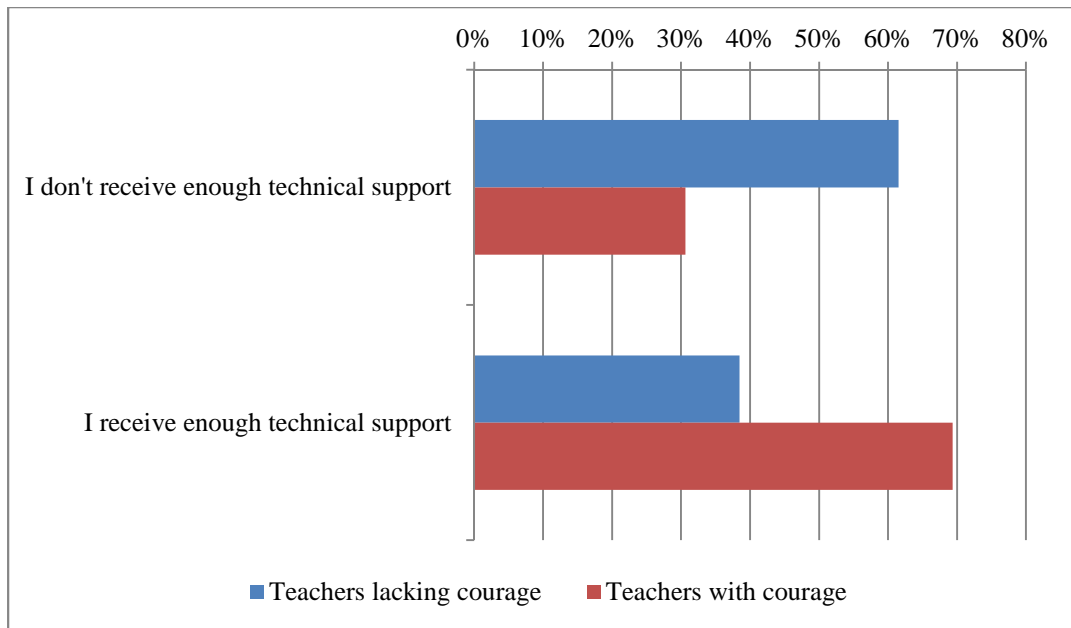


Figure 5: Current access to technical support during teaching

Discussion

As teachers are challenged to use digital technology in their everyday teaching practices, there is also a rise in more critical voices that question this need for constant change. As Nardi & O'Day (1999) suggest as long as sufficient knowledge about technology is a prerequisite for taking part in discussion about its use, a broader and joint dialogue is challenging to emerge. In order for the discussion around technology to free itself of the almost religion like rhetoric of 'lone believers' and 'unbelievers' in regards ICT a more neutral stance towards those whose current ICT use doesn't match the supposed ideal, might be necessary. Removing the stigma from using old pedagogy with ICT in teaching is a necessary first step towards giving voice to those that need it the most. As McWilliam (2008, p. 266) puts it "not knowing need to be put to work without shame or bluster".

"As long as we think we do not have enough expertise to engage in substantive discussions about technology, we are effectively prevented from having an impact on the directions it may take. [...] We believe that the lack of broad participation in conversations about technology seriously impoverishes the ways technologies are brought into our everyday lives." (Nardi & O'Day, 1999, 13)

While understanding and learning from best practices of current innovators in teaching is valuable, it may on the other hand place shame and stigma on those who are not yet achieving this set ideal in their teaching. Sharing of innovative ICT practices with great passion may even create a divide between teachers in the same school and start a cycle of resentment towards the teachers with innovative ICT practices (Stieler-Hunt & Jones, 2017). Stieler-Hunt and Jones (2017) suggest that even though hardware and software limitations may still be relevant barriers in teacher ICT use, addressing these barriers will only be effective when the underlying cultural and political issues are also addressed.

Teachers lacking courage to try new approaches have both individual and to some extent shared characteristics in regards of their current skills and views of ICT use in teaching and learning. Generally speaking teachers belonging to this group share somehow negative outlook on their ability to use ICT in more complex tasks. They perceive several barriers in their ICT use and their own proficiency in using ICT in teaching and learning. Also they feel that they don't always receive the technical support they require during classes, which in turn may inhibit their use of ICT in their teaching.

Previous research has suggested that teachers who don't use office software (e.g. word processing) also rarely assigned ICT related tasks to their students (Hsu, 2011). In this study 21 % of the teachers lacking courage said they never use office software in their teaching. However, most of these teachers despite not using office software in their teaching did assign several types of ICT related tasks for their students at least occasionally. Only one teacher not using office software did not assign any ICT related tasks for students.

Some positive indication was shown that the chosen ICT equipment may produce more innovative ICT practices also in teachers lacking courage. Traditional computers may in part lead to creation of more traditional learning tasks for students and mobile devices may through their affordances also spark the creation of more innovative student assignments. The physical availability of technological tool is not sufficient to ensure their use in education (Vrasidas, 2015). More attention should be given to the affordances of technology to assess what they bring to teaching and learning (Vrasidas, 2015).

Supporting and empowering teachers who currently lack courage to try new approaches is a demanding task. Although some characteristics are shared, this is a heterogeneous group of teachers with different backgrounds and needs in regards using ICT in their teaching. Deeper analysis of the needs and ICT related characteristics of the group of teachers lacking courage is required to understand the most suitable ways of supporting their individual support needs. The current work is a preliminary view on the group of teachers lacking courage but further research is required to find the shared and dissimilarities between teachers who lack and who have courage. Deeper analysis of their mindsets and pedagogical beliefs affecting their ICT practices are necessary to create better support and professional development practices that raise teacher's self-efficacy in using ICT.

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