Teachers' experiences of using ICT in teaching practical skills in adult education

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The aim of this research was to explore teachers' experiences in using ICT (information and communication technology) as a pedagogical tool in the subject areas of craft education and home economics education in Finnish AECs (Adult Education Centres). We focused on teachers' experiences of using ICT in teaching practical skills in these two subjects. Based on a sociocultural approach, teachers' experiences were examined from the perspective of embodied, material and social mediation. The data were gathered just before the COVID-19 pandemic via an open online survey. There were 34 respondents from several parts of the country. The data were analysed according to the three categories of mediation revealing the benefits and restrictions of using ICT. Some teachers had experienced that utilising ICT supported learning practical skills while the others did not find it very useful. All the teachers stressed the importance of using the senses (touch, taste, smell) in learning practical skills which the ICT did not allow. The results provide a starting point for reflecting on the situation that arose in March 2020 when the pandemic started.

Keywords: craft pedagogy, home economics pedagogy, adult education, ICT in teaching, learning of practical skills

Introduction

In the past few decades, the spread of information and communication technology (ICT) has been intensive, both in the society as a whole and in teaching. This also applies to the teaching and learning of practical skills in the context of craft and home economics education. Koehler and Mishra (2009) have argued that the teacher must consider students' needs and knowledge, the teaching environment, the available infrastructure and the environment in order to effectively teach with ICT. In addition, the special needs and actions that the particular subject area demands attention. Learning practical skills is a multi-layered process, and it is crucial to understand the interplay of the materials, tools and embodied actions comprising this process (Syrjäläinen & Haverinen, 2012). In hands-on activities, physical experiences and knowledge develop through the dialogue between the person, tool and material (Illum & Johansson, 2012). In this article, practical skills mean the hands-on activities that are needed in learning to prepare tangible artefacts or products in craft and home economics.

The Internet has provided a lot of support for learning about a range of skills in these subjects: there are numerous websites, tutorials, recipes and online groups where one can find information (Orton-Johnson, 2014). However, before the COVID-19 pandemic, little research was focused on using ICT in the teaching of both craft and home economics. Most previous studies on using ICT as a pedagogical tool in this context have focused on the use of digital devices or methods, such as virtual reality (VR) or artificial intelligence (AI) (e.g., Hallberg et al., 2020; Nortvig et al., 2020). Instead of focusing on certain digital tools, we explored teachers' general experiences of using ICT in teaching practical skills. The corona pandemic has resulted in expanded use of ICT as a way to provide remote education in crafts and home economics (Kouhia et al., 2021; Porko-Hudd & Hartvik, 2021). Since the data used in our study were collected just before the corona pandemic, our focus was on using ICT in teaching the practical skills in these two subjects in general and not especially in remote education.

The aim was to explore the teachers' experiences in the subject areas of craft education and home economics education in Finnish Adult Education Centres (AECs). We based our analysis on the sociocultural approach of learning and the central role of tool mediation, which is important while learning practical skills (Hedegaard, 2004; Kozulin, 2002; Vygotsky, 1978). By analysing the material, embodied and social mediation of teachers' experiences of using ICT tools in craft and home economics education, we wanted to take part in the development of new ways of using ICT in practical skills teaching and learning.

Although the research context of this study is adult liberal education in Finnish AECs, the results can be applied in other teaching and learning contexts as well, including vocational education and basic education.

The sociocultural approach in teaching and learning practical skills

Mediation in teaching and learning

The sociocultural approach, based on the classical writings of Vygotsky (1978), provides a theoretical understanding of the social nature of learning. According to this approach, cognitive development in the learning process is not a direct result of activity. Instead of acting directly in the social and physical world, our contact with the world is indirect and mediated by tools. The role of other people is important in social interaction with the learner, and the use of mediatory tools facilitates the learning process (Hall, 2007; Vygotsky, 1978). The mediators in this learning process are material and psychological tools and other human beings. The psychological tools are language, signs and symbols (Hedegaard, 2004; Kozulin, 2002; Vygotsky, 1978). Both material and psychological tools are social by nature (Kozulin, 2002). Vygotsky focused on child development and learning but recent research has revealed that the same learning processes apply to adults who are learning new skills (Rosser-Mims et al., 2017; Shah, 2017). Based on this, we found the Vygotskian definition of tool use and mediation helpful in the context of adult education.

Material and embodied mediation are an intrinsic part of both craft and home economics education. In this article, we regard mediation as a dialogue and embodied interaction between a person, tools and materials in a working process. The concept of mediation describes how the mind and body, tools and materials, functioning in the space and communicating with others work together in the processes of thinking. Hall (2007) noted that the interaction between participants sharing the learning situation determines the meaningfulness of the learning process.

Tool mediation in teaching and learning practical skills

Becoming an expert means that a person comes to understand an existing set of cultural tools; expertise is reflected in the ability to use these tools flexibly and fluently (Wertsch, 2007). When teaching and learning practical skills, it is necessary to learn how to use the tool before it can be used creatively. (Illum & Johansson, 2012; Keller & Keller, 1999). The learning of practical skills involves constant interaction, both social interaction between participants of the learning situation and physical interaction with materials, tools and body (Hallberg et al., 2020; Koskinen et al., 2015). Skills in crafts and home economics represent expertise combined with practical knowledge and thinking. As Yliverronen and Seitamaa-Hakkarainen (2016) stated, the maker has to know what to do, and how and why to do it.

The cultural surrounding forms the contextual frame for learning. Syrjäläinen and Haverinen (2012) stated that skill learning generates expertise, which grows from the skilled culture around. They add that the information about making, and elements of the skills culture are formed from several forms of tacit knowledge, such as sensory, emotional and self-regulation information. For Gulliksen (2017), such skills are developed through active making and prolonged engagement with the materials and tools. This

means interaction between both maker and material and between maker and sociocultural surroundings, with the help of diverse examples, scaffolding tools and materials.

According to Ekström (2012), the embodied nature of practical skills involves changes in the senses (auditory, visual and haptic), and the shaping of a material into an artefact in the hands of the maker is visual, aural and tactile by nature. Hedegaard (2004) observed that in sociocultural theory this happens in the internalisation process, through which the external interaction is transformed into a new form of internal interaction. The learning of practical skills requires an internalisation process with tools that promotes cognitive action, observational motor activity and both physiological and anatomical adaptations specific to the field of learning (Hall, 2007; Syrjäläinen & Haverinen, 2012). The students see the mediating tools first externally when the teacher shows them how to use the tool and after that internally, when they begin to use the tool independently. Hall (2017) stated that in the internalisation process, the tools modify the students' thinking processes, and finally the students begin to use these new tools to express their own thinking.

ICT as a pedagogical tool in teaching and learning practical skills

Hallberg et al. (2020) found that opportunities for direct interaction with the teacher should be afforded in ICT-mediated learning. There are several reasons for that. Syrjäläinen and Haverinen (2012) noted that teachers' ability to create supporting structures for learning according to the learner's situation is crucial for teaching practical skills. The embodied and material nature of practical skills means that verbal explanations are not enough in teaching skills, but the teachers must constantly demonstrate the skills to students in practice by embodied instructions. Learners' ability to follow teaching also depends on former experience. As Ekström (2012) noted, students' ability to follow the teacher's instructions are related to their former knowledge, embodied experiences with the tools and materials and the teacher's ability to guide and scaffold the learning processes.

Consequently, the teacher must determine the most suitable ways to use ICT as a pedagogical tool in both in-person and online learning while simultaneously considering the embodied nature of practical skills, students' skill level and their ability to use the related materials and tools. This also means that their bodily actions must be intermediated. Especially when planning remote teaching the teachers need to construct their teaching in a new way for an online environment, and the learners need to be in a place where it is possible to use all of the necessary tools and materials (Nortvig et al., 2020; Øgaard, 2018). How this is done varies according to the synchronicity and communication opportunities that exist in the learning environment and the time available to the teacher.

Visual aspects are often emphasised when using ICT in teaching practical skills, but the other senses are also crucial in learning, as the maker continually receives information through the various senses (Ekström 2012; Gegenfurtner et al., 2019; Nortvig et al., 2020). Riikonen and Seitamaa-Hakkarainen (2018) argued that ICT and especially the Internet only offer visual inspiration and do not allow inspiration from other senses, such as touch, taste or smell. Further, they stated that visual interpretation only works if the learner has contact with real materials and tools. The lack of embodied experience affects both the development and utilisation of tacit knowledge in learning. Without touching, smelling or tasting, it is difficult to understand how the material works in real life.

Just after the data for this study were collected, the COVID-19 pandemic in spring 2020 revealed many challenges affecting the teaching of practical skills online across the world. Teachers reported technological challenges and problems with accessibility (Kini-Singh, 2020) as well as challenges in adapting traditional techniques and pedagogical tools in an online form (Kouhia et al., 2021; Porko-Hudd & Hartvik, 2021). Søberg and Müller (2021) noted that communication forms changed because digital teaching requires more written, individual communication outside the teaching events compared to face-to-face teaching. The rapid transformation from classroom teaching to online teaching forced

teachers to concentrate on finding practical solutions to their ICT challenges, leaving less time for thinking about best practices from a pedagogical point of view. The complexity of human–tool interaction in online pedagogy impacts especially the teaching of practical subjects (Kini-Singh, 2020; Kouhia et al., 2021), such as craft and home economics.

Aims and methods

Aim and research question

The aim of this research was to explore teachers' experiences in using ICT as a pedagogical tool in the subject areas of craft education and home economics education in Finnish AECs. The methodological basis of the study lies in sociocultural theory. Teachers' experiences were examined from the perspective of embodied, material and social mediation. Central to all these aspects is the use of material and psychological tools in teaching and learning.

The research question is as follows: From the perspective of embodied, material and social mediation, how do teachers experience the use of ICT in teaching practical skills?

The research context

The research context of this study is liberal adult education in AECs. AECs are educational institutions that are available to everyone, regardless of age or educational background. In Finland, there are 181 AECs. The AECs we studied were located in several parts of Finland, both urban and rural. Learning is largely self-motivated and as a rule, not aimed at achieving a formal qualification. Classes are offered in a wide variety of subjects. The most popular courses are in crafts and home economics. The choice of courses on offer varies between centres, and each centre is responsible for designing its own curriculum to ensure that it best reflects the demand in their own local area. (Kansalaisopistot.fi; Keto & Takamaa, 2008).

In the Finnish educational system, craft and home economics are two separate subjects, and they can be studied at a range of levels, from basic to adult education. In basic education, the study of crafts includes the design, manufacture and assessment of the handicraft process of a product or work. The subject develops spatial perception, sensing, motor skills, creativity and oral design skills. The importance of crafts lies in its long-term and innovative working process and self-esteem-enhancing experience. Home economics education lays a foundation for pupils' everyday skills (i.e., food, environment, economy) and supports growth into responsible consumers with the ability to maintain the basic preconditions of everyday life and contribute as active members of the family and society (Finnish National Agency for Education, 2021). Although the objectives defined in basic education in the craft and home economic subjects also apply to adult education, liberal adult education emphasises the learning of different techniques and skills. In addition, social interaction and new experiences are important.

The craft courses of the AECs include a variety of techniques. In home economics, courses mainly concentrate on various cooking and baking skills. Students' motives to participate in the course vary widely. They can attend courses to get some benefits or skills needed in their work or as part of a qualification. They may want to pursue a new hobby, do something in their leisure time, or engage in social interaction with other participants who are interested in similar things. Alternatively, students may undertake courses simply because they want to learn new skills and gain a deeper understanding of things they are already interested in (Manninen, 2018). Often, students have several overlapping reasons for participating in the course. In these studies, the students use their own devices and materials, which needs to be considered when planning ICT use in the courses.

Data collection

The qualitative data were collected in spring 2019 before the COVID-19 pandemic. The data collection method was an electronic questionnaire with open-ended questions that was sent to 116 craft and home

economic teachers from 91 AECs. The questionnaire consisted of ten questions about the ICT devices and programmes the practical skills teachers use (1); why they use the particular ICT devices (2); what devices and programmes they would use, were it possible (3); if they don't use ICT devices, why not (4); how they use ICT in their teaching (5); in which learning situations do they use ICT in their teaching (6); the benefits of ICT use (7); the restrictions on ICT use (8); the perceived suitability of using ICT to teach embodied skills (9); and how the use of ICT affects social interaction in learning groups (10). Open-ended questions allowed deeper understanding of the teachers' thoughts.

Here, ICT as a tool refers to all the devices, programmes and platforms that are used pedagogically to promote the teaching and learning of practical skills. Since ICT is a broad concept, in the questionnaire we classified ICT tools into three groups to help the teachers who responded to the questionnaire understand what was meant by ICT in this study: (i) digital devices and programmes, including the sharing of materials in digital form and electronic platforms, when they are used in teaching/learning; (ii) digital learning environments and platforms, specifically designed for teaching, where teaching takes place in full or in part interactively online; and (iii) social media platforms, on which groups can be formed for discussion and sharing experiences.

There were 34 respondents from several parts of the country. The answers were numbered from N1 to N34 to ensure the respondents' anonymity. Most of the answers were from craft teachers (30 respondents), while four respondents taught only home economics. In addition, two of the craft teachers taught both crafts and home economics. All the teachers had from five to more than 15 years of work experience.

Data analysis

Theory-driven qualitative content analysis was employed (Schreier, 2012). The data were first read several times to get an understanding of the teachers' responses. In the coding process, the data were first divided into three thematic categories of embodied, material or social mediation according to the teachers' responses. In this study, the category of embodied mediation refers to all senses and physical actions used by the maker in working to prepare an artefact or practical work in home economics (e.g., baking or cooking), but also to the bodily instructions that teachers use in teaching. The category of material mediation in practical skills refers to the use of different materials in planning and making, which provide information on the behaviour and suitability of the material for the designed artefact or handmade product. It also refers to the use of the tools that are needed to work on the materials and the information that the maker obtains through them. The tools can be needles, scissors or equipment for working with fabrics and yarns or various kitchen tools related to food supplies. The category of social mediation refers to interaction between students and teachers as well as between students.

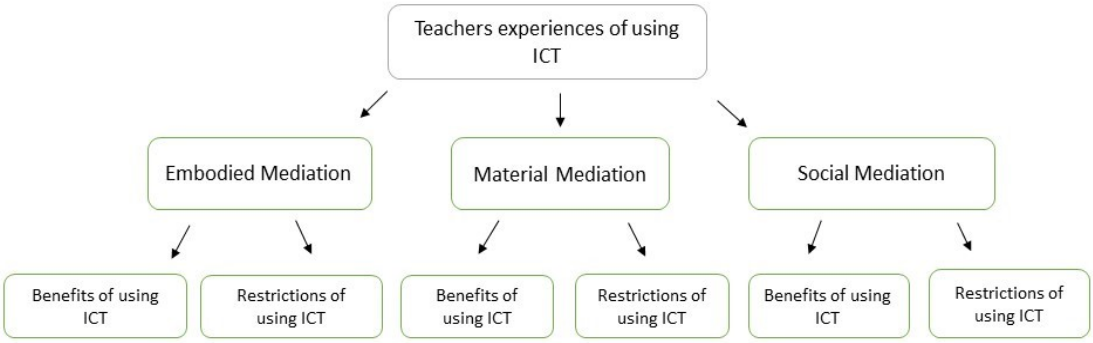

Figure 1. Data analysis groups

The analysis of the data was two-folded. After identifying the three categories of mediation (Figure 1) all answers were read again to identify sub-categories according to teachers' negative or positive responses about ICT use. These sub-categories were coded with different colours as negative and positive comments.

The negative comments were interpreted as referring to the restrictions to using ICT, and the positive comments were interpreted as referring to the benefits of using ICT in teaching and learning practical skills. The sub-categories, the benefits and the restrictions were placed into three categories of mediation.

Results

The overall impression from the data was that the use of digital devices at different AECs varies a lot. However, the teachers had some common thoughts. Most of the teachers felt that there was insufficient time. Problems with the use of devices and learning can distract attention from the topic being taught and reduce working hours. Teachers should have time to learn how to use new digital devices or programmes, which are not usually considered when establishing what their working hours should be, and the maintenance of social media related to a particular course, was sometimes seen as too time-consuming. Often the planning and implementation of online courses or electronic teaching material takes a lot of time, and they were perceived to be too burdensome. The lack of digital competence and high expectations were also identified as causing confusion, discouragement and frustration.

Nevertheless, the teachers used various digital tools and platforms as a part of their teaching. The most popular digital platforms were YouTube because of its tutorial videos along with Pinterest and Instagram, especially in terms of teachers' teaching/course planning and as a material bank for students' ideas and artifact design. Although Instagram is normally considered to be a social media platform, as a pedagogical tool it was used mostly as a source of ideas and artefact design. Regarding social channels, Facebook was used for dividing ideas and communication, while WhatsApp was mainly used for communications within the group. The special learning environments were not regular, but some teachers used sites like Moodle or other more local teaching and learning platforms. Digital tools for visualising were highlighted, and most of the respondents considered videos a good type of media for learning and going back to the source of information. In some courses, work processes were videotaped and distributed either among participants or, more broadly on the Internet. This way, video was used as a social mediation tool; completed work was distributed and commented on.

Embodied, material and social mediation are intertwined in the learning process but since they play different roles on the whole, we wanted to examine them separately to understand their roles better. The results are discussed according to teachers' experiences regarding the benefits of and restrictions of ICT use in embodied, material and social mediation in practical skill teaching and learning.

Embodied mediation and ICT use

Table I. Embodied mediation: Benefits and restrictions of using ICT

Benefits	**Restrictions**
Beneficial tool for supporting verbal instructions	Restrictive tool for using different senses in learning
Beneficial tool for repeating instructions	Restrictive tool for hand-to-hand guidance
Beneficial tool for self-reflection	Restrictive tool for the teacher's tacit knowledge

The teachers were concerned about the students' learning of embodied actions required for a particular technique. However, their experiences in teaching embodied actions and using different senses by employing ICT in teaching varied considerably. Teachers who had experiences that were mainly positive emphasised the benefits of using ICT, whereas those who had mainly negative experiences reported more restrictions in using ICT in learning practical skills.

Teachers with positive experiences felt there were many benefits of using ICT (Table I). They emphasised the importance of visual methods and the strong impact of images to support the teaching and learning of practical skills. Images could be a strong mediator and help the person to feel with their other senses. *The image may be a strong sensory tuner, even those senses that are not necessarily 'in use'*. (N34). In addition, explaining the bodily movements shown in the videos using words could also promote learning. *The teaching videos should contain a verbal reference to the actual sensations that prevail during the making process.* (N22)

The teachers who often used videos in their teaching experienced their versatile use as an integral part of their teaching. Both online tutorials and self-made videos were used to help the students learn, as they were considered to be a good way to support learning because they demonstrated the embodied actions that were needed to learn a particular technique. Video tutorials were sometimes considered to be pedagogically even better than verbal explanation. *The videos are easy to show, for example, the sewing of the shirt collar, the basic crochet stitch, or the new ideas of the spring fashion show.* (N6)

Another reported benefit of videos was their reproducibility, which supported learning. The student can repeat the instructions as many times as necessary for learning. *You can watch the video, in a course or later at home, even a hundred times. (N34)*

Teachers reported that also their students sometimes made videos about their work-in-progress. *Students make videos in collaboration, in which they interview others and describe the progress of the craft process.* (N32) The teachers had noticed that when reflecting on their learning, students who make videos are better able to perceive the different stages of learning the skill.

The teachers with negative experiences of ICT felt there were many restrictions in using it in their teaching (Table I). They believed that ICT played only a supportive role in teaching, if any. They emphasised that different senses and hands-on work were central to practical skills teaching. *The senses are essential in teaching, to coordinate the movements of the eyes and hands, the images alone are not enough.* (N17) The ability to touch, smell and taste was seen as crucial in learning, and achieving this on digital platforms was considered to be difficult. These teachers felt that visual perception alone was not sufficient for learning practical skills. *When using ICT, the images of the fabric cannot be touched, nor can you hear the sound of the shaking material, nor can you smell sheep wool when working with it.* (N11)

Teachers also indicated that demonstrations in live situations were essential for learning and the videos were not enough to support teaching. *Things to be taught often require 'hand-to-hand' guidance that is not replaced e.g., by videos, and actual teaching does take place face to face*. (N11) These teachers saw that teaching and learning were only possible in face-to-face situations. The respondents considered ICT to be a beneficial tool for supporting verbal instructions, repeating instructions and for students' self-reflection. However, there were also some restrictions. According to the teachers' responses, learning to use different senses in hands-on activities and difficulties to mediate teacher's tacit knowledge were considered to be easier in face-to-face teaching.

Material mediation and ICT use

Table II. Material mediation: Benefits and restrictions of using ICT

Benefits	Restrictions
Beneficial tool for designing Beneficial tool for searching for ideas and instructions Beneficial tool for learning to work with tools and materials	Restrictive tool for teaching and acquiring material knowledge Restrictive tool for teaching and learning concrete working tools knowledge

In the category of material mediation, the teachers used ICT for both ideating and designing artefacts as well as for learning to use the tools needed for making a particular artefact. However, the teachers' responses emphasised the use of ICT as a tool for planning and seeking ideas.

According to teachers with positive experiences, ICT often worked well in the early stages of artefact design and in the search for ideas (Table II). A lot of visual material found on social media platforms was used in the design, which was seen as an opportunity to search for ideas. *In Pinterest can be found endlessly ideas and everything new. (N2)* Some of the teachers also used various programmes intended specially for design. *Design programmes are good, e.g,. DesignaKnit and Weavepoint. (N19)*

When studying the use of materials and tools, the importance of videos was emphasised in the same way as when studying physical movements. *A short video or a series of pictures of ready-made meals may be a crucial factor facilitating practical work, when the student already has the idea of what and how to do it*. (N34) In this context, embodied movements and material tools were strongly interlinked.

Teachers with negative experiences felt that tools other than digital tools should be used in designing (Table III). *I will focus on designing in my own teaching (tools to a large extent paper, photographs designing, drawings).* (N10) They also indicated that the information the maker can obtain when working with materials and tools was difficult to mediate through ICT. *In material studies, there is nothing to replace the actual exploration of the material itself as yarn/fibre/fabric.* (N4)

ICT was seen as a supportive tool for learning, but it was not considered to be sufficient to convey all the information needed in the work. *Digital tools do not replace on-site craft material; online-assisted courses also have important live experiences*. (N1) Although these teachers stressed hands-on activity and face-to-face situations, they supported the idea of using ICT alongside other methods for creating ideas and designing. *The ICT tools are mostly for the search and transmission of ideas, but the actual work is planned and made manually*. (N33)

ICT was reported to be a good planning and designing tool. However, not all teachers agreed whether ICT was a good tool for teaching and learning how to use concrete tools and materials. Anyway, it was not seen as a good way of replacing all the face-to-face situations in teaching and learning.

Social mediation and ICT use

Table III. Social mediation: Benefits and restrictions of using ICT

Benefits	Restrictions
Beneficial tool for communication and connection Beneficial tool for promoting social interaction	Restrictive tool when all the participants don't have equal technical skills or opportunities Restrictive tool for face-to-face interaction

Social mediation is an important part of all practical skill studies. However, as Manninen (2018) noted, it is even more important for the participants in practical skills courses offered by AECs. The participants of those courses want to meet others who are interested in the same things in their leisure time.

In our data, the teachers who found benefits in using ICT in social mediation considered it to be a good way of promoting social interaction in the group (Table III). *Joint WhatsApp and Facebook groups are very good for creating collective spirit.* (N25) They also used ICT to socialise the participants in online group work. *If the group is present, for example via Skype, and can even hear each other's voices, it is possible to create a sense of community*. (N22)

The teachers had recognized that some of the groups formed during the course enjoyed such good cooperation that the members continued to contact each other after the actual course ended. *Teaching groups' own, e.g., Facebook groups, continue their lives long after the courses.* (N21) Some teachers thought that ICT could help to expand social interaction. *Digital platforms on which learning, the exchange of thoughts and ideas will continue after the course, specifically broaden social interaction.* (N34)

Although social interaction using social media tools was recognised as being different from face-to-face interaction, it was not considered better or worse: *I do not think that interactions on digital platforms are better or worse than face-to-face interactions - only different*. (N34)

The teachers also reflected on the restrictions of using ICT as a tool in social interaction (Table III). Some teachers felt that social mediation could not be achieved at all through ICT. Face-to-face interaction in the classroom was considered to be crucial.-The use of ICT as a tool for social interaction was sometimes considered to be complicated because not all course participants had the same opportunities or knowledge to use the various tools and platforms. As a result, some of the learners did not acquire all the information and were left out of the discussions. Some older people frequently participate in practical skills courses offered by AECs, but they often do not have digital devices nor a desire to use them. This was also seen as a restriction in terms of using ICT in social interaction. *Social interaction is important in my courses because there are many older people in my groups and the interaction cannot be linked to digital education. (N11)*

ICT has many advantages in promoting social interaction before, during and after the course with the learning group. However, it may give rise to a feeling of externality, if not all of the participants have the skills or the opportunity to use ICT tools.

The teachers participating in this research saw both benefits and restrictions in using ICT. Some of them thought that undertaking hands-on activities and communicating in face-to-face situations is more effective and makes it possible to use all of the senses in learning. Those teachers emphasised that learning to use materials and tools in the process of making a particular artefact is not possible when using ICT. However, teachers with positive experiences of utilising ICT saw it a good way of acquiring practical skills. Videos were widely adopted in teaching practical skills. However, visual interpretations were regarded as both a benefit and a restriction. Videos were considered to be a good way of learning the bodily movements and how to use tools and materials. However, the importance of the senses in learning practical skills was emphasised; the learner cannot experience touch, taste or smell from a video.

Discussion

The aim of this article was to explore the Finnish AEC teachers' experiences in using ICT as a pedagogical tool teaching practical skills in the subject areas of craft and home economics education. Based on the sociocultural approach to learning, we examined the teachers' experiences from the perspectives of embodied, material and social mediation. By looking at the teachers' positive and negative experiences, we discussed the benefits and restrictions of using ICT in their teaching.

The data used in this study were collected before the COVID-19 pandemic started in March 2020. Most of the practical skills courses in this study took place in face-to-face or blended learning settings. Additionally, in some of the courses, students were encouraged to use ICT at home as well. Only two respondents out of 34 had tried online courses, and two other respondents mentioned it as a possibility. They were given the students living a long distance away the opportunity to participate in the course online. This situation provided an interesting point of view on practical skills teaching.

Although our study did not concentrate on remote education in particular and the data were collected before the COVID-19 pandemic, the results reveal similarities with the recent studies on remote education necessitated by the pandemic. In our study, teachers felt that they had insufficient time to learn how to use ICT in the best possible way in their teaching. Also, in the studies concerning remote teaching during COVID-19 pandemic noted that teaching practical skills online requires more work, greater preparation and adapting the teaching of hands-on activities to digital platforms (Kini-Singh, 2020; Søberg & Müller, 2021; Kouhia et al., 2021). The respondents in our study commented that using social media in a learning group is difficult if not all the participants have either technical skills or opportunities to use ICT. Porko-Hudd and Hartvik (2021) found that communication in the courses depends on the participants' skills and opportunities to use digital devices and platforms.

Embodied actions are central to the learning process (Syrjäläinen & Haverinen, 2012). In practical skills teaching, it is important to mediate bodily actions, different senses and use of materials and tools in social interaction. In our study the teachers considered one of the main restrictions in ICT use the fact that it can be more difficult to learn embodied actions by ICT only. During the learning of practical skills, it is essential that the learners can touch and manipulate the material and learn how to use tools in a place where the teacher is present and ready to guide the learner (Nortvig & al, 2020; Hallberg & al, 2020).

Our study also revealed some of the reasons for the problems that the teachers encountered at the beginning of the pandemic. Although ICT had a strong role in various functions in Finnish society before the COVID-19 pandemic, most practical skills teachers had used ICT only to support face-to-face learning. At that time, most of the teachers were not using online courses at all. The situation was similar in many other countries, such as Estonia (Taar & Koppel, 2021). Notably, before the pandemic, most AECs were not investing much in special digital learning environments or platforms for teaching, and therefore the teachers mainly used free applications and platforms.

Inadequate skills in using the devices can distract attention from the topic being taught and reduce the time available for practical activities. Specifically, when the COVID-pandemic began, the teachers needed time to learn new methods and use of digital devices. The planning and implementation of online courses and electronic teaching materials and the maintenance of their own social media were seen as being too time-consuming (Kouhia et al., 2021; Porko-Hudd and Hartvik, 2021). The lack of digital competence and high expectations may cause confusion, discouragement and frustration, which was revealed also in our research.

Our analysis revealed that the reluctance of some teachers to utilise ICT was based both on how they viewed the nature of teaching and learning practical skills, and on what resources and skills they had.

The resources were especially related to premises and tools. Many AECs are located in suburban or rural areas, where the facilities might not always meet the requirements of efficient teaching. In addition, many AECs cannot provide the student with the necessary devices, so each student must use their own device if they have one. However, not everyone has a smartphone or a computer, and there are many operating systems and platforms. This was also reflected in the teachers' responses on how they saw the possibilities for social interaction through ICT. Some teachers stressed that social interaction through ICT is not possible because not all students are able to use the same media.

In conclusion, in 2019 when the data were collected, there was a common understanding that it would be difficult to transfer entire courses to an online setting due to the nature of practical skills and the importance of face-to-face communication in teaching and learning about them. Because of the strong role of embodied and material mediation in teaching practical skills, it was believed that online teaching would be pedagogically too challenging for teachers. However, the COVID-19 pandemic forced all education to adapt to the requirements of remote pedagogy. Kouhia & al. (2021) noted that although teachers met a very challenging situation in the beginning of the COVID-19 pandemic, they could nonetheless develop useful pedagogical practices for their teaching during the pandemic. It has thus become crucial to understand what devices and platforms are suitable for teaching practical skills and how and in which situations ICT can support the pedagogy of practical skills teaching the most efficiently.

The main limitations of this study for broader conclusions were the small number of respondents and the research method used. To get a deeper understanding of the teachers' thoughts, a mixed research method including interviews could be used. Also, the fact that the data were gathered before the pandemic imposes limitations. However, this study shows the situation when the teachers faced the starting point of a pandemic. Further investigation is needed to understand fully how this rapid technology integration has affected practical skills teaching, what innovations and pedagogical solutions the teachers have used and what their experiences have been in using remote teaching in craft and home economics courses. The teachers in our study expressed their need for learning more on how to utilise ICT in their pedagogy. They also needed support from the AECs and their colleagues to improve their confidence and to develop the best practices in ICT supported teaching. The pandemic has highlighted the importance of support for teachers to utilise ICT in a pedagogically reasonable way in their teaching, both remote and face-to-face.

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