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The questions elaborated upon and discussed in this article emanate from all educational levels at which education and studies in crafts appear in Finland. The following questions permeate the article: What is the status of Finland´s educational craft field at the end of the 2010s? What are the challenges and opportunities for crafts on different educational levels? What seem to be the trends for the future of Finnish craft education? Education in crafts at all educational levels in Finland is directly or indirectly affected by the steering documents for general basic education, which have consisted of the National Core Curriculum (NCCBE) since 2014 (Finnish National Agency for Education, 2016) and the lesson-hour distribution since 2012 (Government Decree, 2012). For the first time, the craft subject in the NCCBE has been clearly defined as one subject for all pupils with no division into textile crafts or technical crafts. This has influenced how teaching is organised and implemented. More generally, there is also an ever-increasing need for basic education to take into account the demands for lifelong learning, innovation, and the knowledge and skills to solve the problems of the future. Questions concerning the cooperation between teachers and the nature of holistic craft-based projects with content from the wide range of content in the subject must be dealt with and resolved. The effects of the curriculum on teacher education consist of the dilemma of restructuring the education and carrying out further education of subject teachers within common crafts. At the same time, universities in Finland are undergoing constant restructuring due to the strained economic situation in public finance. The Ministry of Education and Culture (MEC) steers the development of universities by allocating project funding for the cooperation between educational institutions and stakeholders in society. This has led to new ideas regarding cooperation between the four Finnish universities that provide studies in the science of sloyd education, craft, design, and technology education, and crafts science.

Keywords: crafts, sloyd, basic education, teacher education, holistic-based crafts

Preface

The presentation of crafts education and research in Finland reported in Techne series B15 in 2008 (Johansson & Lindfors, 2008) focused on the historical background of crafts in basic education and the national core curriculum from 2004. Craft education in general upper secondary school was also presented. Regarding research, the focus of the article was set on describing the scientific disciplines crafts science (finn käsityötiede; swe slöjdvetenskap) and craft, design, and technology education (finn käsityökasvatus) as well as the science of sloyd education (swe slöjdpedagogik). Research areas at each of the four universities in Finland that are by Government Decree 398/2017 (2017) obliged to arrange subject-teacher education in crafts, consisting of University of Eastern Finland (UEF), University of Helsinki (UH), University of Turku (UTU), and Åbo Akademi University (ÅAU), were also presented.

The future in 2008, as presented in the article, built on the work done by previous professors regarding Nordic cooperation in craft research. While the possibilities for PhD studies within the topic were at the time scarce in other Nordic countries, Åbo Akademi University began at this time to offer PhD studies in craft (sloyd) education for doctoral students from all Nordic countries.

The article ends with the identification of areas common for all Nordic countries to develop within craft education. These areas consisted of challenges regarding digitalisation, sustainable development, holistic craft processes, entrepreneur education, and the concept of multi-material crafts transforming physical material into artefacts.

Current situation

Today, in Finland, craft teacher education is by Government Decree (2017) offered in the four universities that were mentioned earlier, and all craft teacher students graduate with a Master's degree, with the possibility of completing their postgraduate studies to doctoral dissertation. So far, these universities have had their own histories and profiles as well as their own development projects that have their impacts on the concepts used in the major degree. These consist of crafts from former Finnish textile-based craft teacher education, sloyd from Swedish craft teacher education in textile and technical crafts, and craft, design, and technology from former technical work-based craft teacher education.

The Ministry of Education and Culture (MEC) standardised the title of the main subject in craft teacher education as craft science (finn käsityötiede; swe slöjdvetenskap) in all craft teacher education institutions at the end of 2013 (OKM, 2013). This helped craft science to be seen as an umbrella that could compile research concerning, for example, design, craft-making processes, and the use of products (Pöllänen & Urdziņa-Deruma, 2017).

Earlier, there had been some cooperation between the four universities; however, only since the new MEC-financed Innokomp project that began at the beginning of 2017 have all the universities started working together connecting student studies in craft teacher education to craft teachers' continuing education (Innokomp, 2018). The main aim of the project is to renew teachers' pedagogical practices with the activities that exploit co-development, digital modelling, and multi-materiality. In the same vein, the main task in craft teacher education is to provide students with the qualifications for performing teaching and consulting tasks in the domain of multi-material crafts in various educational settings and sectors of society. (University of Turku, 2017.)

In this article, the current challenges and opportunities within the Finnish craft field are presented from the perspectives of craft education on different educational levels, starting from early childhood education, to basic education, to general upper secondary school, and finally, to teacher education. Postgraduate studies to doctoral dissertation are discussed in relation to research within the field. Emphasis in the article is set on crafts in basic education. The presentation is made in relation to research within the area and recent or ongoing projects at the four universities.

Crafts in early childhood education

Crafts and design are part of early childhood education in Finland. Child-centred learning approaches, learning through play and a passion for learning, are the general objectives of the main areas of education in pre-primary education: expression, language, community, environment, growth, and development. Craft and design are part of the topic of expression, and are aimed to provide children with holistic experiences of craft processes. Technology education is also more explicitly connected to pre-primary education in the new curriculum. (Finnish National Agency of Education, 2016.) Craft, design, and technology learning are meant to be implemented with child-specific ways of acting, i.e. playing, moving, artistic expression, and exploring. Designing and making are seen as multi-modal processes requiring problem-solving processes, mind and eye coordination. The research in the area focuses on understanding children's embodied and multi-modal way of learning and interacting during craft processes (see Yliverronen & Seitamaa-Hakkarainen, 2016). The focus of developing craft, design, and technology learning is to find ways of encouraging children to use their own ideas and various manifestations as a basis of their design and making, instead of traditional models and patterns given by teachers. A child's experiences and expressions can be realised by listening to their personal choices and feelings (Rönkkö & Aerila, 2015). Yliverronen (2014) has noted that self-designed products that are a result of a child's own ideas and designs can still include training of basic techniques and correct working methods as well as practicing fine motor skills and concentration. There are clear indications of how crafts in early childhood education can be implemented in different learning environments, and how storytelling can support younger learners' holistic-based craft processes (Aerila & Rönkkö, 2015; Aerila, Rönkkö, & Grönman, 2016).

Crafts in early childhood education and especially in early childhood teacher education are areas for further research and development in Finland. The new development and research project InnoPlay 2018–2021, financed by the Ministry of Education and Culture, is aimed to promote learning based on the areas and subjects of interest of the child and combines varied subjects to craft, design, and technology learning. It brings together educators and teacher education students through The Craft, Design, and Technology (CDT) programme, The Early Childhood Education and Care programme, and The Science (STEM) programme as well as the municipality personnel of early childhood education, pre-schooling, and public officials in local councils.

Crafts in basic education

Crafts has been a compulsory subject separate from art in Finnish schools since 1866 (Figure 1). In the beginning, the subject was divided by gender into handicrafts for boys and handicrafts for girls. In practice, the implementation of craft education mostly involved the development of skills needed to maintain agricultural and household equipment and tools (Simpanen, 2003; Suojanen, 2000). During the early years, it was also important to produce and repair the artefacts needed in daily life (Komiteamietintö, 1952). In the curriculum for basic education in 1970, after the old parallel school system was transferred to the comprehensive school system, the names of the subject were changed to crafts, textile crafts, and technical crafts to diminish the gender-related aspects of the subjects (Pops, 1970). They were separate subjects; however, all students had to study both of them from grades one to three. After this, the students could choose one of them for grades 4 to 7. However, during the sixth grade, students had an exchange period for the other, non-selected, craft. Therefore, the students in textile crafts learned technical crafts and vice versa (Pops, 1970). Gradually, the proportion of common crafts increased, raising the discussion about the educational value of design, art, and expression (textiles) as well as technology education (technical work).

Since the curriculum reform in 2004 (Finnish National Agency of Education, 2004), crafts has been a single combined compulsory subject for all students. The curriculum emphasises the holistic craft process and common crafts, which include both technical work (e.g. wood, metal, plastic, and electronic work) and textile work (e.g. sewing, knitting, crocheting, weaving, embroidery, textile printing, and felting).

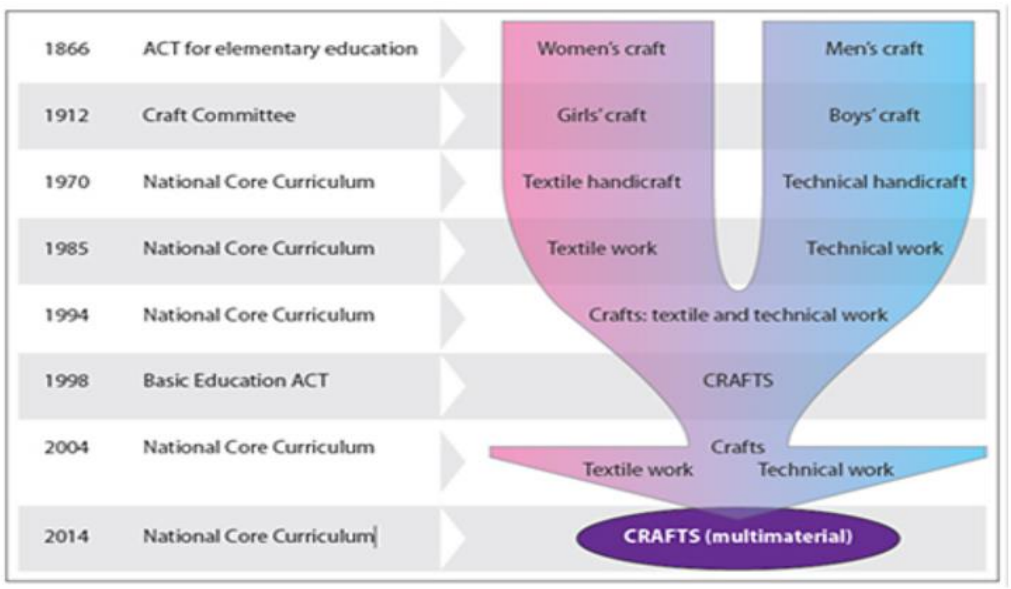

Figure 1. The historical development of gender-based crafts to an equality-oriented multi-material school subject (Lepistö & Lindfors, 2015).

A holistic craft process refers to crafts in which a single person acts or participates as an active member of a group at all phases of the process. This maker is involved in the ideation, design, manufacturing, and evaluation of the output and the process. The holistic craft process includes all the different phases so that if any phase is missed or is lacking, it is only a partial craft process or ordinary craft (see Pöllänen, 2009). The holistic and ordinary craft concepts describe the design and manufacturing process of crafts and the role of the makers in that process. Therefore, the curriculum emphasises design but also the learner's sense of commitment and responsibility. The aim is that the different phases of the craft process stimulate cognitive, sensorimotor, emotional, and social factors within the learner (see Ihatsu, 2002). Accordingly, making holistic crafts means being bodily, emotionally, and cognitively active (see Mäkelä, 2011; Petitto, 2008). According to the curriculum, craft education is supposed to be implemented in science-based teaching and learning.

According to the Government Decree (2012) on the distribution of lesson hours in basic education, students in grades one to nine currently have altogether 11 weekly lesson hours of crafts out of the 222 total lesson hours of all subjects in basic education. The 11 hours of crafts are allocated so that students in grades one and two have two hours of crafts each week, students in grades three to six have a minimum of five hours allocated to the four grades, and students in grade seven have crafts a minimum of two hours per week. In grades eight and nine, crafts is optional. Schools are allowed to give more annual hours to crafts than the stated 11 hours. Most often, there are two hours weekly of craft lessons for all students from the first to the seventh grade. In some schools, three hours has been stated as the amount of weekly hours devoted to crafts in the seventh grade.

Crafts as a Finnish school subject has similarities with the design and technology education and the technology and engineering education of other countries (Lepistö & Lindfors, 2015; Lindfors, 2015). The English name of the school subject Crafts is translated also as *Craft, design, and technology (CDT) education* in global connections. This translation shows more widely the meaning and the content of the subject. Finnish crafts involves human- and practice-based experiential work with problems and challenges to create usable solutions. Design involves creativity and problem-solving based on aesthetic values and sustainable development (see Väänänen et al., 2017). Thus, design is part of holistic crafts (Pöllänen, 2009) and so-called pedagogical innovation processes (Lindfors & Hilmola, 2016). Technology involves understanding and using technology as a method, tool and technique to design, manufacture, and fabricate innovative solutions on a student level, and in this way, support the development of technological literacy (Jaatinen & Lindfors, 2018).

School practices and challenges with learning outcomes in basic education

Each school subject has its own mission and objectives; however, like other subjects, also crafts is supposed to be implemented in co-teaching (Jaatinen & Lindfors, 2016) and in co-creation with open themes and integrated with explanatory and experimental interdisciplinary projects (Lindfors, et al., 2018; Lindfors & Hilmola, 2016; Pöllänen & Urdziņa-Deruma, 2017). The projects in crafts are realised with various visual, material, technical, and manufacturing solutions (Finnish National Agency of Education, 2014). However, in the latest national learning outcome evaluation in Finland (Hilmola, 2011), 9th grade students' performance in the subject was just under the satisfactory level. A considerable proportion of students did not reach the key objectives even though two thirds were positive towards the subject. The students who elected to do crafts as an optional study in grades eight and nine scored significantly better than other students. The best areas of knowledge were tools and materials, and the poorer results were in product making and methods. Regarding production assignments, the best areas of knowledge were within product-making skills, and the weakest within product design skills. After analysing the data (n=661) more deeply (Lindfors & Hilmola, 2016) three groups of students were found: positive achievers (43%), positive underachievers (29%), and negative underachievers (28%) (Hilmola & Lindfors, 2017). Students who studied the subject in grade nine were

positive achievers twice as often as students who did not study crafts after the seventh grade. In the group of positive underachievers, students had positive attitudes towards design and making in material spaces, but they did not have the knowledge or skills to manage the design task. Studies in the eigth and ninth grade revealed a statistically significant effect on students' performance in the design task. (Lindfors & Hilmola, 2016.)

After studying the national evaluation data more deeply regarding the reasons for the learning results – for instance, in the performance in managing the holistic crafts process – it was found that the theoretical knowledge and attitudes in CDT could not determine it (Hilmola & Lindfors, 2017). Making in managing the holistic crafts process was found to be only 22% based on the pupils' theoretical knowledge, which were related to the tools, materials, design, and attitudes, and which, in turn, were related to the views of the pupils' own skills and learning. The undetermined share was as much as 78%, but the data in the study did not allow an analysis to determine the relevance of this 78%. It might have something to do with the motivation and goal orientation of pupils as well as the authenticity of the learning task. Upon considering the goal orientation of pupils in pedagogical innovation tasks using qualitative data (Lindfors, Heinola & Kolha, 2018), it was found that pupils with learning orientations challenge themselves in a design task, while performance-orientated pupils try to maximise their performance to a high degree and choose tasks a bit lower than their skills would call for. Instead of open design tasks, avoidance-oriented pupils would need more support and tutoring, as well as tasks that would guarantee successful learning experiences for them. Otherwise, an open design task would be a disaster for them and produce negative learning results (c.f. negative underachievers).

As a conclusion for the student level, it is hoped that basic education will meet the ever-increasing need for lifelong learning, innovation, and the need for knowledge and skills to solve the problems of the future (Scardamalia, Bransford, Kozma & Quellmalz, 2011). However, there are still challenges to change the practices that are based on tradition (Ihatsu, 2002; Figure 1), as well as on end-product and skills acquisition (Karppinen, 2008) in an individualistic (Garber, 2002) designing and making process. Designing and co-teaching in holistic crafts has proved difficult to concretise (Pöllänen & Urdziņa-Deruma, 2017). However, new research helps to understand the holistic and pedagogical innovation process from the pupil's point of view (Lindfors, et al., 2018; Lindfors & Hilmola, 2016; Hilmola & Lindfors, 2017). Earlier research has also proven that there are two main issues when considering pupils' engagement in design and making processes, for example, 1) motivation (Autio, 2011) whether they can influence the process, and 2) the meaningfulness of tasks on the basis of their authenticity (Hill & Smith, 2005; Lindfors & Pirttimaa, 2018). These issues are part of the teaching culture of craft, design, and technology that teachers should recognise and develop in a goal-oriented way. There is need for a shift from what the teacher is teaching to what the pupil is learning, and on what basis he/she is engaging in the holistic craft process or pedagogical innovation process. (Jaatinen & Lindfors, 2018.)

Crafts in general upper secondary school

Crafts is not a compulsory subject for students in general upper secondary school. Some upper secondary schools do, however, arrange crafts courses (á 38 hours) in cooperation with other education providers, such as basic education schools or universities. Students with an interest in the subject can, therefore, take part in crafts courses and complete a national diploma course in crafts. (National Agency of Education, 2011.)

National upper secondary school diplomas are offered in the subjects art, crafts, dance, drama, home economics, media, music, and physical education. Introducing the opportunity to complete the diploma is voluntary for upper secondary schools. Upper secondary schools that choose to offer diploma courses will define in their curricula the diplomas that can be completed, and the school is thereby responsible for following the national instructions. The main idea of the diploma is to give students the opportunity

to show their interests and abilities in the above-mentioned subjects in a particular exam. The diplomas complement the same knowledge as the other independent examinations in connection with upper secondary studies, as indicated in the graduation certificate from upper secondary school and the student diploma. (National Agency of Education, 2015.)

The National Agency of Education has determined the national conditions for the completion of upper secondary school, the assessment criteria, and the assessment forms. The topics for the diploma tasks vary annually and are published at the end of spring for the following study year. The national themes for the diploma course in crafts for 2018–2019 consist of five optional topics for the students. The topics are 1) Miniatures (swe Miniatyr), 2) Light, shadows, and surfaces (swe Ljus, skuggor och ytor), 3) Sender (swe Sändare), and 4) Buggy (swe Buggy). The fifth topic is open for all diploma course subjects and is connected to the European year of cultural heritage. The topic is presented as follows: When history meets the future – what is your heritage? (Swe När historien möter framtiden – vilket är ditt arv?) (Utbildningsstyrelsen, 2018).

Teacher education and teachers in crafts

The formal qualification levels of teachers in Finland have been good for some time. Qualified teachers accounted for 90% of full-time teachers in basic education and almost 96% of teachers in general upper secondary education (National Agency of Education, 2013).

Education for teachers in general education has been provided by universities in Finland since 1976 (Seitamaa-Hakkarainen, Pöllänen, Luutonen, Kaipainen, Kröger, Raunio, & Heinonen 2007). The teacher education system is twofold; part of the responsibility for education lies with the faculties of education, while another part is carried out in cooperation with the faculties of different teaching subjects. The faculties of education are responsible for providing education for kindergarten teachers, class teachers, special education teachers, and student counsellors, as well as for subject teachers' education in home economics, crafts consisting of textile and technical work and, to some extent, music (Eurydice, 2013). In general basic and upper secondary education, all teachers are required to have a Master's degree consisting of a minimum of 300 ECTS credits (Eurydice, 2013; Lindfors, 2015).

Two different teacher categories teach crafts: class teachers and subject teachers. Teachers in grades one to six are called class or primary teachers. They have studied pedagogy as their main subject at university and as minor studies, they have studied different school subjects in basic education with a scientific and didactical point of view. Class teachers have a broad knowledge of all subjects in basic education. (Eurydice, 2013.) Crafts in basic education, consisting of grades one to six, is traditionally taught by primary school teachers who have a minimum of 5 ECTS credits in their basic studies or up to 60 ECTS credits from taking crafts as a minor study in their teacher examinations.

Teachers of grades seven to nine and in general upper secondary school are called lower and upper secondary subject teachers, respectively. These teachers have studied their teaching subject as their main subject at university and have added teacher's pedagogical studies at a minimum scope of 60 ECTS credits to gain a general teacher certification. Subject teachers are experts in their teaching subject. Subject teachers who have a Master's degree with at least 140 ECTS credits from crafts in their teacher examinations teach crafts in grades seven to nine and in general upper secondary schools.

The advanced studies in the main subject, which vary from a minimum of 70 ECTS (ÅAU) to 85 ECTS (UEF), are the main content in the Master's level in subject teacher education. Subject teachers who have obtained advanced studies in their teaching subject are qualified to teach in upper secondary education. The aim of advanced studies is for master students to develop a critical attitude and development orientation to his/her future work as a teacher. This is supported through research studies and with participation in research and development projects. By taking part in projects, the students

obtain the newest knowledge in the area and can join in the practical development and research work in schools on various content and material areas of the subject.

In a majority of basic education schools, there are two teachers in crafts: one in technical work and one in textile work. As crafts is a combined, single compulsory subject for all students (Figure 1) but has traditionally had two disciplines, it is now required that the two subject teachers cooperate with regard to students and contents (c.f. Jaatinen & Lindfors, 2016). Due to the reform of the craft subject in basic education (Finnish National Agency of Education, 2016), student teachers will in the future study crafts without material-based orientation, meaning in practice that they will orientate themselves side by side in both so-called "soft" and "hard" materials (earlier textile work and technical work). The target of the reform has already altered the mainly gender-divided image of textile and technical work craft teacher education. This development in teacher education is in a different phase at each of the four universities in Finland; for example at the University of Turku, multi-material orientation started already in 2005. At the University of Turku and the University of Eastern Finland, the new curriculum for 2018–2020 offers no textile or technical work orientation in the graduate degrees. Instead, there are courses in which students will develop competence to use various materials and technologies connected to crafts. Teacher education at the University of Helsinki has also renewed its curricula, and at Åbo Akademi University, the renewal of education in crafts is in progress.

The aim of the reforms in teacher education is to offer student teachers the competence to implement the new curriculum (National Agency of Education, 2014) and to assure that the gender-based tradition (Figure 1) of teaching and learning crafts, design, and technology can step aside (Lindfors, 2015). This concretises the aim that craft teacher education, like professorships, does not concentrate on certain materials, techniques, or products. Instead, it enhances student teachers' pedagogical competence to meet pupils with various experiences and goal orientations (Lindfors et al., 2018). The main aim of craft teacher education is to implement it to confront the varying demands of society, life, and culture. Teachers are expected to be experts in crafts and craft education, but also in various educational settings and sectors in society. Thus, the studies in craft teacher education are conducted with a clear emphasis on research and on the interaction between knowledge formation and scientific thinking in craft, design, and manufacturing processes (Pöllänen & Urdziņa-Deruma, 2017).

Research

The roots of craft science as a discipline can be seen in the handicraft teacher training that started in the Handicraft School in 1881 and especially in the Teacher Department, which was added in 1886 (Vuosisata käsityönopetusta, 1980). The emergence of the disciplines (craft science, craft education, and craft, design, and technology education) has been strongly linked to the development of craft teacher education. Additionally, the history of research in crafts can be seen to extend beyond the beginning of the university-level teacher education in 1976, and especially in 1982, when the first professorship in textiles, design, and manufacturing processes for handmade textiles was established at the University of Helsinki. Thus, the 1990s was clearly an academic discipline-building decade when the name of the professorship was re-named as craft science, the discipline-oriented craft teacher education was instilled, and the first postgraduate students wrote their dissertations (Pöllänen, 2007). The other three universities also obtained permanent professorships: the University of Eastern Finland in 1990, the University of Turku in 1995, and, at Åbo Akademi University, science of sloyd (crafts) education became a major subject in 1995 (Lindfors, 2017).

Gradually, the disciplines in universities have developed into multi-material-based and technology-unbound multidisciplinary research areas. Thus, "craft" refers not only to hand-made objects that have been done with different techniques and from different craft-related materials, but to intricate crafting processes and social and cultural structures, artifacts, meanings, and experiences (cf., Bereiter &

Scardamalia, 2003; Hardy, 2005; Margolis, 2009). The research broadly covers the various aspects and forms of crafts, holistic craft processes, and pedagogical innovation processes with related issues while remembering the technological and engineering perspective in which technological literacy (Lindfors & Pirttimaa, 2018) is one dimension of research.

Today, craft science has its own basic concepts and identifiable objects of research. The paradigm of craft science is situated at the intersection of art, science, and technology, while the paradigm of craft, design, and technology education, as well as the science of sloyd education are pedagogically focused. As quite young sciences, these have methodological and theoretical connections to other sciences, including cultural history, educational sciences, psychology, art history, engineering, physics, chemistry, semiotics and mathematics. Like other applied sciences, the ongoing research in the above-mentioned scientific fields also seek to develop a theoretical basis for craft education with applicable and current methodological solutions.

Research in craft science is primarily based on sciences involving human activity, including psychological, aesthetic-artistic, social, cultural, historical, socio-economic, and natural sciences, as well as technical factors and engineering. Research in craft science has focussed on multi-disciplinary problems and research projects in such a way that methdological issues and theoretical premises are applied to non-material crafts (Pöllänen & Urdziņa-Deruma, 2017). The main research areas are in the design and making processes and in the material and immaterial results of those processes (Seitamaa-Hakkarainen et al., 2007).

In recent years, design-based research projects have significantly advanced the diversity of design processes (e.g., inspiration, design thinking, embodied knowledge, and collaborative designing; see Kangas, Seitamaa-Hakkarainen, & Hakkarainen, 2013; Lahti, 2003; 2008). Emergent insights for embodied ways of making sense through making with hands and the interaction between the embodied mind and the material environment has also been expanded (see Groth, 2017). The research in these studies has had a common pragmatic and iterative approach for combining action and theory. Furthermore, new instruments and methods for analysing design processes were found to be utilised in design research (e.g., neuroscience; see Seitamaa-Hakkarainen, Huotilainen, Mäkelä, Groth, & Hakkarainen, 2014).

As digital design, modelling, and fabrication increases (see Pei, Cambell, & Evans, 2011), the mediation of digital technology obtains new forms and meanings. In this regard, theoretical knowledge and new digital technology can also reframe craft education in the future not only in teacher education but also in basic education. Digitalisation has brought new forums, on-line communities, and new forms of culture for craft makers and thus a new research focus for researchers. These research sources can be found in discussion forums, gaming communities, and digital portfolios, as well as in different local and virtual maker-culture embodiments (see e.g., Vartiainen, 2007; Vilhunen, 2012; Wiklund-Engblom, Hartvik, Hiltunen, Johansson, & Porko-Hudd, 2015). In digital contexts, robotics and automation technology are more used learning environments in engineering types of design. Particularly, pupils' and student teachers' attitudes, as well as the development of technological literacy, will need more research. Furthermore, entrepreneurial mindsets and activities (Elo, 2016; Rönkkö & Lepistö, 2015; 2016), as well as evaluations and the developing of enterprise education in comprehensive and teacher education, will be enhanced by digital technology (Digi Youth, 2018).

The development of new kinds of learning environments and co-teaching are research themes in developing multi-material craft, design, and technology education at the school level (Jaatinen & Lindfors, 2018; Jaatinen et al., 2017), and are thereby extremely important research topics for enabling the multi-material education in schools in the future. Ensuring safe and secure learning and working environments is also a new research area within the discipline. Safety is considered from physical,

psycho-social, and pedagogical perspectives; these include how to document safety incidents and learn from them (Lindfors & Teperi, 2018).

Craft is often connected to the concepts of well-being and quality of life; thus, these have been a main area of interest in craft research. Well-being has been studied, for example, from the perspectives of sustainable craft practices (Väänänen et al., 2017) and meaning making through downshifting and homing (Pöllänen, 2013; Pöllänen & Voutilainen, 2017). The well-being enhancing elements of crafts (e.g., Kouhia, 2016; Pöllänen, 2015a, b; Pöllänen & Hirsimäki, 2014) indicate that there are several possibilities of topics to study. These include domestic craft-making, crafts as a stress-reducing activity, and crafts as a means of activating occupation among elderly persons, unemployed people, asylum seekers and immigrants. On the other hand, the voluntary simplicity, product research, and consumption habits should also be reviewed more clearly as aspects of everyday life and well-being. Current phenomena, such as craftivism (Koch, 2012), knitting cafés, and local area sewing networks (lans) offer insights to new trends in crafts.

Craft science or craft, design, and technology education as new disciplines constantly have new avenues for research. There are great opportunities and both new and old possibilities to gather data and analyse these connecting craft studies to other disciplines, such as future studies, neuroscience, museology, leisure studies, and occupational sciences. Craft research usually has pragmatic connections and an interest to develop craft education and learn more about the teaching and learning processes. Thus, one main research area is situated in craft pedagogy and learning environments. The challenges that the National Core Curriculum has laid out for craft education, as well as the expansion of the learning ecosystems, links craft research with educational and behavioural sciences in the future.

Future work

In the future, Finnish crafts education and research have many challenges to overcome, but also many possibilities for development. Craft, design, and technology education may help people to see the potentials of sustainable consumption and the individual satisfaction of developing one's skills and accomplishing something concrete with one's own hands. Sustainable crafts may serve as a tool for designing and producing sustainable products using materials that take into account their life cycle and the fact that they are meaningful, aesthetic, of good quality and made for the need and aim to increase well-being from the beginning of basic education. There remain, however, challenges in craft education regarding the lesson-hour distribution and the pursuit of aspiration to holistic craft process and pedagogical innovation processes in which students have time to develop ideas and design and manufacture user-oriented and useful products with good quality. Materialisation in multi-material craft as an overall aim has also its own challenges. New pedagogical models to teach technological literacy within design and innovation processes in the digital era is also a continuing challenge.

Furthermore, there is an increased need to take into account the guidance services and products that can support self-oriented craft making. Therefore, there are continual challenges for craft education and a need for new visions of pedagogical models and practices better suited to the increasing complexity, connectivity, and speed of the knowledge society. It is hoped that research-based orientations will serve as a starter for teachers' professional development and intellectual growth through recognition and reflective practices in craft education. The challenges of the university world call for ever stronger cooperation and partnerships between craft teacher education units and the surrounding environment.

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