ICT VERSUS CRAFT IN DESIGN EDUCATION FOR THE GENERAL PUBLIC

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ABSTRACT
In this study, the use of information and communication technology (ICT) in the subject Art and crafts in general education in Norway is examined through a survey and qualitative interviews with teachers. The finding that traditional craft is prioritized above ICT is here presented and discussed. The results show that several teachers view their pupils as "digital natives" who will master the digital tools anyway, while they fear that material knowledge, motor skills and craftsmanship will be lost. The writings of Vetlesen (2015) and Sennett (2008) on the relationship between craft and technology is used to shed light on the teachers' priorities. The term "digital natives" is discussed against Nordkvelle and Fritze's term "medialized", which raises the suggestion that mastery of ICT does not apply to a whole generation. This leads to the conclusion that the subject Art and crafts should include both ICT and craft.

Keywords: ICT, craft, Art and crafts education, design.

1   INTRODUCTION
Information and communication technology (ICT) and craft are often viewed as contradictions in general design education in primary and secondary school. In this paper, we present what Art and crafts teachers in Norway – both those in schools with priority focus on ICT and teachers from schools without such priority – express about this contradiction.
There is a growing number of schools and municipalities in Norway with a priority focus on ICT, where ICT shall be implemented in all subjects, on all levels. In some of these schools the pupils get their own iPad already as six year olds. This study seeks to explore how this focus affects the Art and crafts teachers, and what they report about their priorities between ICT and craft.

2   METHODOLOGY
A mixed-methods approach is used in this study, including a survey and five qualitative interviews. The selection of participants and execution of the study are presented below.

2.1 Survey
Randomly selected Art and crafts teachers participated in the survey; below the participants are called *respondents*. The respondents were chosen through a random draw in Norwegian public schools, both at the primary and secondary levels. The selected schools were contacted and asked to reply with the contact information of their Art and crafts teachers. The survey was sent by email to all the teachers whose information was provided by the schools, for a total of 168 teachers. Eighty-two of these responded, which means that the response rate for the survey was 48,8%.
The survey was a digital questionnaire consisting of 10 questions of different types. The respondents were asked to rate how much they agreed with different sayings, answer multiple choice questions and, finally, write comments about their positive and negative views on the use of ICT in the subject in an open field.

2.2 Qualitative interviews
The interviewed teachers are called *informants*. A strategic selection was used to choose the informants, and they were divided into two groups. The first group consisted of teachers working in schools or municipalities with priority focus on ICT, and they were assigned the code Gr1Teacher(X).

The second group consisted of teachers working in schools or municipalities without such a focus, who received the code Gr2Teacher(X). The informants in group 1 were chosen through a search for schools with a publicly known priority focus on ICT. The schools were contacted and asked to provide Art and crafts teachers willing to take part in an interview. This group consisted of three informants. The second group was recruited through the survey. A question in whether the respondents' school leaders required the use of ICT was used to identify the relevant informants. Less than 10% gave a negative answer to this, so respondents who also answered "partly", combined with little to average use of ICT, was considered relevant. Two of the contacted respondents agreed to participate in an interview. All five informants are well-educated and highly qualified to teach the subject. They have between five and thirty years of experience as Art and crafts teachers, and are working at primary or secondary levels in public schools.

The interviews were semi-structured and lasted between 30 to 60 minutes. The contents of the interviews varied somewhat, but the main topic was how the teachers used digital tools in their classes and which factors, such as access to equipment, their own digital competence and which parts of the subject they wish to prioritize, may explain this use.

3 PRESENTATION OF FINDINGS

3.1 How is ICT used in Art and crafts?

In the survey, the respondents were asked to rate how often their pupils used different digital tools or software and how often they worked with different tasks in class. None of the respondents answered that they used any of the given tools or software in all or almost all classes. The most widely used tools were software for text treatment and presentations, such as Microsoft Word and PowerPoint, and internet search engines. In addition, the most common tasks were internet searches and working with text documents. These are common tasks that can be used in most projects, so it may be only natural that this was most common. As many as 30% answered that their pupils never use subject-specific software, such as Adobe Photoshop, GNU Image Manipulation Program (GIMP), VideoPad and SketchUp, for digital drawing, photo or video editing or three-dimensional (3D-) modelling, as shown in Figure 1.
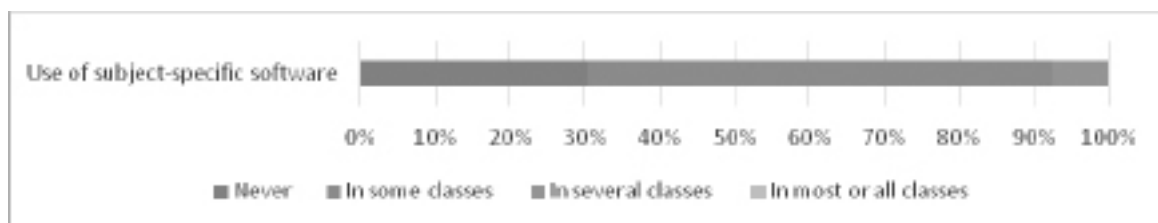

Figure 1. Diagram showing the respondents rating of how often subject-specific tools are used in class. None has answered "In most or all classes"

In the last survey question, the open field, many respondents praised the easy access to inspiration and information provided by internet search engines, but almost as many wrote about great experiences working with photo editing, animation and so on.

The interviews tell the same story. Two of the informants, Gr1TeacherA and Gr2TeacherA, only let their pupils use ICT for making presentations, writing texts and searching for inspiration or information. The other three, although some were limited by lack of software, also taught subject-specific use of ICT. Their pupils worked with tasks like animation, 3D-modelling, mobile photography and photo editing, often combined with traditional techniques such as drawing or woodwork.

3.2 Teachers prioritize traditional craft and experience with materials over ICT

The main aim of this study was to find explanations for teachers' use of ICT. Limitations in access to relevant equipment and insufficient digital competence were both explanations for a lack of ICT-use, but the most important factor may be that the teachers prioritize traditional craft and giving their pupils experience with materials. Many of the informants reported that Art and crafts is not given enough time to fulfil the demands in the curriculum; thus, they need to prioritize some parts of the subjects over others. There seemed to be a perception that crafts are the subject's core element; as Gr1TeacherA expressed in the interview: "(…) I think, in a way, that the main task as an Art and

crafts teacher, is to teach them [the pupils] some craft, whether it's sewing or drawing or..". The same view is also illustrated in the following response from the survey:

> Art and crafts is first and foremost a practical subject. ICT is used a lot in all subjects. In the Art and crafts subject I want to focus on the practical, to teach techniques and practical designs. I use the digital format a lot for the presentation of finished products and in the process of sketching. Otherwise I do not wish to spend time on a computer; rather I want to create and make physical products. (Respondent #50)

Gr1TeacherA worked in a school where all pupils receive their own iPads when they start as 6 year-olds. The iPads are used in all subjects and Gr1TeacherA reported that if a teacher does not want to use this tool, he or she ought to find another place to work. Although everyone is required to use the iPad, Gr1TeacherA clearly stated that she uses it as little as possible in Art and crafts; instead she puts a lot of emphasis on craft. In the interview, she admitted that this could be a reaction to the school's digital focus.

> They [the pupils] get a lot of knowledge about digital tools... all sorts of digital tools really, but what they have less knowledge of, is how to use their hands. It's a lot of touch system and using your index finger to navigate, but somehow… fine motor skills are very under-stimulated. (Gr1TeacherA)

Gr2TeacherA showed a similar attitude towards ICT and craft. With about 30 years of teaching experience, she claimed to have seen a decline in the pupils' practical skills. She no longer expected them to have basic skills, such as cutting with scissors and threading needles, and felt a need to prioritize the training of practical skills through craft. Along with this, she also expressed that ICT should not be the focus in Art and crafts: "(…) it is supposed to be a practical subject and I think that it isn't the use of computers that should be the most important".

Many of the respondents and informants had a positive attitude towards ICT and made use of digital tools in a wide range of ways, but it appeared that many valued the craft part of the subject most highly. This is shown in the following comment from the survey: "(…) But it [ICT] can never replace the value and importance of using tools and materials". Another respondent emphasized the tactile dimension of working with materials as important: "What can be negative [about using ICT] is the eventual lack of direct tactile experience of materials in different processes. An understanding of the material and physical world in Art and crafts is still significant and important".

A more positive attitude towards ICT was apparent in the interview with Gr1TeacherC. Her pupils had worked with photography, photo and video editing, digital drawing and 3D-modeling, but she also had reservations concerning too much ICT in Art and crafts:

> I have to tell you that I put extra weight on the use of practical materials and tools, so really, we are a bit sceptical about using it [ICT] too much. Now, we see that if we use digital tools more, we are afraid of being assigned larger groups of pupils. But we have really good teacher competence, studios and tools here, both for woodwork, sewing, ceramics and everything like that, so it is important for us to work most with that. (…) But it is a supplement to do it [work on ICT] a little, but definitely not too much, I think. It can be too easy to just take out the iPad and do something fun there. It is really important to maintain the quality of materials, knowledge about tools and using pencil and paint and all that. It is really important. (Gr1TeacherC)

Again, traditional craft and working with materials was valued the most, while working on an iPad was mentioned as something that is easy and fun. It is also worth noting that Gr1TeacherC was reluctant to use ICT more from a fear of being assigned larger groups of pupils or losing her well-equipped studio, due to economic cuts. Although she also regarded ICT as an important part of Art and crafts, her prioritizing of craft was also apparent. Based on this, the potential changes mentioned above would be detrimental to the subject.

In the survey, the respondents were asked to rate how much they agreed with the following statements: "In my classes I put weight on ICT" and "I prioritize traditional craft and materials over ICT in my classes". The responses to this question clearly showed that many of the respondents prioritized traditional craft and materials, while quite few put weight on ICT. For both statements, about a quarter of the respondents placed their responses at the middle of the scale, but most of them seemed to have a clear opinion on this. The respondents' answers are shown in Figure 2.
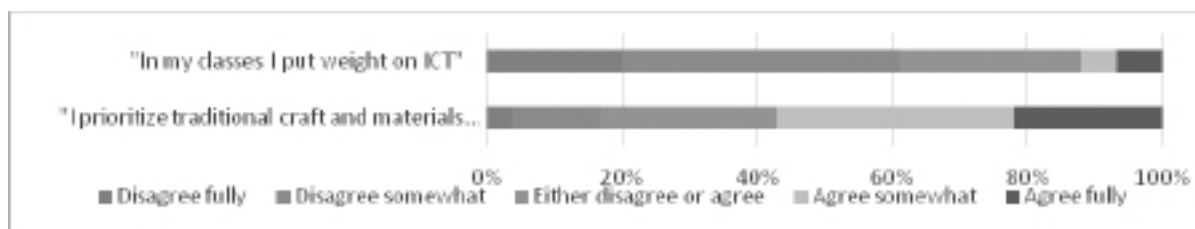
Figure 2. Diagram showing the distribution of the respondents answers, rating how much they prioritize ICT and crafts in their Art and crafts classes

In the open field at the end of the survey, many of the respondents chose to express their views on the relationship between craft and ICT. Some of these comments were quoted above, while some are presented below.

The curriculum implemented in 2006 included a prominent position for ICT. Digital skills are regarded as one of five basic skills that should be incorporated into all subjects to develop pupils' abilities. This may be why some of the respondents reported that ICT is taking over their teaching curriculum at the expense of more traditional techniques, as shown in the following comments from the survey:

> "Find it unfortunate that the focus on practical craft disappears, everything drowns in the digital"
>
> "[ICT] may "steal" too much of the time and the craft part will be compromised."
>
> "I don't see a lot of negative sides if it [ICT] is used with sense. It must not take over for the craft where you work with your hands."

In these quotations, it is possible to see a fear of ICT dominating Art and crafts, pushing the crafts out. In the interviews, Gr1TeacherA and Gr2TeacherA expressed a worry about a neglect of pupils' practical and motor skills. Craft still has a prominent place in the curriculum, but many children and youngsters spend a large part of their spare time on computers and other digital tools. Gr1TeacherA did not view it as necessary to spend time at school to teach the children about this.

> Well, I think that everyone now has so many digital things at home, at least I see my children spending time with this, taking pictures, manipulating them and doing so much with these pictures, adding filters and.. it's not necessary to teach them because they know how to do it. (Gr1TeacherA)

Gr1TeacherA expressed her view on the pupils as "digital natives" who will master ICT anyway; as a result of this, she was comfortable with her priority of craft.

4   DISCUSSION

The study showed that many teachers prioritized craft and teaching pupils to work with their hands and materials over ICT. This was justified through their observation that pupils lack motor and practical skills, while they may be able to acquire digital skills on their own. The teachers also seemed to place the highest value on the craft aspect, perceiving that teaching craft skills is the Art and crafts teacher's most important task. In order to understand these findings, they are discussed in relation to Arne Johan Vetlesen's and Richard Sennett's writings on the relationship between technology and craft. Marc Prensky's and Yngve Troye Nordkvelle and Yvonne Fritze's articles about digital natives are also discussed. Below is a short presentation of the literature.

Vetlesen is a professor of philosophy at the University of Oslo. *The Denial of Nature* (2015), one of his latest books, is a study of the relationship between humans and nature. One of the chapters is devoted to technology and is used in this discussion.

Sennett is a professor in sociology at New York University and London School of Economics. In *The Craftsman* (2008) he has written about craft and the characteristics of the craftsman.

Prensky started as a teacher, and is now a speaker and writer on education. He may be best known for his term "digital natives", discussed below.

Nordkvelle and Fritze, from the institute of pedagogy at Lillehammer University College, argues against the term "digital natives" in the article *Digital immigrants or just medialized*. Instead they propose the term "medialized".

According to Vetlesen, technology allows for less physical and sensuous experiences with our surrounding world, as sight is favoured over hearing, smelling and touch [1:167]. Much content in the

Art and crafts classes stimulate all four of these senses – pupils hear the difference when knocking on wet and dry ceramics, smell different types of wood and touching different types of yarn – while sight is prioritized in all parts of the subject. The lack of physical and sensuous experiences from ICT may explain the teachers fear of losing the craft part of the subject Art and crafts.

Sennett's definition of craft is quite wide, including musicians, glass blowers, scientists at a laboratory, architects, Linux-programmers and weavers. His definition therefore exceeds the limits of the Art and crafts subject, and does not divide between work with materials and digital work. For Sennett, *craftsmanship* is about the wish to do good work for its own sake [2:20]. However, Sennett still warns against replacing experience with the physical world with digital simulation when he writes about architects using 3D-modelling or computer aided design (CAD). By using only digital tools in planning instead of spending time on the location, making sketches and drawings by hand, the architect loses an understanding of materials, proportions and other physical properties. Without that understanding, important design problems may appear [2:39-45]. Some of the dangers here relate to the quick calculations of digital simulations, while drawing each brick in a building takes a long time. Several times in the book, Sennett emphasize the slowness of craft, both in gaining skills and working with single products, as important. Time allows for reflection and creativity. Quick solutions, such as digital simulation, does not provide the craftsman with enough time to reflect on his or her choices [2:295], and the final product may exhibit flaws that should have been discovered earlier in the process.

In Sennett's warnings against digital simulation, there is also a valuation of physical, sensuous experiences with materials and places. Vetlesen has written more on technology replacing these experiences with our surrounding world, comparing the traditional felling of trees with the use of a modern forestry vehicle, a discussion that was inspired by a meeting with such a vehicle. The forestry vehicle is operated through pushing the right keys while looking at a screen, in a similar manner to writing a text although the task is completely different. The main attention of the operator is oriented towards the screen, with occasional glimpses of the tree to make sure the process is going well. This is a huge contrast to the traditional felling of trees, where the carpenter physically engages with the trees, using his or her senses and handling the different obstacles at hand. In the forestry vehicle, every tree feels the same, making a single tree an almost abstract entity that is not experienced in a physical or sensuous way. The machine stands between the man and the tree – subject and object – making a direct contact between them superfluous [1:147-149].

> The change that interests me is not primarily a matter of man's relating to the tree being mediated by a machine (computer) that literally is an in-between between subject and object. Rather, and more profoundly, it is a matter of the subject-outer reality relationship – a two-way affair, as we saw – being *replaced* by a man-machine (technology) one.
> [1:148-149]

Vetlesen explains a phenomenon that may be difficult to put into words. Based on this study, it is apparent that experience with materials is highly valued among Art and crafts teachers. However, none of the participants in this study justified *why* this is the case; rather they simply stated that it is extremely important. If we accept Vetlesen's assertion about the use of technology leading to abstraction, it is easier to understand the fear of ICT taking over Art and crafts, thereby compromising the craft component.

Sennett draws the line of craft backwards, including to the 19th century's growing machine culture. Against the machine's perfection, the craftsman became a symbol of human individuality, directing attention towards variations and small mistakes in the products [2:84]. In the Victorian age, there was a growing concern that the large number of identical objects could dull the senses. The identical, perfect, mass-produced products did not invite a personal relationship [2:109]. More than one hundred years later, after the digital revolution, these thoughts are still relevant. In this study, we encountered the perception that digital artworks are less personal. Gr2TeacherA called this a negative aspect of the use of ICT in Art and crafts.

> It can be very impersonal, I think. A bit artificial. Lifeless. If you are making stuff on the computer. And it is very, like.. things can look very alike. I'm thinking about a personal expression, that is something I find very important. (Gr2TeacherA)

A personal expression is highly regarded, along with craft skills, by Art and craft teachers in their evaluation of the pupils' work [3:iii]. One may consider whether Gr2TeacherA's statement about

digital drawings being impersonal is in fact true, but it justifies her lesser prioritizing of the digital part of Art and crafts.

Gr1TeacherA expressed that it is not necessary to teach pupils about ICT because they can learn it on their own. This can be linked to the term "digital natives" coined by Prensky. According to Prensky, children born after the digital revolution think and process information differently than those who are older – called "digital immigrants" – because they have spent their lives surrounded by digital tools and media. The digital natives are accustomed to rapid information processing and multitasking, they prefer pictures and graphics over text and games over "serious" work. The "immigrants", in contrast, may adapt to the digital community, but they will always be revealed by an "accent", an outdated, pre-digital language [4:1-2].

Nordkvelle and Fritze present arguments against the term digital natives in the article *Digital immigrants or just medialized*; instead they propose the term "medialized". While the label "digital native" is put on a certain generation, medialization describes how much your life is affected by technology and media [5:71], and therefore it transcends generations. Although most Norwegian youths have access to some digital technologies, according to the studies discussed in Nordkvelle and Fritze's article, differences related to gender, social class and interests affect their digital skills [5:68]. Based on this, saying that children will automatically master ICT seems too easy. Thus, schools need to provide all pupils with some basic digital skills, to equalize a potential knowledge gap. If a school has a special focus on ICT, all subjects should be included and pull the load. Craft has a special place in Art and craft, but that does not mean it should be the only part of the subject. To ensure that pupils gain the digital skills necessary for the 21st century, along with sufficient practical and motor skills, teachers should find a way to include both ICT and craft in the subject.

5   CONCLUSION

This study showed no significant difference between schools with and without a priority digital focus, in the subject Art and crafts. In fact, the informant who state most vehemently that she avoids ICT, was working at the school with the highest implementation of ICT.

Most participants in the study put weight on craft, developing practical and motor skills, working with the hands and gaining experience with materials. Vetlesen and Sennett shed light on the value of craft and materiality in their respective writings. According to them, technology may lead to an abstraction of our surrounding world and give less physical and sensuous experiences, meaning that we will have less of an understanding of our surroundings. Art and products made with ICT may also become less personal, while personal is something that is highly regarded in Art and crafts.

Some of the participants in the study expressed that it is not necessary to teach their pupils how to use ICT, as they will master the tools on their own. This is not necessarily true for all children and youths, as differences in gender, social class and interests affect their digital skills. The schools must therefore take responsibility to provide all pupils with the necessary skills for the future.

Craft and materiality are highly valued by Art and crafts teachers and should remain so, but there is also a need to include ICT. If the question is ICT, craft or both in design education for the general public, we propose that the answer should be *both*.

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