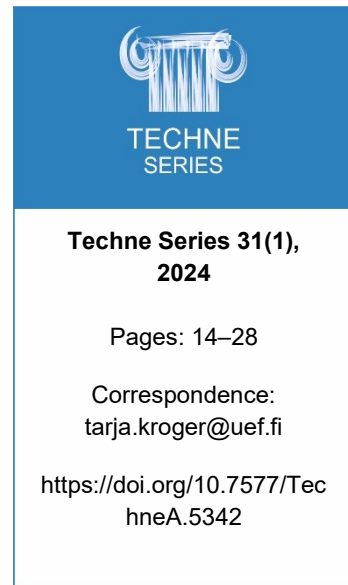


Student teachers' attitudes to materials in the contexts of crafting and consuming

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The purpose of this study was to explore the kinds of attitudes student teachers have towards materials in the contexts of crafting and consumption. The practical aim of the study was to encourage students to explore the materials of the crafts they make and the products they buy. The data were collected via semi-structured inquiries conducted as part of the course Experimental Textile Crafts. In addition to the questions, the elicitation method was used, that is, the students were asked to choose one of their own craft objects and one purchased object and take photographs of them. The final sample consisted of 39 students. Data were analysed using thematic analysis focusing on affective, conative and cognitive components. The findings of the study highlighted three different ideal types of students: (1) Superficially Oriented, (2) Safely Mediocre and (3) Conscious. Superficially Oriented Students have little interest in materials. Safely Mediocre students did express interest in materials but ended up using familiar materials in both crafting and consumption. Conscious students expressed sustainability concerns, which crossed a wide range of topics from valorising waste to naturalness in materials. The results can be valuable for developing craft teacher education and for future research.



Keywords: attitudes, crafting, consuming, ideal types, materiality, materials

Introduction

Materials are essential to craft. Materials are so important that crafts are categorised and identified by material. (Risatti, 2007; see also Kröger & Turunen, 2021) According to Sennett (2009), there is a dialogical relationship between the hand, the material and the mind. Aktaş and Mäkelä (2019) discussed the negotiation between the material and the maker, where the material affects both the thinking and doing. The cooperation amongst the hand, material and mind can also be called ‘thinking through materials’ (see Adamson, 2018; Nimkulrat, 2010, 2012) and embodied knowledge construction (see Groth, 2016; Groth & Mäkelä, 2016) or embodied experience (see Härkki, Seitamaa-Hakkarainen & Hakkarainen, 2016).

In design research, there is talk of a paradigm shift in the perception of materials. In design, materials are no longer seen as something static and ‘given’, which are applied in design. Instead, materials are understood to be dynamic and open to change. The designer’s task is to actively search for new potential in materials. (Karana, Barati, Rognoli & Zeeuw van der Laan, 2015; Karana, Nimkulrat, Giaccardi, Niedderer & Fan, 2019.) Designers do not only select materials by focusing on technical properties and performance, but also explore their experiential qualities instead of defining material requirements for product realisation (see Sörensen, 2018). This change is based on, among other things, the close cooperation amongst different research fields (materials science, materials engineering and design research). For example, textile designers and materials scientists have collaborated to create materials starting from the molecular level (Niinimäki et al., 2018). The development of new sustainable materials

is another example of collaboration between design and materials research (Kääriäinen & Niinimäki, 2019). Practical do-it-yourself (DIY) biotextile manufacturing techniques have also emerged that are suitable for anyone with an interest (see e.g. Bell et al., 2022; Dunne, 2018; Kääriäinen, Riutta, Tervinen & Vuorinen, 2020).

Materials are, therefore, important for both designers and makers. On the other hand, the relevance of materials can be approached through their effects on the environment and the use of natural resources. The planet can be protected from pollution through, among other things, sustainable consumption and production methods, which can include an understanding of different materials and their properties (see Räisänen & Laamanen, 2014; Salolainen et al., 2022; Väänänen, 2020). Familiarisation with materials through crafts arouses knowledge of, respect for and a sense of responsibility towards nature (Kouhia & Laamanen, 2014; Väänänen, 2020). Kojonkoski-Rännäli (1998) described the unique meaning of 'making by hand' as a production method where the creator's embodied connection to the material is created and maintained. The experiential knowledge of the material that can be gleaned in this way is the path to respecting the material and its source: nature. Working with one's own energy and one's own skills teaches one to be critical of human production activities in general. With the help of this kind of human development, sustainable solutions can also be achieved in dealing with our increasingly overwhelming ecological problems. (Kojonkoski-Rännäli, 1998; see also Kojonkoski-Rännäli, 2014.)

The results of consumer surveys (see Notaro & Paletto, 2022), for example, show that the young generations have positive attitudes towards the environment, but it is not a given that these attitudes will transform into sustainable consumption. Karana (2010), on the other hand, found that the meanings given to the materials are primarily based on personal experiences, memories or mental images. Craft enables a personal interaction (embodied way) between the maker and the material and can thus change attitudes towards sustainable consumption in learning to understand and use materials in a sustainable way. (Karana, 2010; see also Karana, Hekkert & Kandacher 2009; Latva-Somppi & Mäkelä, 2020; Väänänen, 2020.)

The materials, therefore, have a dual role. On the one hand, material knowledge is seen as useful for designing and making crafts and, on the other hand, for critical consumption (Kojonkoski-Rännäli, 2014; Mehto & Kangas, 2022; Mehto, Riikonen, Hakkarainen, Kangas & Seitamaa-Hakkarainen, 2020). Materials also have a dual role in the sense that they are both informative content (explicit material knowledge, so-called material theory) and a tool for design, where experiential knowledge about materials is gained through practical activities (see Salolainen, 2022). Information acquired in this way can also be called tacit information (Zhou & Rognoli, 2020).

Thus, as part of craft teacher education, student teachers need to develop their materials expertise, which includes contextualising, evaluating and selecting materials both as craft makers and consumers. Therefore, the practical aim of this study was to encourage students to explore the materials of the crafts they make and the products they buy. The research task of this study was to explore the kinds of attitudes student teachers have towards materials in the contexts of crafting and consumption. The empirical part is supported by defining the key concepts of the study (materiality and attitudes to materials) and presenting previous research on the topic.

Materiality

The study of the materiality of the world consists of several research traditions. The following is a brief overview of the research areas relevant to the study.

Materiality in materials science and materials engineering

Materials science and materials engineering focuses on the study of the relationships that exist between the structures and properties of materials and the application of materials knowledge to the design or engineering of the structure of a material to produce a given set of properties (Callister & Rethwisch, 2021). In materials science and engineering, solid materials are grouped into three basic categories: metals, ceramics and polymers, based primarily on chemical composition and atomic structure. In

addition, there is the group of composites. These are engineered combinations of two or more different materials. (Callister & Rethwisch, 2021.)

Materiality in design research

In design research, researchers are interested not only in the mechanical properties but also the intangible aspects of materials, such as the sensory and expressive properties of materials and their cultural meanings (see e.g. Hekkert & Karana, 2013). The sensory properties of materials affect whether a product provides adequate feedback and a pleasant emotional experience (van Kesteren, Stappers & de Bruijn, 2007). The cultural meanings of materials are mixed and complex depending on the social context in which the materials are used and consumed (Liu, 2020).

Materiality in consumer behaviour

Consumer research is a broad field of study with many subfields. Here, we will focus on *consumer behaviour*. Consumer behaviour refers to the study of 'how individuals or groups buy, use and dispose of goods, services, ideas or experiences to satisfy their needs and wants' (Kotler, Keller, Brady, Goodman & Hansen, 2016, p. 218). The study of consumer behaviour can be divided into three interdependent dimensions: the study of culture, the study of social groups and the study of the individual. The cultural dimension includes, among other things, the influence of subcultures and social class. Social factors include peer groups, family, social roles, and status. Personal characteristics such as the buyer's age and stage in the life cycle, occupation and economic circumstances, personality and self-concept, and lifestyle and values also influence the buyer's decision-making process. These three dimensions are interdependent, i.e., they influence each other. The individual interacts with the cultural and social environment, but the starting point for understanding consumer behaviour is the consumer himself. (Kotler et al., 2016.)

New materialism is one approach to studying consumer behaviour. In new materialism, materials are not passive objects influenced by people, but active participants in the events that affect people; they are also shaped and transformed by consumption (Bennett, 2010). Such a view of materiality addresses material interaction as a form of engagement with materials (Kouhia 2020). Kettunen et al. (2022) studied how material garments collaborate sustainably with the consumer in the new materialism framework. By analysing consumers' written reflections on their relationships with clothing, they claimed that the consumer and clothing determine each other's agency and can change unpredictably. Clothing consumption is a multifaceted temporal cycle, in whose examination can be found critical moments in terms of sustainable consumption.

Materiality in craft science

In craft science, materiality is a crucial factor in defining craft. Craft cannot exist without material: if there is no material, there is no craft activity. Crafts are significant precisely because of their materiality and concreteness through which they become objects of interpretation (cf. Woodward, 2007). All crafts are inseparable from material culture (Kouhia, 2012). As a concrete attribute, materiality can be combined with tools and materials (Kojonkoski-Rännäli, 2014) resulting in a craft product (Kouhia & Laamanen, 2014). In addition to the material essence of a craft product, materiality means a working process through materials (Kouhia & Laamanen, 2014), where the material can be a source of inspiration and motivation to create (Kouhia, 2012). Working on the material involves the sensory effects, mental images and expressive elements of the author (Kouhia & Laamanen, 2014). Although the material to be worked with creates unpredictability and forms endless rhizome-like connections, it can also help to work in the midst of uncertainty (Mehto & Kangas, 2022). Furthermore, Mehto and Kangas (2022) highlighted in their research that social, ethical and ecological issues are always present in the use of materials, regardless of whether they are consciously addressed or not. Materiality is also closely linked to sustainable development through the concept of 'sustainable craft'. Väänänen (2020), in her doctoral

thesis, pointed out that the material perspective is the most concrete way to reduce and assess the environmental impact of a product. An understanding of sustainability begins with the material interaction between the maker and the product, and deepens through reflection (Väänänen, 2020).

Materiality in educational context

The educational context for teaching material knowledge and skills is also an important aspect of this research. The Material-Driven Design method was developed to support the integration of material knowledge and design learning (Karana, Barati, Rognoli & Zeeuw van der Laan, 2015; Sörensen, Jagtap & Warell, 2017). In Material-Driven Design, materials play a central role throughout the design process. The method encourages practical interaction with the material from the first encounter. The method guides the exploration and understanding of the material's unique properties and the limitations of the material from the outset. Working with an exploratory approach, the designer gains an in-depth understanding of the material, such as its expressive and physical properties and the material's purpose in its context. The method suggests that the material should not be defined only by what it is, but should focus on the material experience, that, what the material expresses and makes one do (Karana, Barati, Rognoli & Zeeuw van der Laan, 2015).

Material Tinkering is another method developed to support the integration of material knowledge and design learning (Parisi et al., 2017). Material tinkering grounded in experiential learning is based on a creative and direct experimentation on materials. The method uses crafting as an inspirational and creative driver to enhance design. (Parisi et al., 2017.)

Design education has also developed different methods for teaching and learning the 'dual language of materials', that is, the correspondence between measured material properties (tangible materials) and sensed material characteristics (intangible effects) (see e.g. Pedgley, Rognoli & Karana, 2015). These methods include, among others: 1) the generation of materials knowledge via the analysis of the material samples and product exemplars, 2) the development of a sensorial-expressive language of materials, 3) the consideration of the materials as a user interface of a product, 4) the awareness of the contextual considerations that limit the materials selection and moderate material experiences and 5) the use of new material selection tools to guide the experiential-based material selection activities (Pedgley, 2014).

Furthermore, Haug (2019) developed a framework that defines three different ways to acquire material knowledge: (1) material-produced knowledge, (2) interpreter-produced knowledge and (3) representation-produced knowledge. Material-produced knowledge is acquired by observing, interacting and working with a material. Interpreter-produced knowledge is acquired by communicating with others. Representation-produced knowledge is acquired through various types of descriptions, such as through text, diagrams, pictures and videos.

Craft education in Finnish basic education emphasises knowledge of the materials as part of the process of designing and making craft products, where the maker attempts to choose materials and processing techniques that are appropriate for the product. At the same time, the use of craft materials expands the understanding of the surrounding material world, which helps the learner to perceive a sustainable lifestyle and development as a critical consumer. (Finnish National Agency for Education, 2014; see also Väänänen, 2020.)

Attitude to materials

Making with your hands and knowing materials is an essential part of being human. Processing materials with the hands is a natural activity for humans where the hands act as tools to sense the world (Kojonkoski-Rännäli, 1998). According to Kouhia and Laamanen (2014) (see also Miller, 2005), it is about the dialectical relationship that manifests the interaction between the material and the maker. The interactional relationship shapes the maker's world of experience, meaning and understanding in a

socio-cultural, time- and place-related context. Through experimenting and making, the maker develops a personal interactional relationship with the material that is embodied in his or her own 'handwriting'. Through the interactional relationship, the maker should reflect on his or her choices and justifications for why it is made and from what materials. (Kouhia & Laamanen, 2014)

An attitude is 'a relatively enduring organization of beliefs, feelings, and behavioural tendencies towards socially significant objects, groups, events or symbols' (Hogg & Vaughan 2018, p. 154). The classic three-dimensional approach describes the attitude according to its components: the affective, conative and cognitive. The affective component involves the emotions and feelings that people have about a particular topic or object. It includes whether a reaction is positive or negative, good or bad, desirable, likeable or an evaluative judgement. The conative component of an attitude refers to the intentions to behave in certain ways in relation to a particular topic or object. It is sometimes called the behavioural component of an attitude. The cognitive component involves the beliefs and knowledge that people have about a particular topic or object. It refers to the person's thoughts, perceptions or ideas about the object of the attitude. (See e.g., Hogg & Vaughan, 2018; Wolf et al., 2020.)

There is no clear link between attitudes and overt behaviour, and not all behaviours can be predicted accurately from verbally expressed attitudes (Hogg & Vaughan, 2018). For example, Notaro and Paletto (2022) investigated whether younger generations in Italy have better environmental attitudes towards environmentally friendly clothing (such as bio-textiles made from sustainable wood fibres) and the corresponding willingness to pay for them. The results show that those of younger generations place more importance on the environmental impact of their purchasing decisions than those of older generations but that they buy less green clothing. Furthermore, the younger generations' attitudes and willingness to pay for bio-textiles made from sustainable wood fibres are more influenced by environmental attitudes; however, this does not translate into a greater willingness to pay for them.

Research question

The purpose of this study was to answer the following question:

What kinds of attitudes do student teachers have towards materials in the contexts of crafting and consumption?

'Attitudes towards materials' refers to the way that student teachers feel about and evaluate the materials that they use in their crafts and encounter in their daily lives as consumers. Specifically, the attitudes have an affective component (i.e. material preferences), a conative component (i.e. material choices) and a cognitive component (i.e. acquiring materials knowledge).

Data collection and participants

The data for this study were drawn from semi-structured inquiries conducted as part of the course Experimental Textile Crafts, which is the first textile course of the basic studies of craft science in the University of Eastern Finland. The student teachers queried studied craft either as a minor or major subject. The semi-structured inquiries were conducted through an online questionnaire on the Forms platform. The students were asked to describe the materials of the craft product and the purchased product and how they ended up with the materials in question. They were also asked questions about their knowledge of materials, such as where or how they acquired their information about the materials, which school grade would describe their knowledge level of materials and what they would like to learn more about regarding materials. The students were also asked for background information: gender identity, whether they studied craft as a minor or a major, age, how often they engaged in crafting and what kind of crafting they engaged in during their free time.

In addition to the questions, the students were asked to choose one of their own craft objects and a purchased object and take photographs of them. This is called the elicitation method (Iltanen & Topo, 2015; Woodward, 2020). According to Woodward (2020), to elicit means to draw out, to prompt or to excite. Elicitations can be helpful in drawing out narratives, comments or experiences that might not otherwise have emerged. They can also elicit a different kind of response, such as a more emotional or unexpected discussion. Object elicitation can engage with materiality in a fully multi-sensory way. (Woodward, 2020) In this study, the analysis relied mainly on the questionnaire; the images complemented and supported the analysis.

Specifically, the questions included three perspectives: (1) an affective component, (2) a conative component, and (3) a cognitive component. The affective component included questions about material preferences: 'Do you like or avoid certain materials when making crafts and why? Do you like or avoid certain materials when shopping and why?' The conative component included the tasks related to the material choice task: 'Tell us how and why you chose the craft material(s) in the photograph. Tell us how and why you decided to buy the product in the photo'. The cognitive component included tasks and questions related to material knowledge acquisition: 'Describe the craft material(s) in the photo as accurately as you possible. Describe the material(s) of the purchased product in the photo as accurately as you possible. Where or how did you learn about the materials? What would you like to learn more about regarding materials?'

Of the 41 enquiries, two of the participants were excluded from the study because they did not give permission for their answers to be used as research data. The final sample consisted of 39 students, 24 females (62 %) and 14 (36 %) males. One student did not indicate gender. Most of the respondents were aged between 18 and 25 years (79%) and the remaining eight were aged between 26 and 55 years. The respondents reported that they made crafts in their spare time: less frequently than monthly for 12 respondents, monthly for 12 respondents, weekly for 11 respondents and almost daily for 4 respondents. The students rated their knowledge of materials as 7.1 on a scale of 4 to 10.

Data analysis

Ideal-type analysis (Eneroth, 1984; see also Anttila, 2005) is a qualitative research method where material is organised according to ideals and caricatures. Stapley et al. (2022, p. 2) stated that 'In a nutshell, it involves the systematic comparison of cases or participants within a qualitative dataset to form "ideal types", or groupings of similar cases'. According to Stapley et al. (2022) there are seven steps for ideal type data analysis: (1) becoming familiarised with the data set, (2) writing the case reconstructions, (3) constructing the ideal types, (4) identifying the optimal case, (5) forming the ideal type descriptions, (6) credibility checks and (7) making comparisons.

We proceeded by applying Stapley's steps. The first step of the analysis was searching for themes in the dimensions of analysis (attitude components). The dimensions of analysis come from attitude theory, which divides attitude into three components: the conative component (respondents' material choices), the cognitive component (the acquisition of knowledge about materials) and the affective component (material preferences). In practice, the attitude components were taken into account in the design of the questions as described in the previous chapter. Table 1 shows examples of the data analysis according to the attitude components.

Table 1

Attitude components and data extracts

Attitude component	Data extracts
Affective: Material preferences	'I prefer, for example, viscose, cotton and other materials that are not sweaty or uncomfortable. I avoid sweaty materials, especially for formal wear'. F2
Conative: Material choices	'I've used 7 Brothers yarns to make other wool socks before, so I knew that the yarn would be suitable, durable and comfortable to the touch. So, I chose a material that I knew and trusted'. F3
Cognitive: Acquiring material knowledge	'When knitting and crocheting, I have compared different instructions to get an idea of which yarns are suitable for which types of work. I have discussed the properties of materials with friends and family. I have visited different websites on the internet that give information about the properties of materials [...] I would like to learn more about the properties of materials so that I can consider different options in my own projects and product designs and be able to compare which material would be best suited to make a product [...] I feel that knowledge of materials is an important skill in modern times, as there is an increasing desire to work in a sustainable way'. F15

The next phase of the analysis involved the identification of the ideal types. For each dimension of analysis, three different approaches seemed to emerge, based on which we formed preliminary types. The next step was identifying relationships and connections between the different types: we refined the ideal types by going through the data on a case-by-case basis (per student). The final phase was forming type descriptions.

Results: The ideal types

This study identified three ideal types of students: Superficially Oriented, Safely Mediocre and Conscious. These ideal types were formed based on the features each participant highlighted regarding their attitudes to materials. The focus was on discerning the relationships and connections between the different substantial features, meaning that none of the participants could be categorised as a particular ideal type. On the contrary, their characteristics can be found within several different ideal types. The three different ideal types found are presented below. Each ideal type description includes references from the participants who demonstrated elements that matched the description of the particular ideal type.

Superficially Oriented Students

I prefer cheap and readily available materials [in crafts]. F4
It [the shop-bought blouse] was cheap and nice. F4

The material preferences of the *Superficially Oriented Students* were low: the materials as such did not seem to matter much; their answers only mentioned the individual properties of the material. For example, F4 expressed a preference for cheap and readily available materials regarding crafts. Likewise, when describing a shop-bought blouse, the same student commented that it was 'cheap and nice'. In contrast to the *Conscious Students*, who may have specific preferences for certain materials and their qualities, the *Superficially Oriented Students* seemed content if the item in question met their basic

requirements of being low-priced and visually appealing. This may reflect a superficial approach to materials and a lack of interest in exploring the nuances and potentials of various materials.

The materials [for the craft product] were given as ready. M11

It [the shop-bought cap] is a quality brand that will last. M11

For the *Superficially Oriented Students*, the choice of materials may not have been independent; the craft material may have been recommended or specified by the teacher, by the recipient of the craft or by the written instructions. The choice of materials for both handmade and purchased products can also be based solely on chance, on price, on brand and/or on aesthetics.

I have mostly got[ten] my information from the internet. I'm not into the hobby yet. M11

Superficially Oriented Students mentioned only one or two channels for obtaining information. For example, Google or the Internet were often mentioned as the only channels for obtaining information. They did not actively seek out information from varied sources. They may simply have been looking for quick and easy ways to make a craft or buy a product without investing much time or effort into it. However, it is important to note that this does not mean that they did not enjoy crafting, but rather that they might have approached it in a more casual manner.

Safely Mediocre Students

I prefer wood because of its easy availability and ease of processing. At home, I don't have the tools to work with metal or ceramic materials. A knife and a saw are sufficient for working with wood. I can't get anything done with yarn or fabrics, probably because of my low know-how. This discriminates against materials that you can't even think of being useful for a project. M23

I don't really avoid any materials [when it comes to the purchased product]. M23

Safely Mediocre Students often pointed to the familiarity or know-how of the material when making a craft. They preferred materials that they were comfortable working with, and were familiar with. These students prioritised know-how in their craft projects and were willing to compromise on certain aspects in order to ensure that their creations were functional for themselves and others. The *Safely Mediocre Students* sought a balance in their projects, choosing materials that were easy to work with but that still provided durability and functionality. They valued the materials that could withstand wear and tear, ensuring that their creations could be used over the long-term. They prioritised materials that were easy to work with' however, they did not take any risks with materials. For some, familiarity with the material was also important when buying a product. Others said they did not avoid anything, as in the example above (M23).

I've used 7 Brothers yarns to make other wool socks before, so I knew that the yarn would be suitable, durable and comfortable to the touch. So, I chose a material that I knew and trusted. F3

The table top is made of wood veneer and the legs are made of steel. I bought this product because I thought it was beautiful and suitable for my apartment. I also had a clear need for the product. F3

The availability of the materials and suitability for the purpose were important issues for the *Safely Mediocre Students*. These were students who valued practicality in their choices, including the choice of materials for their craft projects and purchased products. For them, ensuring the availability of the material for their craft project was a top priority. They sought a balance between function and aesthetics. They looked for materials that were not only functional but also visually appealing. They may also have considered factors such as the ease of use and cost-effectiveness when selecting materials. They valued the suitability of the material for its intended use. A material that is durable, easy to work with and comfortable to the touch can make a significant difference in the final product. For this reason, these students often turned to materials they knew and trusted, as familiarity with a particular material can provide a sense of confidence in its performance.

My knowledge of materials is not yet very extensive. I have often heard from my mother, for example, about the properties of a material, why it is or is not to be preferred. F13

For *Safely Mediocre Students*, the role of the school or home as a mediator of knowledge is obvious. These students place a high value on safety and stability, and as such, they tend to rely heavily on trusted sources of information. This often means relying on authority figures such as teachers or parents to provide information about materials and their properties. They rely on someone with expertise and authority to provide accurate information, which means seeking out reliable sources of information and carefully evaluating the credibility of the information being presented.

Conscious Students

Basically, I don't avoid any materials in crafts. Sometimes when I was making crafts, wool irritated my nose, so I tried synthetic yarns, and my experience was surprisingly positive. I had my prejudices about synthetic yarns. Nowadays, I'm particularly concerned about the ethics and ecology of yarns, but I'm keeping a budget in mind. I'm trying to find a happy medium in between. F39

I prefer second-hand clothes and furniture when buying products. I prefer high quality and "authentic" materials. Sometimes when I go shopping, I feel like doing an impulse buy, but having owned a few synthetic knitwear, I realise that they are not a sustainable purchase. I avoid unnecessary purchases and if I buy, for example, a fast fashion item, I try to use the product as well and as long as possible. F39

Crafting is a good way to express creativity and produce beautiful objects that can bring joy and utility to our lives. However, as conscious individuals, it is also important to consider the impact that materials have on the environment and the people involved in their production. The *Conscious Students* were aware of the ecological and ethical aspects of their material choices and made conscious efforts to source materials that are sustainable, ethical and environmentally friendly. This includes looking for materials that are free from harmful chemicals and dyes. In addition, some students sought information about the origin of their materials in order to ensure that they were not supporting exploitative practices or contributing to environmental degradation. This may involve researching the companies and suppliers of the materials and choosing to support those with transparent and sustainable supply chains. Ultimately, finding a balance between ethics, ecology and budget is key for many conscious students. It's about making informed choices that align with our values while also being mindful of our financial resources. By being conscious of the impact of our material choices, it is possible to support a more just and sustainable world.

[...] I studied the fabric a lot because I wanted it to be resistant to wear and tear, but at the same time have a rugged look. F27

The sweater in the photograph is made of polyester, nylon, wool and elastane. I thought the sweater was beautiful and suited my style. Of course, looking at the materials again, I see that the amount of wool, for example, is very small and that means that the sweater is not so warm, but, on the other hand, the sweater has other good qualities, such as being washable. F27

When it came to crafting or purchasing products, the *Conscious Students* often considered numerous factors before making their material choices. They spent time studying different fabrics to ensure that they were choosing the most suitable material for their craft or purchase. In the case of the sweater mentioned in the quote above (F27), the student found it beautiful and fitting for her style, even though it might not have been as warm as other sweaters due to the small amount of wool in it. However, she was aware of the issue. The *Conscious Students* also considered the environmental impact of the materials they chose. They often opted for eco-friendly or sustainable materials, such as organic cotton or recycled polyester, to reduce their carbon footprint. Overall, the *Conscious Students'* arguments for material choices were versatile and reflective, considering various factors such as durability, aesthetics and environmental impact. These arguments were consistent whether they were crafting a product or purchasing one.

When knitting and crocheting, I have compared different instructions to get an idea of which yarns are suitable for which types of work. I have discussed the properties of materials with friends and family. I

have visited different websites on the internet that give information about the properties of materials [...] I would like to learn more about the properties of materials so that I can consider different options in my own projects and product designs and be able to compare which material would be best suited to make a product. [...] I feel that knowledge of materials is an important skill in modern times, as there is an increasing desire to work in a sustainable way. F15

The *Conscious Students* used versatile information channels. They combined formal and informal (e.g. experiential) knowledge in their discourse. As shown in example F15, the students used informal knowledge channels to learn about the properties of different yarns and materials. This approach allows for a more experiential understanding of materials, which can be valuable in developing a deep understanding of their properties and how they can be used in different projects and product designs. In addition to informal channels, the students also sought information from formal sources, such as books and websites. This demonstrates a desire to access a variety of information channels and to learn from a range of perspectives. Moreover, the student in example F15 recognised the importance of having a knowledge of materials in modern times, particularly in the context of sustainability. With an increasing focus on environmental concerns and sustainable practices, an in-depth understanding of materials and their properties can help in making more informed decisions about materials for crafts and purchased products.

Conclusion and discussion

The purpose of this study was to explore the kinds of attitudes student teachers have towards materials in the contexts of crafting and consumption. This study was conducted by forming ideal types of students' attitudes. These ideal types help to better understand students' behaviour; the results can be valuable for developing craft teacher education and for future research. The data was based on 39 participants' attitudes regarding materials in the context of craft and consuming. The data was collected via semi-structured inquiries. The data was analysed using thematic analysis focusing on affective, conative and cognitive components. The findings of the study highlighted three different ideal types: (1) *Superficially Oriented*, (2) *Safely Mediocre* and (3) *Conscious*. Their differences and similarities are summarized and compared in the table below.

Table 2

Characteristics of the different ideal types

	Superficially Oriented	Safely Mediocre	Conscious
Material preferences (Affective component)	Materials matter little. A single property or material is mentioned.	Familiarity with the material or previous material experience is important especially when making crafts.	The material matters. There is a desire to influence ecology, ethics etc. through the material.
Material choices (Conative component)	The choice of material is not self-made or is based on chance, price, brand or aesthetics.	Workability or know-how of the material is emphasised when choosing the material. Availability of material and suitability for the purpose are important when choosing the material.	Arguments for material choices are versatile or reflective. Arguments are consistent in the context of crafts and purchased products.
Acquiring materials knowledge (Cognitive component)	Information gathering is not versatile. For example, Google or the Internet are often mentioned as the only channels for obtaining information.	The role of the school or home as a mediator of knowledge is obvious.	Versatile information channels are used. Formal and informal (e.g. experiential) knowledge is merged.

As can be seen in the table above, there is a risk that the *Superficially Oriented Students* do not have much interest in materials. However, it is important that students learn to understand the potential of thinking through materials (see Adamson, 2018; Nimkulrat, 2010, 2012), which supports embodied knowledge construction (see Groth, 2016; Groth & Mäkelä, 2016) or embodied experience (see Härkki, Seitamaa-Hakkarainen & Hakkarainen, 2016). Such students could benefit from pedagogical methods such as Material-Driven Design (Karana, Barati, Rognoli & Zeeuw van der Laan, 2015; Sørensen, Jagtap & Warell, 2017) or Material Tinkering (Parisi et al., 2017). Material-Driven Design is a method that focuses on integrating material knowledge with design learning. It emphasises the practical interaction with materials from the very beginning and encourages exploring and understanding the material's unique properties and limitations. This method could help in gaining an in-depth understanding of the material and its purpose in its context, emphasising experience rather than its structure. Using such methods could help students to develop a deeper appreciation for materials and their roles in different contexts.

Karana (2010) found that design students tend to avoid new materials. In this study, the *Safely Mediocre Students* expressed interest in new materials but ended up using familiar materials in both crafting and consuming. It is worth considering how to encourage the *Safely Mediocre Students* to experiment with materials with which they are not already familiar. By exploring the experiential properties of materials rather than defining the material requirements for product realisation (Sørensen, 2018), students could be encouraged to use different materials more boldly. Another possibility is to generate materials knowledge through material samples (Pedgley, 2014). It might be useful to develop a pedagogically meaningful 'library of materials' – a collection of material samples housed at the university – which would allow students to touch and feel material samples and make practical assessments of the materials' properties, which could inspire or influence material decisions for craft projects.

The *Conscious Students* expressed concerns about sustainability, covering a wide range of issues from the valorisation of waste to the naturalness of materials. They pointed out that they wanted to incorporate environmentally friendly materials that were biodegradable, renewable or recyclable. Sustainable craft is an important aspect of craft education, and craft is a powerful tool for understanding the material world (Väänänen, 2020). Furthermore, education should trigger students to try new materials, such as do-it-yourself materials, 3D printed materials and smart materials (see e.g. Bell et al., 2022; Dunne, 2018; Kääriäinen, Riutta, Tervinen & Vuorinen, 2020).

In conclusion, student teachers have varying attitudes towards materials prior to studying craft in their craft degree. There is a risk that some students may not be interested in materials, and this could hinder them in gaining a deeper understanding and appreciation for materials. These students would benefit from pedagogical methods, such as Material-Driven Design and Material Tinkering, that can help students gain a deeper understanding of materials and their purposes in different contexts. In addition, encouraging the *Safely Mediocre Students* to experiment with new materials through a materials library could be useful. Furthermore, sustainability is an important consideration, and students should be exposed to new eco-friendly materials, such as do-it-yourself materials, 3D printed materials and smart materials, to widen their knowledge and understanding of the materials' possibilities. Teaching about materials cannot be limited to lecturing. Ultimately, teaching and learning about materials requires a holistic approach that also takes into account the new materialism and, thereby, sustainable consumption.

Limitations and future studies

This study was based on a craft student teachers' assignment in their compulsory studies, so it has limitations in terms of generalisation. However, the written answers to the survey and the photographs attached to them supported each other: they gave a similar and presumably accurate picture of the students' material knowledge and use. The data was gathered in digital format and was ready for

analysis, but the students may have responded quickly and sloppily in order to complete the required assignment.

The data was acquired from students who had recently started their basic studies of craft science. As a result, the findings describe their knowledge of materials before such study. For further research, it would be interesting to collect data from the same students at a later stage. This would allow us to examine the impact of the training.

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