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Students immersing themselves in empathic design – A case study of Finnish 8th graders' crafting process

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Abstract

In this study, we explore the integration of user-centred and empathic design approaches within Finnish basic education craft studies, in which students engage in a holistic craft process, from ideation to planning, making and reflection. Data were collected from eighth-grade students and analysed using a multimodal approach to capture the varied ways in which the students expressed and developed their design thinking. The findings show that embedding empathy and user-oriented perspectives into the craft process enhances the meaningfulness and perceived relevance of the products to the students. These approaches also contribute to greater product longevity, as students design with real users' needs and emotional experiences in mind. However, the successful implementation of empathic and user-centred design requires sustained pedagogical support throughout all stages of the craft process. This study highlights the importance of teacher facilitation in helping students translate empathic insights into concrete design decisions, ultimately enriching both the learning experience and the quality of the final products.

Keywords

Empathic design, craft education, user-centred design

Introduction

Incorporating form into function, design responds to challenges that occur in day-to-day living through products, services and, on a broader scale, systemic user behaviour. Users and their needs, however, can differ widely, which calls on designers to consider adaptive user interfaces and embed social and cultural relevance and adaptivity into their design choices. This has been a topic of interest in the recent design research literature, especially within the perspective of integrating contextual, affective and emotional factors into creative design thinking (Li et al., 2024) Building on this perspective, design thinking provides a structured way to approach such complexity, functioning as an educational approach that fosters creativity, collaboration, and critical thinking by engaging learners in iterative, innovation-driven activities (Wrigley et al., 2018). By critically examining a problem to uncover its essential elements and identifying what most needs resolution, design thinking produces solutions that emphasise usability, feasibility, and well-justified aesthetic choices (Grönman et al., 2025).

On the part of designers, contextual factors in design include time constraints, available resources, cultural norms, standardised communication channels and attitudes towards users (Mattelmäki et al., 2014; van Rijn et al., 2005). Affective and emotional factors, on the

other hand, centre on a user's emotional experience and connection to a product in response to their emotions (Koskinen, 2003). Design practices that consider these factors often adopt a user-centred orientation, shaping products to meet the emotional and practical needs of their intended users (Mahadik et al., 2023). A well-known way to integrate these considerations within a design thinking framework is empathic design, which encourages designers to immerse themselves in users' lives, imagining their experiences with and emotional responses to products (Koskinen, 2003).

In schools, practicing empathy is embedded in emotional education (Altavilla et al., 2021; Schonert-Reichl, 2013; Silke et al., 2024; McNally et al., 2023). According to Jones and Bouffard (2012), emotional education includes cognitive regulation, various emotional processes and social and interpersonal skills. Students who participated in various social and emotional learning activities demonstrated substantially improved skills and academic achievement as well as improved attitudes towards school climate and safety, peer relationships and overall functioning (Cipriano et al., 2023). Furthermore, emotional education plays a crucial role in helping students develop emotional awareness, build meaningful relationships that navigate social interactions with sensitivity and understanding (Nanda et al., 2025). In the Finnish basic educational context, the goals of emotional education are included in the evaluative objectives of teaching and education as part of both subject-specific and broad-based competence goals (Finnish National Agency for Education [FNBE], 2014). According to FNBE (2014), students are given the opportunity to take responsibility for their own and shared work and develop their emotional and social skills. These skills support students' well-being and protect them from burnout (Salmela-Aro & Upadyaya, 2020).

Educational empathy can be explored at school from various perspectives and in various subjects. In arts and crafts, a design perspective involves collaboration, communication, creativity and critical thinking (Montero, 2023). Material understanding is acquired through engaging with the material, simultaneously evoking memories and creating new ones (Aktas & Groth, 2024). Providing the framework for this study, craft education encompasses ideas grounded in empathetic design and intended to promote responsiveness to the material world and compassion as well as a wider understanding of otherness, which are defined in the curriculum as skills for learning (FNBE 2014). In Finnish basic education, crafts is a mandatory art and practical subject, alongside visual arts, music, home economics and physical education, from Grades One to Seven, for students aged 7–14 (FNBE, 2014; also, Kouhia & Kokko, 2022). Today, contemporary craft education emphasises multi-materiality, which involves working with a diverse range of materials (Porko-Hudd et al., 2018). Through a holistic craft process that includes ideation, design and material selection, students learn to identify, use and maintain various materials while considering sustainable solutions aligned with the principles of circular economy (Härkönen et al., 2018; Kouhia & Kokko, 2022).

Recent studies on design learning and creativity have addressed the fact that motivation, empathy, ideation and prototyping are essential in developing innovation and problem-solving skills as well as design skills (Oo et al., 2025; Muneer et al., 2025). The view that teachers should be able to integrate technology into their instruction and thus support

learners' cognitive development has been widely discussed in the field of design learning (Rigopouli et al., 2025; Pino et al. 2025). In basic education, creativity, innovation and problem-solving skills are emphasised, and design thinking is one of the approaches used to support this. Research examining how secondary-school students develop their design thinking through empathic design at the primary- and secondary-education levels remains limited (Klapwijk & Van Doorn, 2015).

The primary aim of craft education is to engage learners in comprehensive craft processes, of which ideation and planning are integral. Nevertheless, current practice often emphasises the production of a finished artifact, thereby relegating the planning phase to a marginal role. For crafting to be truly meaningful, a robust and deliberate design component is essential. In this study, we aim to fill a persistent gap in design education research by examining how secondary-school students develop their design thinking through empathy in the design process. In this study, empathetic design is approached through a crafting process conducted in formal school learning, in which students were asked to develop a meaningful relationship with a product they ideate, design and ultimately manufacture and evaluate themselves, pondering their emotional gain due to the making process and responsibility for the quality, impact and usability of the design product. The aim of the study is to clarify the design process implemented in Finnish basic education in craft education and how students use empathetic design. Furthermore, the goal is to deepen our understanding of user issues, leading to new insights and innovation opportunities and engaging students in research before defining a design brief, resulting in less prescriptive outcomes. The present study was guided by two research questions (RQs):

RQ1. How does empathy support students' understanding of a meaningful product?

RQ2. In what ways does user-centred design assist students in designing products that have personal value for them?

Empathy in user-centred design

The concept of empathy was created by psychologist Edward B. Titchener as a translation of the German term 'Einfühlung', meaning 'feeling into' (Cherry, 2024). Empathy, as a concept, reflects the capacity to take one another person's point of view, understanding and experiencing the world from another perspective (Wright & McCarthy, 2008). While complete understanding may never be attained, one can approach others' views through agreement and compromise and by actively seeking to set aside one's own preconceptions and attempting to understand others' thoughts, needs and experiences through empathy (Cherry, 2024). Empathy can be divided into three categories: Affective empathy involves understanding others' emotions and responding to them appropriately, somatic empathy involves experiencing another person's emotions on a physical level and cognitive empathy involves understanding another person's thoughts and feelings (Weiland, 2023). By fostering empathy, we can better understand one another, allowing us to put ourselves in one another's shoes and respond appropriately in social situations (Cherry, 2024).

Empathy was incorporated into design through the development of methods that enabled designers to better understand and engage more closely with people's experiences when

creating successful products (Koskinen, 2003). In practice, designers no longer just anticipate users' needs—they become users themselves (Kouprie & Visser, 2009). From a psychological perspective, empathy represents a deeper level of understanding than mere knowledge. When placing oneself in another person's position, the designer must let go of their own preconceived attitudes and assumptions (Battarbee, 2003). Incorporating a personal element or experience into the design process strengthens the development of products intended for a specific user type (Mattelmäki et al., 2014). An empathic design process's success requires a great deal from the designer, both the ability to engage fully and a genuine sense of empathy (Kouprie & Visser, 2009; van Rijn et al., 2011).

To deepen the understanding of empathic design, Koskinen (2003) developed designers' radar (Figure 1). This is a conceptual model that maps the diverse methods designers employ. The model is multi-dimensional, incorporating the features of both designer-centred and user-centred approaches. Typically, design begins with design-centred approaches, which are broadened and enriched using imagined scenarios, enabling the designer to construct conceptual representations of user needs (*imagined*). As the process moves towards user-centred design approaches, designers begin to incorporate insights derived from user studies and statistical analyses by systematically exploring alternative design solutions and subjecting them to iterative testing (*represented*). This shift often involves empirical research being applied at various stages of the design process. At the end of user-centred design, the designer seeks to understand the user by immersing themselves in their world. This experienced level can be achieved through methods such as ethnographic research, direct participation in users' daily lives or observation within the user's context.

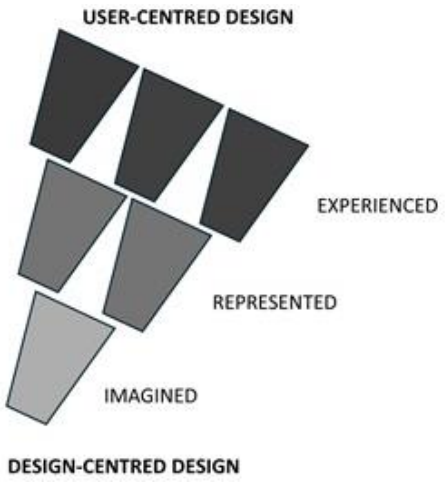


Figure 1. Designers' radar (Koskinen, 2003), concepts reinterpreted by the authors

As Koskinen (2003) emphasised, empathic understanding serves as the foundation for design decisions, rather designers relying solely on data. User-centred design is a methodology that prioritises user needs, employing an iterative process to ensure their requirements are addressed at every stage. This approach naturally incorporates real users, frequently in the settings in which they would interact with the product, and it has evolved within user-centred design, making users an integral part of the development process. The three user

types are those who directly use the artefact; secondary users, who use it occasionally or through intermediaries, and tertiary users, who are affected by its use or involved in decisions regarding its purchase. Effective product design must consider all stakeholders, even those directly in the design team (Abras et al., 2004).

Although user-centred research is widely used in design practice, it is not yet commonly included in undergraduate design programs. The use of toolkits such as IDEO's Field Guide to Human-Centred Design is becoming increasingly common, offering students various observational and participatory methods to gather user insights, which are valuable in the early design stages (Spruce & Evans, 2020). A study by Spruce and Evans (2020) suggests that adopting user-centred methods in project-based learning can enhance design skills and transform mindsets by challenging students' existing perspectives. This approach fosters high-level learning, encompassing analytical, critical and reflective abilities, which are highly valuable in design and professional practice. The Transforming Learning Framework enables students to develop new user-centred perspectives that influence both their design processes and their understanding of design (Spruce & Evans, 2020).

User-centred product design methods address users' emotions and experiences with the product, fostering an empathetic connection between users and the product (Dam & Teo, 2024). To understand a product's usability, one must observe its use or use another objective data source. In contrast, to understand the reflective nature of products, one must understand people's experiences with the products; thus, one requires an empathetic understanding of users (Koskinen, 2003). Rather than attempting to imagine what another person is thinking, utilising empathy goes much deeper. By attempting to place ourselves in the other person's position, we identify with their thoughts and feelings, which increases our appreciation for them and allows us to adopt various perspectives (Demetriou & Nicholl, 2021).

Crafts as a place for students' empathetic design

The significance of making crafts is broad, with both the product and the process of making being important. The value of craft products has evolved, particularly due to industrialisation and mass production (Kouhia 2016). As a result, the focus of crafting artefacts has shifted from the ready-made to self-expression and self-fulfilment (Pöllänen et al., 2000). It seems that crafted products have greater value for both the maker and the user than mass-produced items. Personal investment is embedded in the creation process, as are the emotional and cultural connections that such products foster (Luutonen, 2009). Furthermore, crafted products often carry narratives of identity, tradition and intentionality, which contribute to their perceived worth and meaningfulness (Costin, 1998; Kouhia 2012), carrying memories of specific moments, life stages and relationships as well as feelings of love and respect (Dittmar, 1992; Visser, 1994). According to Koskinen and Battarbee (2005), when products are connected to oneself, close family, relatives and friends, their spiritual significance grows. Some objects convey memories and associations, while others derive meaning from personal experiences, intrinsic qualities, style and practical features. This idea is used in both user-centred and empathetic design.

The focus of Finnish crafts education is a holistic craft process, which includes ideation, the product and making process, manufacturing and reflection (FNBE, 2014). Students are taught the production of items that encompass both textile and technical crafts (Härkki et al., 2023). The design process is considered a significant part of the overall craft process (Kokko et al, 2014). According to Bosch's study, incorporating empathy into students' product design processes increases their awareness of people's lives and needs, thereby adding value to both the design process and the final product (Bosch et al., 2022).

Hasselskog's (2010) study of Swedish craft education found that students expect to design and create products for their own use during craft lessons. The products made in school craft lessons should be relevant to the lives of children and young people (Rönkkö & Aerila, 2024). This connection may stem from a learner's personal environment, hobbies or aspirations. The future of crafts can be imagined by drawing on their long history, their traditions and changes in their various roles. Therefore, engaging in crafts and the subject of crafts in education should create meaningful experiences for students so that they understand the importance of crafting for their well-being and future. Can we learn from the design of meaningful products in industry? User-centred design and empathic design result in meaningful products.

Method

Participants and procedure

The data for this study were collected from a primary school located in Northern Finland over a period of 9 months (September 2024 to May 2025). The study included a total of 11 students, of whom one joined during the study process and eight participated in the interviews. All were 8th graders (aged 14 to 15), who had chosen crafts as an elective subject. In August 2024, official research permission was obtained from the school principal. At the end of August 2024, the participants and their guardians were informed of the study. Participation was voluntary, with informed consent being obtained from all students and their parents/guardians. The participants were free to withdraw from the study at any time, and no justification for refusal was required.

The crafting activity was planned in accordance with the curriculum, and all participants were required to complete the assignments. However, the material collected by that point could still be used despite the withdrawal (Kuula-Luumi, 2020). The students' anonymity was ensured by sequential XO codes based on running numbers. Ethical procedures were conducted in accordance with the Finnish National Board on Research Integrity (TENK, 2023), which addresses informed consent, necessary permits and data protection and confidentiality.

Table 1 outlines the progression of the process by systematically examining each phase and presenting the types of data generated during each phase.

Table 1. The process phases and activities

Crafting phase	Activity	Data	Analysis

Orientation phase	Writing based on the title *Treasured Item*	Essays (n = 10)	Multi-modal analysis
Ideation phase	*Writing or drawing based on the title A Day in the Life of X*	Essays (n = 10), a drawing (n = 1)	
Design phase	Designing the carrying case/bag and making the surface pattern for the bag	Sketches for bags (n = 11) and designs for surface patterns (n = 16)	
Production phase	Making of the bag and cutting the pattern	No data obtained	
Reflection phase	Reflection implemented in the classroom	Group interviews (n = 3), pictures of ready-made carrying case (n = 10)	

The students had prior experience in designing and making crafted items, yet they had not employed empathetic design in their craft processes. The orientation phase began with a researcher visiting the class to introduce the orientation phase task. She discussed meaningful objecthood while also showing them her own essential items, such as an old book from her childhood and crafted items made by her child. For the first essay assignment, 'Treasured Item: A Personal Reflection', the students were assigned the task of writing an essay about their own meaningful items in reference to the guiding questions provided by the researcher. The treasured item could extend to artefacts and natural objects; only phones and gaming devices were prohibited. For essay writing, the students used a digital learning environment, in which they could also attach pictures. Students were given two weeks to submit their essays.

In the second phase of data collection, focusing on ideation, the students were assigned the task of immersing themselves in the life of a chosen person for one day, making observations about the day and considering what kinds of items the person could need daily. The second essay assignment, entitled 'A Day in the Life of X', could be submitted in a written, drawn or combined format. The students had one week to complete the task.

The third phase was a design phase, in which the students were tasked with designing a carrying case or bag for a specific person chosen by the student, according to teacher's annual plan. They were instructed to draw inspiration from both previous assignments. In the design task, the bag format was restricted to simple, feasible carrying cases, with at least one mandatory design feature produced with an electronic cutter. Students were provided with a design template that included questions about the bag's design process, such as the intended use, strap length and number of pockets. The template also included space in which to draw the bag from both the front and back. The students could determine the size of the bag themselves as well as the number, width and length of the handles and any potential details, such as pockets, straps and buttons. Furthermore, during the design phase, the students were asked to design the surface pattern for the bag using either iron-on paper or a fabric printing stencil. Both methods included a design prompt to use an electronic

cutter, which was a new device for the students. The researcher who participated in their class introduced the electronic cutter and taught the students how to design using it and how to use it. To support their technical design, the students were provided with an array of ready-made bags, from which they took measurements and which they tested in practice.

During the production phase, the students sewed the bags according to their own technical and aesthetic designs. Each of them had made their own material and color choices regarding fabric and iron-on paper. During this phase, they also made fabric printings or iron-on transfers. The entire crafting process, including ideation, essay writing, design and bag production, lasted almost the entire spring semester. The students also had other parallel projects to complete at the same time as they were completing the bag project, but this task was their main evaluative work for the spring semester. The bag process was a time-consuming learning task, for example, due to challenges related to digital design constraints, such as access to only one electronic cutter in the classroom and image editing with iPad applications.

The final phase was the reflection phase, which was implemented via group interviewing. The students were divided into three interview groups (one to three students each), as they came from three separate classes. The final reflection phase was conducted. This elective crafts course consisted of students from three parallel classes, so the students were interviewed in groups with their classmates. The interview questions were prepared in advance and were the same for everyone. The students answered eight questions about the process of crafting.

Data analysis

In this study, the output produced by ten students was analysed using theory-driven multi-modal analysis. According to Kress and van Leeuwen (2005), multimodality refers to a text that utilises and interprets several modes, as multimodal texts are interpretations of responses formed from various sources. Snell-Hornby's (2006) definition of multimodality includes both verbal and non-verbal materials that are part of visual and auditory perception. In contrast to traditional unimodal methods of analysis, multimodality enables a deeper and broader understanding of the data by combining various sources of information (Mills & Unsworth, 2017). Drawings and cartoons are good examples of multimodal narratives, and their correct interpretation depends on the integration of various semiotic resources (Baldry & Thibault, 2006). The analysis of a student's craft process was multimodal: The various aspects of the process included essays, photographs, sketches and interviews.

The analytical process comprised several interrelated stages, including diverse data collection methods, feature extraction and integration, modelling and interpretation. Each segment of the dataset underwent an iterative thematic analysis to identify both recurring and distinctive features. This multi-layered approach enabled a comprehensive understanding of the multimodal elements in the students' work and facilitated the identification of patterns relevant to the research objectives (Guerrero-Sosa et al., 2025). After analysing this multimodal data, we answered our research questions using a step-by-step approach. All written and visual data were read through, and the first author coded and

thematised the data. Together with the second and third authors, discussions were held, and each student's outputs were reviewed, with differing potential interpretations being considered and debated.

To address the first research question (How does empathy support students' understanding of a meaningful product?), the analysis focused on the first two written tasks produced by the students. The second essay task encouraged the students to adopt another person's perspective and reflect on objects that may hold personal significance for that individual. This empathetic engagement enabled the students to deepen their understanding of the emotional and symbolic value of everyday items. Two themes emerged from the data (*motivation derived from personal experiences and memories, and imagined user perspectives as the starting point of the design process)*, which served as the basis for examining how empathy supported the students' design processes. In response to the second research question (In what ways does user-centred design assist students in designing products that have personal value for them?), the data consisted of students' design plans for a bag and a pattern, as well as interview transcripts. The themes (*finding relevance in empathetic design and crafting a personal product*) were used to examine how empathetic design was reflected in the students' crafted items. The students' original expressions are supported in the results by sketches, photographs and texts that have been translated into English for the article.

Findings

RQ1. How does empathy support students' understanding of a meaningful product?

Motivation through personal experiences and memories

Regarding the first research question, the findings indicated that emotions and memories contribute to the understanding of meaningful products. Emotions are evoked by recalling personal experiences and bringing forth the emotions and memories associated with products. The first task encouraged students to think about the significance of emotions and attachment and why particular objects might become meaningful to people, even to the extent that the objects might be considered worth keeping, including maintenance and repair, despite the fact that they may not have high monetary value. For students, focusing on their own meaningful objects and reflecting on the feelings associated with them also served as a motivator for the task. In the essays, the students expressed emotions about their chosen objects, sharing personal stories and memories associated with them and highlighting their sentimental value. During the task, pictures that accompanied the essays helped visually convey students' relationships and attachments in terms of the perceived meaningfulness of the objects. Many of the students' meaningful objects displayed in the task had been received in childhood and accompanied them throughout their lives. Interestingly, the meaningful objects used in the task comprised several objects that can be regarded as soft toys, some of which had already become worn out or even broken down, as they had been loved and taken care of over the years.

One story about a significant soft toy (Figure 2) revealed how such objects had provided comfort and a sense of security, especially during challenging times. The story stated that the toy had been given to the student by her father some years ago, and the fact that the donor was the student's father had a striking consequence regarding the perceived

meaningfulness. The associated story detailed how whenever a fear of losing loved ones arose, the stuffed toy represented its giver, offering the student a sense of comfort and the feeling that if anything ever happened to their father, his memory would remain tangible in the form of the object. At home, the student had positioned the soft toy in a small box on the shelf, where they hoped it would remain intact; during this task, the toy was unboxed, and its perceived significance was brought to life. All in all, this story shows how meaningful objects can be regarded as having high symbolic value and the potential to preserve connections between perceived meaningfulness and design.

Figure 2. A soft toy given by a student's father (xo1)

Practical and active care-taking practices were also reflected in the students' stories. These stories addressed how the students valued their meaningful objects by performing cautious and considerate caretaking, for example, choosing specific places to store the items, such as the special box on a shelf mentioned in the excerpt on the stuffed animal toy, to ensure that the meaningful objects remained clean, safe and well preserved. Other stories mentioned the joy and happiness provided by meaningful objects, and the students recalling specific moments from their childhoods, as portrayed in one essay's narrative:

> *This jewelry box is important to me because I have had it throughout my childhood and it contains irreplaceable things. I'm not sure when I got it, but I've had it for a long time. And I received it as a gift. I still use the jewelry box for its original intended purpose. This jewelry box has a mechanism that produces music. When I was a child, I listened to the music; it played a lot, and nowadays, when I hear it, many memories of my childhood home arise, which further emphasises the importance of the box. (xo5)*

Figure 3. A jewelry box (xo5)

This object (Figure 3) elicited a multisensory emotional response in the student; by listening to the music produced by the jewelry box and exploring its contents, they could reconnect with feelings and experiences from their childhood.

Imagined user perspectives as a starting point for the design process

In the ideation phase of the 'A Day in the Life of X' assignment, the students immersed themselves in the life of a chosen person for a day. The task facilitated students' comprehension of another individual's life circumstances and needs by promoting empathetic engagement and perspective-taking through immersion in everyday experiences. By putting themselves in another person's shoes, the students learned to see the world from different viewpoints; considering the items that the chosen person might need on their day made the students more aware of the practical aspects of daily life and how different people might prioritise different things.

> *Pinja [Imagined person] ties her hair back and puts on casual daywear. Next, she heads downstairs to her home office and begins editing a YouTube video and a podcast episode. After a few hours, she receives a PR package at home—an invitation to a group fitness boxing event, along with energy drinks and boxing gloves. Pinja enjoys working out in the evenings, so she heads to the gym. After a couple of hours of training, she returns home to get ready. At home, she does her hair, changes into more polished clothes, and applies makeup. (xo4)*

By comparing their own daily routines and needs with those of the imagined people, the students could reflect on their own lives and the things they might take for granted. The stories often featured individuals who appeared to be closely connected to the students' own lifeworld. In these narratives, the characters engage in everyday activities, such as waking up, eating and spending time with family. The stories progressed from morning routines to being at school, followed by various afternoon activities, such as engaging in hobbies; socialising with friends; playing on various gaming consoles and, finally, sharing family time and evening routines. Through this task, the students developed the ability to systematically analyse and differentiate user actions and needs as they are experienced in context, thereby fostering a deep understanding of user-centred design principles.

RQ2: In what ways does user-centred design assist students in designing products that have personal value for them?

Finding relevance in empathetic design

The study demonstrated that when the students engaged with their products through essay writing, they were able to envision novel uses for them and concentrate on the specific characteristics the products had to possess. Through empathy, the students practiced envisioning potential users, their needs and their experiences and managed to consider various users and user groups. However, the user-centred approach proved to be demanding for novice designers, and many ultimately chose conventional design solutions and user approaches for their craft products and designed and made craft products for themselves.

For a novice designer, the path from plan to implementation seemed quite straightforward. However, the goal of ideation and design was generating alternatives and reflecting on them. A design template seemed to support designing with the help of questions, although it was surprising that the students settled for their first ideas and designs. The students completed several assignments designed to support their ideation and design process, but despite this, they did not perceive various perspectives and produce diverse sketches for craft products. As the aim was to steer the process towards user-centred design, it was necessary to consider, for example, the size of the pockets, the size and shape of the bag, the length of the straps and the details regarding the bag that the intended user needs. It was easy for them to consider simple technical solutions and vary them, as shown in Figure 4. As seen in that figure, a student had designed a bag for herself, which was intended to carry her own art supplies. Due to the use of context, the shoulder straps had been lengthened, a pocket had been added, and patterns had been placed on both sides of the bag. All these alterations can be considered as conventional modifications of the bag's purpose, shape and or features (e.g., the needs arising from the situation of use were left unaddressed). These solutions mainly concerned the surface of the bag and did not significantly alter its shape.

Crafting a personal product

The students' task was to design a product for a specific use context. Designing and attaching patterns for iron-on transfers transformed the bags, which all began at the same starting point, into personalised, meaningful products. The electronic cutting pattern personalised the bags. For their designs, the students chose empowering slogans; typical nature-inspired ideas, such as flowers, as well as patterns reflecting current fashion trends. The patterning clearly added additional meaning to the work, as the product itself was very simple. These personalised design features seemed to sustain the perceived meaningfulness of the products. For example, xo7 notes how meaningful a product becomes when one designs it specifically for oneself and one's own needs. In Figure 4, there are two designs, both involving a power phrase, one of which refers to a book-related hobby and the other of which is, perhaps, a more appealing expression.

> *When you know you are making something for yourself, you pay more attention to the design of the patterns; they become personal and truly reflect your own preferences. (xo7)*

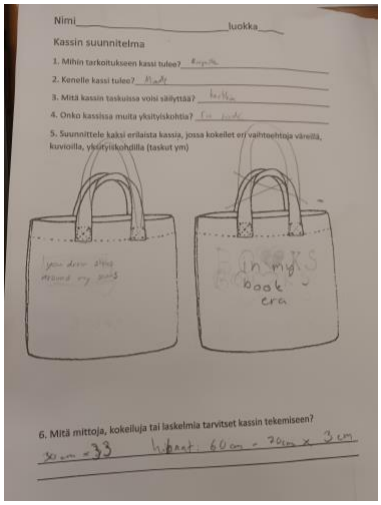
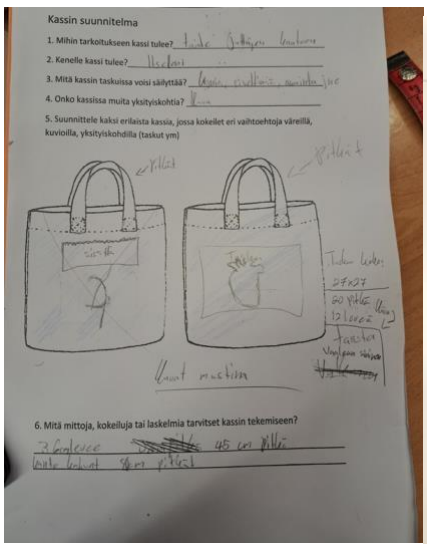


Figure 4. Students' design paper (xo7)

In Figure 5, we see a student's design paper. The student envisioned a bag tailored to her own use, specifically carrying her personal art supplies. Both sides of the bag feature carefully planned iron-transfer images, and inside, the student has added a thoughtfully placed pocket for organising tools. The central visual element is an artistically rendered human heart drawn with anatomical detail, rather than a simple symbolic heart shape. This choice gives the design a raw, expressive quality and reveals how deeply the student connects with her artistic hobby, something that is truly close to her heart in both literal and metaphorical senses. On the paper, the student has also sketched out precise measurements, specifically the overall size of the bag and the length of the shoulder straps, demonstrating attention to not only aesthetics but also practical usability.



Figures 5, 6 and 7. The design paper for the bag and completed bag, pictured on both sides (xo5)

Figures 6 and 7 show the student's completed bag. Both sides feature a heart motif, but the student has used the iron-transfer material in an inventive way: On one side, the heart is created with the transfer material itself, while on the other side, the heart-shaped area has been left as plain fabric, and the surrounding area is made with the transfer material, resulting in a negative version of the motif on the opposite side. This design shows perseverance in terms of considering design options in sketch planning, persistence in the craft process with considered and detailed motive composition and purposefulness regarding the material choices for the bag.

Discussion

Integrating empathy into the ideation and design phases of students' craft processes led to products that were distinctly personalised, deeply meaningful and reflective of individual identity. Student design work is typically characterised by a highly linear approach, in which the first idea is accepted without further development. However, the purpose of ideation is to generate diverse ideas and resolutions to a design task, which can then be refined during the design phase. Integrating empathy into user-centred design assists students in immersing themselves in the user's perspective, thus evoking a wide range of solutions and alternatives.

Our research brought a new perspective, not only to craft education but also to the learning of emotional education skills, which is also part of the broad curriculum objectives in Finland. The study emphasised the importance of integrating empathy and user-centred design into education to create meaningful, sustainable crafted products. This study highlighted the fact that if a student knows for whom a product is designed, the product may become more meaningful for the maker. This is in line with Bosch et al.'s (2022) research findings (see also van Rijn et al., 2011) highlighting the fact that students' own experiences of context are among the most essential sources of intrinsic motivation for both the design process and production. However, Bosch et al. (2022) emphasises the difficulty of measuring or analysing empathy in research. In this study, the data were multimodal and included narrative, images and interviews to capture empathy in all the design phases. Although the design process is a dialogic one between teachers and students (see also Bosch et al., 2022), this study focused on students' written and visual outputs.

The results indicate that crafted products can be seen as personalised because they are always made by someone, and the creator's personality influences the user's experience (see Visser, 1994). This is evident, for instance, when a handmade item is given as a gift, where it is thought to reflect aspects of the giver and maker or the shared values of the giver and recipient (Hickey, 1997; Xiaoming et al., 2024). Items made by close friends or family members are identified as especially meaningful to recipients, regardless of the maker's skill level, as the qualities of the person behind the object can be more important than the object itself (Luutonen, 2007). What makes an object significant is not its beauty, practicality or monetary worth but, rather, the context in which it was received or acquired (Csikszentmihalyi & Rochberg-Halton, 1995). It can thus be said that craft objects seem to hold value not only for their functionality but also for their close connection to personal life.

Critical thinking skills and their significance in today's consumer society are substantial, and these skills have a long-lasting impact. The choices students make and the original solutions they develop strengthen their self-esteem, which is one of the key objectives of craft education (FNBE, 2014). One significant finding of this study is that designing and producing a product that is meaningful for students may also generate long-lasting product relations and thus contribute to sustainability. Sustainability is an important goal for learning in school, and it is mentioned as one of the core targets of transversal competences as defined by the Finnish National Board of Education (FNBE), and therefore, this kind of empathy-related task may have an important role in the future of craft education.

Conclusions

Most students participating in the study demonstrated limited persistence in terms of completing the process, from its initial stages to its conclusion. This task was not demanding in terms of structure or materials but, rather, in terms of time. In addition, the previous experience that students had in product design primarily involved executing pre-designed, predetermined tasks, which made this type of open-ended process unfamiliar and challenging. This type of open-ended empathy task was considered demanding. Nevertheless, the final products proved to be meaningful for and personalised to the students. Although the curriculum emphasises these factors, completing such a comprehensive process requires substantial teacher support at every stage. This suggests that greater attention should be devoted to this issue during teacher education, even though the holistic craft process has long been included in crafts education.

As novice designers, students require strong teacher support throughout the entire design process. Koskinen's (2003) model promotes empathetic design, which can be adapted for use in basic education in a simplified form. In its original form, the model is intended for professional designers, whereas students, as novices, require continuous guidance and explicit clarification at every stage. Both students and pre-service teachers must practice the various phases of empathetic design. This conclusion is also supported by Rönkkö et al. (2016), who state that design is an integral part of students' holistic craft process. Given the results, we require more research on how to make product design more meaningful for students so that they can design and create products with the widest and longest possible usage. Focusing on empathy could also improve students' understanding of and attitudes towards other people's perspectives and the various ways of being human.

Limitations

The size of this case was limited, but it provided significant information for primary and for secondary education. This study was preceded by a pilot study in which a comparable assignment was carried out with third-grade pupils. The pilot study informed and supported the design of the main study; however, it was not conducted with the same scope or level of methodological systematicity. To enhance the study's reliability, we have meticulously described the data collection process and included images and excerpts from the students' assignments to support our interpretations.

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