Learning craft skills: exploring preschoolers' craft-making process

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Abstract

The aim of this study was to explore a preschooler craft-making process in which 18 preschool novices cut pieces for fabric bags and designed and printed patterns to decorate the bags. Through the task, children were familiarised with a small-scale holistic craft process. The intention was to determine how preschoolers perceived, verbalised and interpreted the craft-making process and how children used bodily expressions when explaining a learned craft skill. The present study relies on the videographic method: two preschool groups' stamp printing activities were recorded, and each child was interviewed individually. Children's embodied expressions were particularly in focus in video analysis. The results reveal that all the children were able to sufficiently explain the making phase, however, some children compensated for missing words using bodily and facial expressions and gestures when talking about making. The results showed that children worked logically, and the skill learning phases of perceiving, making, and interpretation were revealed from their learning.

Key words

Preschoolers, craft making process, verbalisation, embodiment, holistic craft

Introduction

The recently launched Finnish National core curriculum reform for pre-primary and comprehensive school levels will be implemented in 2016 (Opetushallitus, 2014). The aims of the pre-primary education curricula are connected more closely to basic education, targeted to form a consistently progressive entity as well as a foundation for growth and lifelong learning (Esiopetuksen opetussuunnitelman perusteet, 2014, p. 12). Despite the harmonisation of curricula, pre-primary education remains part of early childhood education for children six to seven years old. Child-centred teaching approaches, learning through play, and instilling a passion for learning are the general objectives of pre-primary education (NCCPE, 2010). Pre-primary education consists of five different broad areas: expression, language, community, environment, and growth and development. Handicrafts belong to the area of expression, aiming to provide children holistic experiences of craft processes. The holistic craft process consists of designing, making, and evaluating phases (Pöllänen, 2009), and it emphasises children's own senses, perceptions, and experiences (EOPS, 2014, p. 31). In handicraft the designing and making are both multi-modal processes that require problem solving processes as well as hand, mind and eye coordination. However, there is a lack of research related to the study of preschoolers' craft learning. This article seeks to contribute to the research on the educational values of early childhood education and craft learning by focusing on children's multi-modal and embodied aspects of handicrafts. The focus of the present study was to analyse preschoolers' craft-making process, especially the embodiment of the preschoolers' craft learning. Young children's craft making involves embodied knowledge that is expressed through gestures and facial expressions. In this article, we focus on the children's verbal and non-verbal descriptions of previously learned craft skills. Studies that focus on young children's craft making and embodied knowledge are rare.

Essentially, craft making is seen as a creative process that requires the transformation of visual ideas into material forms (Kangas, Seitamaa-Hakkarainen, Hakkarainen, 2013). To learn new craft skills, students need to experiment, handle, and think using materials and tools. Preschool-aged children are active and interested in everything; they have a desire to explore and learn about different things. They learn by experimenting, and they express their feelings bodily. Fredriksen (2011) explored the kinds of processes that occur when children three to five years old handle tangible materials, emphasising the multimodality in their meaning making: how different forms of communication (language, bodily expression, and the use of tangible materials) simultaneously complement each other. When describing their activities, children often compensate for missing words using bodily and facial expressions and gestures (Fredriksen, 2011).

As stated previously, the concept of holistic crafts refers to designing and making processes in which one works through all phases of the craft process, generating and developing design ideas (i.e. designing phase), making crafts, and evaluating the entire craft process individually or as a group (Pöllänen, 2009). In the designing phase, the students become familiar with the given task and generate design ideas, focusing first on the outline and then on the designing of details. During the making phase, the students implement their designs, although their planned visual and technical ideas are subject to continuous evaluation and problem-solving throughout the craft process (Kangas et al., 2013). The evaluation phase is based on students' self-reflection, conceptualisation, and ability to talk about actual making. It is crucial that all these phases be undertaken in young children's craft activities, although it is evident that young children need more help from adults (Yliverronen, 2014). Rönkkö & Aerila (2015) emphasised the importance of supporting small children in learning to express their own thoughts and narratives in regard to crafts, allowing the children to practice language skills and articulation.

Preschool children are encouraged to design and make a variety of crafts using their own skills and imagination as well as to work together with others (EOPS, 2014, p. 32). Various aspects of the holistic craft processes can be emphasised in different ways in different tasks. For example, the design task can emphasise children's imagination or place more emphasis on a particular manual skill or technique. In this article, we will focus on the making phase and learning of basic craft skills (i.e. cutting fabric, stamp printing, ironing) as these children were preschool novices and had very little experience in craft making. The focus of this study is on the children's verbal and non-verbal descriptions of the previously learned craft skill. We addressed the following research questions:

1. How do preschoolers perceive the craft-making process?
2. How do they verbalise and interpret their craft-making process?
3. In what ways is embodiment present in preschoolers' craft-making process and explanations of new craft skills?

Skill learning and embodiment

The development of skills can be considered as a problem solving process. Craft skills consist of fine motor, technical, and cognitive skills such as perception and problem-solving. Craft skills are not just a series of operations; they represent know-how combined with knowledge and thinking: the craft maker has to know what to do, how to do it, and why. According to Sawyer (2006), deep learning requires six key elements. Syrjäläinen and Haverinen (2012) have applied these elements, and explained skill learning as a process consisting of three phases—perception, practice, and interpretation. All three phases are vital in the craft-learning process (Syrjäläinen & Haverinen, 2012).

However, empirical studies that combine the study of preschoolers' craft learning processes in relation cognitive and embodied aspects are still extremely rare.

In the area of art education, Räsänen (1999) has developed a model of experiential art interpretation on the basis of Kolb's (1984) experiential learning model. Räsänen sees art learning as a triangle, where an experience is processed through reflection, conceptualisation, and production. In her model, the learner's direct experiences, reflective observation, abstract conceptualisation, and active experimentation take turns in a spiral-like movement (Räsänen, 1999). The model emphasises the learner's own reflection; that is, learning takes place when the learner processes his or her experience and transforms it into action (Räsänen, 1999). Also, Rönkkö and Aerila (2015) have applied Kolb's model to preschoolers' craft education, emphasising children's narrations. In an earlier study, Aerila and Rönkkö (2013) used storytelling to motivate preschoolers' craft-making process. Virta et al. (2013) studied five and six year old children's awareness of a craft process. Children's craft sense was supported with a series of pictures, which based on the phases of a holistic craft process. It was found that pictures made the learning event more concrete for the children.

We have been influenced by the models Syrjäläinen and Haverinen (2012) and Räsänen (1999) used to describe embodied craft-learning processes. From Syrjäläinen and Haverinen (2012), we have quoted the three phases of the skill-learning process: perceiving, making, and interpretation. From Räsänen (1999) we have adapted the experimental character of the skill-learning process. We presume, these aspects are often 'embodimentally' interwoven in young children's learning. *Perceiving* is important to activate cognitive processes toward the task as well as to activate design thinking and ideation. Furthermore, perceiving orientates children toward actual making, that is, how to implement the design idea. Usually, in craft education perceiving phase is preceded by a teaching session, where various elements of the task, opportunities, and constraints of the task are explained by the teacher. These teaching sessions are usually demonstrations in which the teacher shows and models a specific craft-working method (for example, holding scissors and cutting fabric or showing simple stitches). These teaching methods are based on verbal scaffolding (explaining and concretising) as well as observation of performance (modelling).

Making is the stage of concrete operations and performance of the task, and it is here where the created images will take a concrete form (Patel, 2008). The students evaluate their own performances, searching for new alternatives or working strategies. They can work forward or return back to carry out the previous phase differently. The *interpretation* stage gives students the opportunity to articulate their own designs and making processes as well as to discuss various themes (e.g. friendship) on the basis of their own products (Rönkkö & Aerila, 2015). While conceptualising these processes, the students need to organise their thinking so that previously abstract images will form an understandable and logical narrative of their own processes. According to Sawyer (2006), the best learning takes place when learners articulate their unfinished and developing thinking process and continue the articulation throughout the whole process. Articulating and learning go hand in hand: when thinking aloud, learning is more rapid and deep than when studying quietly (Sawyer, 2006).

Craft skills require good coordination of the eye, hands, and thinking. In the thinking and learning processes, perception, action, and cognition are tightly interwoven (Koning & Tabbers, 2011). Patel (2008) has developed the concept of *embodied thinking* to describe how bodies, the handling of tools and materials, and actions in space are interconnected in artisans' thinking processes. Embodied thinking is relational and dynamic, mediated by the tools used and grounded in sensorimotor activity. Embodiment is seen as a fundamental way of acquiring information and perceiving one's environment; it involves perceiving and gathering information, organising perceived actions (i.e. procedures), and concentrating on actions while making. This kind of embodied thinking is visible, especially in gestures.

There is an increasing amount of research on embodiment in the learning sciences (Hall & Nemirovsky, 2012). Embodiment has been studied in various work and learning settings (for review, see Streeck, Goodwin, & LeBaron, 2011), for example, in mathematics education (Alibali & Nathan, 2012). The recent studies on mathematics learning provide strong evidence that cognition is grounded in action, and that there is a robust link between action and understanding (Hall & Nemirovsky, 2012; Alibali & Nathan, 2012). In addition to facilitating problem-solving and communication, gestures indicate the sensorimotor simulation involved in thinking processes (Hall & Nemirovsky, 2012; see also Alibali and Nathan, 2012). In craft education, the interaction between teachers and students through bodily instructions and explanations has been a focus of investigation (Ekström, Lindwall, & Säljö, 2009; Ekström, 2012). Communication and learning through non-verbal interaction (Illum, 2006; Illum & Johansson, 2009) has been studied as well as verbal and non-verbal activities and actions in craft (sloyd) and design lessons (Johansson, 2006). Our previous study (Koskinen, Seitamaa-Hakkarainen, & Hakkarainen, 2015) described the embodied interaction between the teacher and students in a textile class, and we analysed how the physical materials and tools mediated the appropriation of craft knowledge. To learn new craft skills, students need to experiment, handle, and think using materials and tools (Kangas et al., 2014). In this study, we focus on children's verbal and non-verbal descriptions of previously learned craft skills. In the following, we describe the participants and the context of the data, the method of collection, and the data analysis.

Method

The present study took place in a public kindergarten preschool situated in western Finland. Children participated in an experiment in which craft education was carried out weekly as a part of preschool education. A total of 18 children (nine girls and nine boys) with an average age of six years took part in the study. The group was divided into two smaller groups, which normally worked with a kindergarten teacher and an assistant. During the craft sessions, one of the authors was guiding craft activities.

The bag theme, which is presented here, consisted of three sessions. The aim of the craft activities was to make small fabric bags, decorated with stamp printing. The bag project can be considered to represent a small-scale holistic craft processes by consisting of ideation of fabric bag's surface, cutting the fabric and actual printing. However, the actual sewing of the bag was made by the adults, because it was considered to be too difficult for six years old children. Since the children had started preschool three weeks earlier, this craft activity was the first for several children. Thus, the technical production was designed to be as simple as possible. The task offered an experience of a new working method and materials in the context of a small-scale craft process and taught children to act according to verbal instructions.

During the first working session, children were tasked to work in pairs, cutting fabric pieces for their bags with the help of cardboard patterns. In the second session one week later, children printed figures with ready-made wooden stamps (different shapes) on their bags. At the beginning of the second session, children were given their previously sewn bags, and they were guided verbally and with demonstrations, for example, about the stamp printing technique, fabric colours, and steps in the making process. They were encouraged to invent their own patterns, but the designing was not specially guided. Finally, after one week, children finished by ironing their bags.

The craft unit of our study was carefully designed following Huovila and Rautio's (2011) model for structuring craft sessions. Table 1 represents the bag theme's objectives and targets of evaluation in four blocks. The objectives of craft education were grouped into four sections from pupils' perspectives: 1) objectives for craft knowledge and basic skills, 2) objectives for design, 3) objectives

for working skills, 4) general educational and/or growth-related objectives. In the present study, we emphasised the objectives of learning craft knowledge and basic skills.

Table 1.

The Objectives and Evaluation of the Bag Theme Adapted from Huovila & Rautio (2011, 135).

	Objectives	**Objectives**	
Evaluation	Craft knowledge and basic skills making stamp printing using scissors ironing	Design competence well-balanced composition	**Evaluation**
Evaluation	Working skills observing and evaluating own activities (ability to describe the main stages of the making process) ability to work with verbal instructions working carefully (work safety)	Educational/growth-related skills evaluative attitude to own choices joy and satisfaction	**Evaluation**
	Objectives	**Objectives**	

The present study relies on videographic research (i.e. we video-recorded the preschoolers' craft sessions with one stationary camera), which relies on the analysis of ecologically valid real-word learning settings (Kozinets & Belk, 2006; Flewitt, 2006; Knoblauch, Baer, Laurier, Petschke, & Schnettler, 2008). According to Johansson (2011), a videographic approach is an adequate method for studying craft teaching and learning, especially for making hidden aspects of craft learning visible. Further, we interviewed each child about the craft-making process (i.e. stamp printing); theses interviews were also recorded by video. The data consist of the video recordings from the preschoolers' stamp printing activities (51 minutes + 56 minutes from two groups) and the children's interviews (1 hour and 31 minutes in total). At the beginning of the stamp printing session, children were inquisitive about the camera, but they soon forgot about its presence after its purpose was explained to them. The children's products (fabric bags) were also photographed to combine makers, products, and processes together. Eder and Fingerson (2001) observed that combined methods are often useful for capturing the richness of the human experience, especially in child research. Because of the cramped environment, and because young children were moving about, the video camera was placed in the corner of the working space. This decision apparently affected the quality of the video recordings: some of the children were working at the edge of video screen while others were turned away from the camera, making it difficult to observe their work. However, most child research situations are fast-moving and complex, and trying to capture and record everything is impossible (Walsh, Bakir, Lee, Chung, & Chung, 2007). Therefore, the aim was to record the children's activities in the best possible way and to select the most representative episodes of the children's working processes later, after careful observation.

The other data set consisted of interviewing each pupil individually, and these situations were also video-recorded to capture gestures and other nonverbal interactions (Danby, Ewing, & Thorpe, 2011). Children's knowledge about stamp printing was the main topic of the interviews, which were conducted two weeks after fabric printing due to the kindergarten's schedule. Because the interview process was new for the children, each child was told what an interview is, how the author and child would examine the child's product together, and that there were no wrong answers. The interviews resemble the stimulated recall method because the children had their bags with them to stimulate their memory (Kortesluoma, Hentinen, & Nikkonen, 2003) and to provide an opportunity for them to describe the making process. The purpose of stimulated recall interviews is to provide the interviewee with different kinds of stimuli (e.g. photographs, pictures, and video and audio recordings) to help him or her recall the original situation and thus increase the reliability of the data (Fox-Turnbull, 2009). The interviews were short, five minutes on average, and they were not prolonged if a child was not willing to talk, if the child's concentration was insufficient, or if he or she was busy playing with others. When children are interviewed, it is important to proceed on their terms (Eder & Fingerson, 2002; Kortesluoma et al., 2003).

In video research, data analysis is usually based on disciplined observation of the video recordings (Derry et al., 2010). To answer the research question about the preschoolers' perceptions of the craft-making process, the video material has been observed several times. First, observation of all video data from the stamp printing session in the two groups was used to create an overview of the session and to select the children the video covered throughout their entire working processes. Later we focused on increasingly smaller details of the children's activities (working, speaking, moving, gestures, and interactions with others), made notes, and transcribed the speech. All these components reflected pupils' concentration on the task. We selected some examples for closer inspection. One stamp printing process was eventually selected from among several alternatives for detailed analysis, and this process is described in the results. Three other examples of children's interviews highlight embodiment in explaining craft making. Children's embodied expressions are shown in the present article as cartoon-like drawings to help maintain anonymity and bring some new perspectives to text-based presentations (Flewitt, 2006; Koskinen et al., 2015).

Results

The central idea of this fabric-printing task was to investigate the ability of preschoolers' to learn a craft process by doing, to understand the nature of the process, and to explore the way in which the children verbalise the making phase. This technique is often used in practice with children to examine pupil's know-how by asking them to explain the making process. This is similar to self-explanation, where students explain some aspects of their learning process (Towse, Ball, & Lewis, 2012). In the stamp printing session, all the children worked enthusiastically and peacefully. The children had already learned school-like skills during the first three weeks at preschool. They listened to instructions carefully, and they were moving with restraint in the working area. Due to the liquid colours, white fabrics, and constricted workspace, work safety was emphasised during the session. Although the children were provided with similar materials, they implemented their own versions of the task without copying the ideas of others, which is typical for young children. Bags were patterned according to instructions: some bags were scarcely patterned while others were generously and colourfully patterned. Some bags were decorated with different-coloured stamps, but many children used wooden stamps to shape patterns like Christmas trees, houses, robots, windows, or their own faces. Overall, the children were focused on the task, and the joy of working was clear in their demeanour. Pseudonyms have been used in place of the children's names. Preschoolers Robin, Joe, and Sheila are used in this article when providing excerpts of young children's methods of craft

learning. It should be noted that all the children's bag-making processes were identical, and many other children's learning processes could have been used here as examples.

Robin's stamp printing process is an example how a preschooler perceives and makes crafts. Robin was arbitrarily selected as an example because his position in regard to the camera was favourable. Under detailed examination, Robin showed a lot of self-control and initiative: his work proceeded deliberately and was self-directed. Thus, the adults allowed him to work at his own pace, without offering too much help.

During the teaching session (demonstration), the tampering of the bag and brush helped Robin to focus on listening to instructions. His facial expression conveyed his concentration, which was due to a sincere interest in the task. Robin's facial expressions and body language can be interpreted as perception of the task: what to do and how to work, both generally and with his own bag. He worked carefully, guided by the teacher's demonstration. This became evident, for example, in that Robin always remembered to wash his brush when changing the colour as well as to press away excess colour on the stamp using whipping paper before printing, in accordance to the given instructions. Robin's stamp printing process is described in the form of a timeline in Table 2.

Table 2.

Robin's Stamp Printing Process.

Min.	Action	Robin's embodiment
1:14	Looks at his bag while waiting for the class to start.	 Robin spreads colour onto a stamp.
1:43	Spins the bag in his hands while listening.	
5:45	Takes a brush in his hands and spins it while listening to the instructions on colour use.	
9:16	'I can choose by myself.' Starts looking at the available woodblock stamps.	
9:25	Chooses a stamp and taps it with the brush. 'This, this, and this.'	
9:36–9:40	Asks Susan (the girl sitting next to him), 'Or would you rather take this?' and offers his stamp. Spins the wooden stamp in his hand.	
10:07 – 10:10	Moves closer to the children working at the same table so they can share the colours. 'I could take these.' Begins work. Spreads colours with the stamp, makes an example imprint on a hand towel, and then a shape on the fabric.	 Robin stamps figures onto a stamp.
12:28 – 13:21	Goes to wash the brush and returns to his place. Resumes work.	
16:40	Asks the teacher where the dirty stamps should be put, and then puts his on the paper plate as per the instructions.	
16:46	Goes to wash the brush. Waits for his turn at the sink.	
17:34	Returns to his seat and asks the teacher, 'Is there orange?'	
18:00	Following the teacher's request, moves to work at another table, which has the orange colour. Takes his work with him as well as the brush and hand towel.	

19:21	The teacher asks him to move back to his own table so that Susan can use orange as well. Carefully places the bag on the table. Continues work.	
23:15 – 25.18	Dries the print with a hairdryer and returns to his place.	
25:38	Goes to wash the brush. Speaks to the girls while waiting for his turn.	
26:39	Selects a new wooden stamp and begins to print a spruce wood shape.	
29:00	Switches to a circular wooden stamp.	
30:19 – 31:50	Talking to himself: 'Well then, now I just need to change this paper.' Goes to get a clean hand towel. Resumes work.	
32:04	Asks the teacher to look at his work.	Robin checks the bag's reverse side.
33:05	'Pläts!' he says to himself as he works on his image.	
34:51	Reports that his work is done.	
35:15	The teacher gives instructions on finishing up. He asks the teacher about the numbers on the handle of the brushes and inspects them.	
35:38	Goes to wash the brush and takes out the trash.	

One side of Robin's bag consisted of a rich, varied collection of colours and differently shaped stamps (Figures 1a and 1b). The other side of the bag was very different. Robin used the triangular stamp to form a Christmas tree pattern in the middle of the bag, and the edges of the bag were decorated with Christmas ball ribbon, as he later explained in the interview. Based on the different patterns on both sides of the bag, we can interpret that he realised the various possibilities of stamp printing while engaged in the process. From time to time, he stopped to examine his work, tilting his head sideways and looking at his bag from a little further away. He was not a shy child, even though he worked quietly, talking by himself and immersed in his work while ignoring the other children's talking.

Figure 1. Robin's bag. First side made (1a); second side (1b).

Capturing the children's actions using videos as well as photos of the ready-made bags was crucial for returning to the situations later. Both preschool groups' activities included many details that were important for this study but were impossible to notice during the craft-making process. Observations of the videotaped material provided a more holistic, general understanding. Details about the way in which the children worked with the fabric-printing task and their embodiment did not become clear until the video was watched several times. This type of method resembles ethnography, where a video camera replaces written field notes (Degerbøl & Svendler Nielsen, 2015).

In the following, we will describe the preschoolers' interviews and how the children bodily indicated their craft making when they were talking about it. Children often use non-verbal communication such as laughs, head nods, and hand or finger gestures along with spoken language to say more about their processes if they lack the sufficient linguistic skills to explain their thoughts (Milne & Edwards, 2013). Fredriksen (2011) used the concept multimodality to describe the way in which young children communicate through their bodies and materials to make meaning of their environment. Bodily expressions, such as moving the head and tongue, can also be unintentional strategies for focusing on the issue. This is easy to notice when observing, for example, children's craft making, drawing, music making, or play.

In the interviews, children were asked to explain the main bag-making phases. All the children remembered all the phases of making: cutting the bag fabric, colouring the stamp with a brush, and making the first stamp onto a paper sheet to remove extra colour from the stamp. Some of the children's descriptions were fluent and independently explained, whereas other children needed some help to find the right words to express themselves; perceiving the steps of the work was not problematic for any of them. While the connection between missing words and gestures was not systematically explored in this article, it should be noted that the children who were capable of fluent verbal expressions used less non-verbal communication in the interviews.

Robin's interview situation was a typical snapshot of everyday kindergarten activities: the interview was conducted during outdoor play, and Robin was wearing his outdoor garments. Despite the interrupted play, Robin eagerly talked about his decorated bag, although he forgot some words. In those situations, Robin used hand gestures to describe his thoughts. For instance, he described fabric cutting and the movement of scissors' blades by opening and closing his fingers and moving his hand along an imaginary fabric edge. At the same time, he made a sound like 'naks, naks' with his mouth.

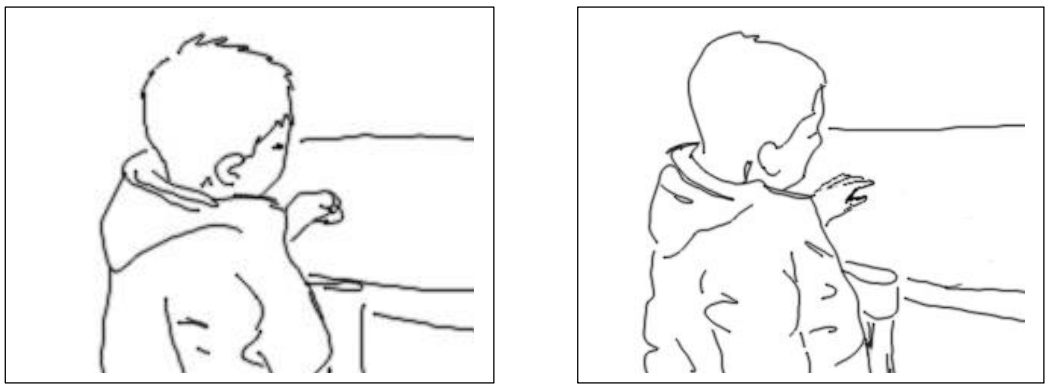


Figure 2. Robin shows the movement of scissors' blades by opening and closing his fingers.

When Robin talked about drying the colour with a hair dryer, he held a fictional bag in his left hand and a dryer in his right hand. Also, he embellished his explanation by blowing air with his mouth (Figure 3a). When asked about fixing the colours permanently onto the fabric surface, Robin remembered ironing, which he described with ironing-like movements. Simultaneously, he recounted an ironed hama-bead task from an earlier season in the kindergarten. Robin's bodily way of expressing his thoughts was implemented in many situations. His description about using a paper sheet inside the bag to prevent the colour from spreading to the other side of the bag also included considerable embodiment.

Figure 3. Robin explains using the hair dryer (3a), ironing (3b), and the colour spreading to the bag's reverse side (3c).

Joe's actions during the interview are an example of a young child's rich embodiment. Despite some missing words and vocabulary, Joe described his stamp printing very well, using numerous embodied expressions to compensate for his lack of words. He used hand movements to describe the stages of the making and handling tools. His embodiment resembled a pantomime. Joe decorated his bag symmetrically using his favourite colours: yellow and light green patterns. When Joe was interviewed about the layout and his way of working, he several times said, 'I did this way and that way'. This verbal answer did not in itself explain very much; however, at the same time, Joe made specific hand gestures and movements that described the placement and directions of the figures (i.e. placement of stamp patterns). It became evident that his design involved a lot of planning and doing that required the perception of hand and eye co-operation. These bodily expressions (i.e. hand gestures) revealed that Joe carried out patterning in the corners, and the placement of the balls in the middle was accurate, with the balls positioned an even distance from the edges of the bag. Then, he made an arrow pattern (Figure 4b) from the middle toward the bottom of the bag.

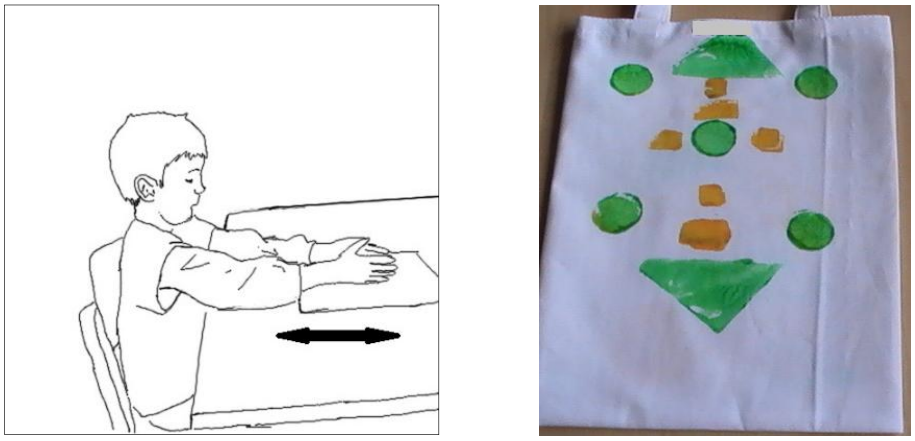


Figure 4. Joe explains the figures' placement with his hands (4a). Joe's completed bag (4b).

For symmetry, Joe wanted a similar pattern as a mirror image upward, but he had insufficient space, which he had not taken into account initially. Therefore, Joe had to locate the upward arrow closer than the first arrow to the edge of the bag.

As with the other children, Joe was asked to explain the process of stamp printing. Verbally, he replied that 'we take a brush and placed there and painted on it. Then pressed on here'. To indicate the review time, he gestured with his hands to show the technical execution of the motion (Figures 5a and 5b). While explaining verbally, he made gestures with his hands, mimicking the action of stamp printing. Based on these hand gestures, it became apparent that he had learned the stages of stamp printing. Similarly, he expressed with his bodily movements that a hand towel was located on the right side of the work.

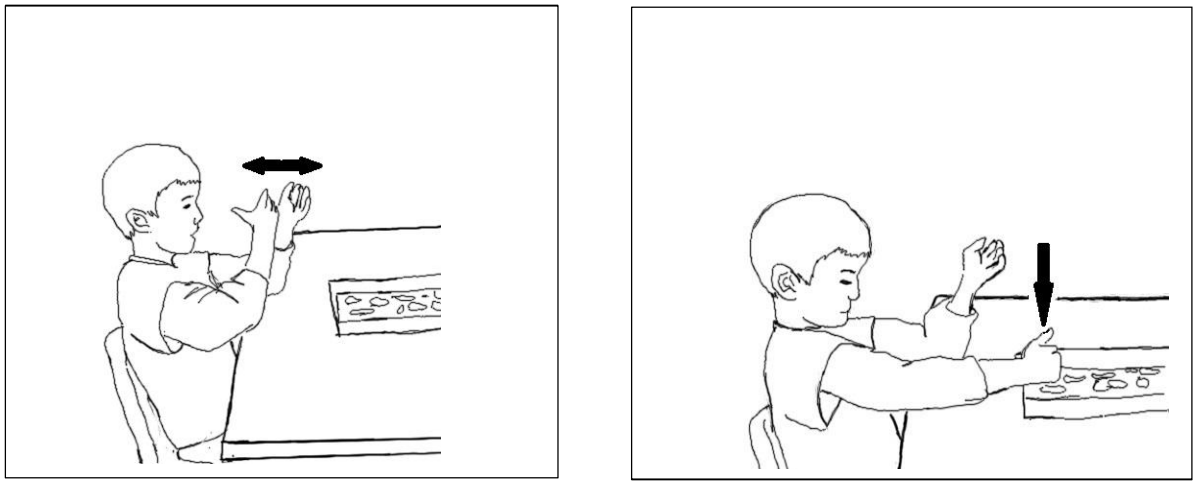


Figure 5. Joe shows how to hold a stamp in the left hand and spread colour (5a), and then how to print a figure onto the fabric (5b).

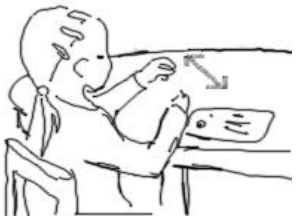
Verbalising is an interpretation of the making. Sheila was a brisk girl with good linguistic skills, which enabled her to verbalise the stamp printing technique clearly. There were also some other children who gave similarly clear answers about the stamp printing phase, but Sheila showed an evaluative attitude to her pattern design as well. She explained that the more 'pink' side of the bag is the better side in her opinion. She also said that she would have liked to print a flower figure on the emptier side of the bag, but she did not have enough time to make it. At the same time, she described with rotating finger gestures the placement of the designed flower's round centre and its petals. Evaluation allows for the collection of holistic craft process phases (Pöllänen, 2009), but evaluation is also an integral part of preschool education on a larger scale (EOPS, 2014). Craft-making situations offer good opportunities to prepare self-assessments as they provide feedback on the children's verbal skills. Craft designing does not always need to lead to a ready-made product: designing can also take the form of images and words.

Figure 6. Sheila describes her designing (6a). Sheila's bag from both sides. First, she made the left side (6b) and then the right side (6c).

As mentioned earlier, the maker's thinking cannot be understood until talking with him or her about the process. The ways children talk about making and their own thoughts vary from person to person. Robin's and Joe's interpretations with gestures were as effective as Sheila's fluent talk.

Table 3.

Sheila's Answers about the Main Steps of the Bag Theme and Her Embodied Expressions about Some Making Phases.

Speaker	Question/Answer	Sheila's embodiment
Question	How did you make these designs?	 Sheila shows how to spread the colour onto the stamp.  Sheila shows how to use the stamp on the fabric surface.
Sheila	Well, first we took a wooden block and put colour on it with a brush and then put it on paper and then finally onto the fabric.	
Question	Correct. Why did you put it on paper first?	
Sheila	Well because, so there doesn't come a very thick layer of colour.	
Question	Tell me, how did you cut this slice of a bag? You have a cardboard cutout and what did you do then?	
Sheila	Well, my partner went to stand on the design and the other drew.	
Question	Yeah. Where did the other draw from?	
Sheila	Along the edges.	
Sheila	We cut along the lines.	
Question	Is cutting the fabric easier or harder than cutting paper?	
Sheila	Easier.	
Question	Why is it easier?	

Sheila	Well, because the scissors I have aren't good for cutting paper.	

Even if the answers were concise, it can be seen that Sheila well understood what she had made and why. It is obvious that she would have been able to repeat the bag-making task if asked. Her responses typify children's way of answering succinctly, using only a few words (Danby et al., 2011; Milne & Edwards, 2013). When working with young children, their limited ability to express themselves must be taken into account—they often know more than they can express with words.

Discussion

This article aimed to contribute to the research on the educational values of early childhood craft learning by focusing on preschoolers' embodied aspects of handicrafts. In general, crafts are considered to be useful and comfortable for young children individually, but craft making with a group of children is difficult because children often need a lot of adult help on technical matters during the process. Even so, young children must gain experience in craft making if they are to learn. Young children's craft making may seem to be arbitrary, but a detailed examination shows that children undergo similar phases of perceiving, making, and interpretation as older makers. Children learn through experiences, which are also mostly embodied. In the making phase, children's embodiment could be noticed from small hints: facial expressions, head and hand movements, or eye targeting. All the preschoolers, who participated in the stamp printing activity focused on much more than just making: they thought about choosing shapes and colours, beginning with the stamps' geometric forms and their placement onto the fabric, and considered what could be implemented with those stamps. They also worked logically and were able to later explain the main steps of constructing the bags. Thus, their craft activity was similar to a small-scale holistic craft process, although the craft product's theme, the bag, was common to all and they received some help from the adults.

Embodiment is closely linked to children's thinking. When talking about earlier experiences, children often strengthen their verbal message with bodily expressions, as the children did during the interviews about the stamp printing task. This is apparent not only with craft tasks but also with children's play, where imagination is strongly present in their words and gestures. Imaginary scissors, irons, or stamps were detected from the children's embodied expressions in our study. To a teacher, the embodied indications of understanding are essential because they reveal whether a student has understood the instructions since gestures are considered to be visible signs of understanding (Ekström et al., 2009).

In addition to other ways of learning, embodied interactions may help many kinds of students to learn. Students should be encouraged to make and observe gestures; gestures are used when designing, for example, for describing design ideas or demonstrating techniques. Students can practice using new tools or techniques by following the movements of another before using them in a real situation. Sometimes this can also be important to work safety. Manipulating and interacting with objects is a focal embodied learning strategy in design education, and it is increasingly used in other areas, such as science and mathematics education. In addition to interacting with objects that exist in the learning environment (e.g. tools and materials), students interact with and through the artifacts that they create in situ, that is, the design representations (cf. Streeck, 2011). Furthermore, a study on deaf and blind makers' embodied ways of thinking suggests that an efficient strategy for learning tacit skills is to perform with the student, that is, to take her hands and transfer knowledge tacitly (Groth, Mäkelä, & Seitamaa-Hakkarainen, 2013).

The skill-learning process involves small-scale support (scaffolding), for example, hints, especially when the learner's own skills are not sufficient to perform the task completely independently (Koskinen et al., 2015). In learning situations, the teacher can support students' articulation by providing them with the opportunity to teach the same thing to the teacher or to other students. Consequently, the teacher can ensure that the student has understood the learning task or all stages that are related to making as well as critical incidents from the making phases. In this study, we have tried to get as close to the children's thoughts as possible, allowing them to talk about making in their own words. Young students often need help in articulating their developing understandings—how to think about thinking as well as how to talk about thinking (Sawyer 2006, p. 12). Articulation is more effective if it is scaffolded by properly directing student's thinking or by providing concepts for thinking.

Modelling, coaching, and scaffolding represent the core of traditional apprenticeship in craft skills, where learning is supported through the processes of observation and guided practice (Lave & Wenger, 1991). From the pedagogical point of view, teacher demonstration is particularly important for young children because learning, as a specific skill, is based on modelling and imitation. However, it is crucial that teachers' demonstrations do not simply lead to the child copying the pattern or model; rather, they should stimulate and support the creation of the child's own ideas. The teacher can significantly influence this independence through his or her own actions, providing encouragement that facilitates students' own idea generation and encourages them to design their work in different ways. In practical learning situations, the learner perceives a given task based on the teacher's demonstration and understands that he or she can implement the task in a personalised direction. For example, immediately after the teaching session, the children can be invited to explore the available materials and chose the most suitable to their own project (Yliverronen, 2014).

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