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Abstract: This paper presents ideas about education and democracy embedded in studies on design literacy for sustainability. The descriptions of one semi-structured group interview study and one action research study provided in three research papers are analysed in light of three different conceptions of education and democracy. The analysis outlines how the research methods used in situations in which students (1) engage in questions, introductions and tightly structured tasks developed from research-based knowledge; (2) interact with and share their thoughts and reflections in groups; and (3) respond to open-ended questions contribute to *research enabling design education for democracy*, *design education through democracy* and *democratic design education*, respectively. These results are of relevance to the development of both education and educational research concerning design literacy.

Keywords: design literacy, design education, democracy, educational research

1. Introduction

This paper responds to the call for insights to democracy in research, embodied in the theme 'Track 25: Pasts, presents, and possible futures of Design Literacies', which seeks to summarise insights into and research and practice on design literacy. Moreover, it responds to the proposal in the call 'that all people be versed in design approaches to have a "say" and act on how today's artificial world is shaped' (Bravo et al., 2021). In this study, I examine and discuss an aspect of design literacy for sustainability that has been less elaborated on in my research (Maus, 2017, 2019a, 2019b, 2020). This aspect concerns how research in design education for youth can support students' opportunities to have a say and act on how today's artificial world is formed, particularly their opportunities to have a voice in research that shapes their design education. This study focuses on the ways in which research methods can support students' democratic participation in research on their design education.

Educating for democratic participation in the development of sustainable societies is strongly emphasised in research related to design literacy in general education. An early example of this is Digranes and Fauske's (2010) paper, 'The Reflective Citizen: General Design Education for a Sustainable Future'. In their article, Digranes and Fauske (2010) discuss the role of general design and crafts education in developing a 'reflective citizen that is capable

of promoting a sustainable future through choices and actions' (p. 367). This text has influenced the development of my research. However, while conducting a literature review on sustainability as a topic in general design and crafts education in the Norwegian school subject Art and Crafts, I found that students rarely had a voice in research in this field during its first decade (2010–2020). A structuring of research and documents on the framework for curriculum inquiry (the ideological, formal, perceived, operationalised and experiential domains; Goodlad et al., 1979) revealed that studies have focused on the perceived interpretations in research, arguing for the inclusion of sustainability in design education (Digranes & Fauske, 2010; Illeris, 2012; Lefdal, 2005; Lutnæs, 2015a, 2015b, 2017, 2019/2021; Lutnæs & Fallingen, 2017; Nielsen, 2009; Nielsen & Brænne, 2013; Nielsen & Digranes, 2007, 2012; Orheim & Nielsen, 2017), perspectives among art and crafts teachers (Fallingen, 2014; Idland, 2015) and perspectives in assessment rubrics (Lutnæs, 2018). An exception is the work of Løkvik and Reitan (2017), in which experiences from a classroom-based action research project with sixth graders (aged 11) are presented. Together with documents on ideological political intentions and the formal introduction of sustainability into curricula, this research has been the main source of knowledge in the field. Consequently, there has been a gap in research-based knowledge concerning students' perspectives on operationalised education and experiential learning in design and sustainability. This is where I positioned my research on the enhancement of youths' design literacy for sustainability in lower secondary education (Maus, 2017, 2019a, 2019b, 2020). Given the scholarly emphasis on democracy and the development of research publications, the state of research should be read as an indication of an emerging field rather than as an intention for the top-down implementation of sustainability in general design and crafts education for youth.

Nevertheless, the topic of students' opportunities to have a say in research on and for the development of their education should be on the design literacy research agenda. In this paper, I present an analysis of the research methods used in the data construction in three of my previous publications (Maus, 2017, 2019a, 2019b) by using new theoretical lenses. The aim was to identify how the different research methods applied in the data construction, namely, semi-structured group interviews and action research, supported the students' democratic participation in and contribution to research on design education. These research methods are essential to the development of future research projects in the field of design literacy.

2. Method of enquiry

The analysis presented in this paper was conducted by revisiting my article-based PhD thesis, Enhancing design literacy for sustainability: Craft-based design for sustainability in lower secondary education in Norway (Maus, 2020), and analysing conceptions of democracy embedded in the research methods for data construction.

Three different conceptions of education and democracy, presented in the chapter 'Education and the Democratic Person' of the book Beyond Learning: Democratic Education for a

Human Future by professor of educational theory Gert J. J. Biesta (2006, pp. 117–145), were used as the framework for the analysis. Biesta (2006) derives these three conceptions from the works of Immanuel Kant, John Dewey and Hannah Arendt and elaborates on their differences as follows:

- *Education for democracy*, with individualistic conceptions of the democratic person
- *Education through democracy*, with social conceptions of the democratic person
- *Democratic education*, with political conceptions of the democratic person

The aim of the analysis was to identify the research methods used in situations in which students participated in the construction of research data in accordance with the three conceptions of democratic involvement. These research methods supported the students' democratic participation in research regarding their design education. Consequently, the focus of the analysis was the research methods used in situations that contributed to the research results published in three articles of the researcher's PhD thesis (Maus, 2017, 2019a, 2019b). Such situations that supported the students' possibilities to have a real democratic say in research on their education. The research methods of the data construction were as follows:

Semi-structured group interviews (Brinkmann & Kvale, 2015; Fontana & Frey, 2008), which were conducted with seven 10th graders in two focus groups (aged 15–16). The interviews were conducted when the students were about to complete a ceramic product making project in May 2015. Video-recording transcripts from these interviews formed the data for the research published in article 1, 'Developing Holistic Understanding in Design Education for Sustainability' (Maus, 2017), and article 2, 'Developing Design Literacy for Sustainability: Lower Secondary Students' Life Cycle Thinking on Their Craft-Based Design Products' (Maus, 2019a).

- An action research project (Hiim, 2016; McNiff, 2013, 2014), which was conducted in collaboration with two teachers and 26 eighth graders in two groups (aged 12–13). This action research was conducted with a woodwork project from August 2015 to January 2016. Observation notes, video-recording transcripts, timekeeping, students' written responses to tasks and self-evaluation questions in their project books, and log and meeting memos formed the research data. The research was published in article 3, 'Enhancing Design Literacy for Sustainability among Youth in Crafts-Based Design Education' (Maus, 2019b).

The research methods applied should support real possibilities for students' democratic actions of influence on the research results. As Biesta (2006, p. 121) remarks, although schools cannot create or save democracy, they can support society with real possibilities for democratic action and subjectivity. This is relevant not only to education but also to educational research in schools.

3. Results and discussion

Questions about the relationship between education and democracy are both eternal and of current interest. The international political initiatives in *Education for Sustainable Development* and the *National Curriculum for Art and Crafts* in Norway emphasise democratic participation in sustainable development (United Nations Educational, Scientific and Cultural Organization, 2014; Utdanningsdirektoratet [The Norwegian Directorate for Education and Training], 2020). Biesta (2006) points to the eternal aspects of such questions and writes, 'Ever since its inception in the *polis* of Athens, political and educational thinkers alike have asked what kind of education would best prepare the people (*demos*) for their participation in the ruling (*kratos*) of their society' (p. 118). He raises questions about the kind of subjectivity education should enhance to prepare students for democratic participation in society. To enrich the discussion, Biesta (2006) outlines three ideas of what it means to be a democratic person and discusses how education can support democracy. The present analysis of situations in the semi-structured group interviews and the action research indicated that all three conceptions are embedded in the research methods for data construction and contribute to the research results reported.

3.1. Research enabling design education for democracy

Education for democracy is the first conception of education and democracy outlined by Biesta (2006), which he derives from the literary work of Immanuel Kant (1724–1804). Biesta (2006) describes it as the idea that education must prepare students for future participation in the democratic process. This can be achieved by supporting students' development of the knowledge, skills and values they need to exercise their democratic rights. This idea of education is related to an *individualistic conception of the democratic person*, expressed in the work of Kant. Kant emphasised rational, autonomous subjects who can think and make judgements for themselves, and that the role of education is to release the rational potential of the human subject (Biesta, 2006, pp. 123-124, 127-128, 135-137). However, Biesta (2006) points out that we cannot know how people will choose to use their knowledge. In the publications from the semi-structured group interviews and the action research (Maus, 2017, 2019a, 2019b), *education for democracy* might be the most noticeable conception of education and democracy. This is revealed in the research method used in the situations in which the students engage in questions, introductions and tightly structured tasks developed from research-based knowledge on design for sustainability (DfS). This knowledge included DfS principles of life cycle thinking (LCT) regarding raw material extraction, manufacturing, distribution, use and disposal of products (Cooper, 2005; Heiskanen, 2002) and the triple bottom line aims of sustainability with environmental quality, social justice and economic prosperity (Elkington, 1999). Moreover, DfS practices in product design focus on eco-efficiency with low use of resources cradle-to-grave (Cooper, 2005, 2010), eco-effectiveness with circular use of resources cradle-to-cradle (McDonough & Braungart, 2009, 2013) and product durability and longevity (Chapman, 2009, 2010, 2015; Cooper, 2005, 2010; Stahel, 2010). Heiskanen (2002) highlights the advantages of buyers and suppliers sharing the concept of LCT. By engaging in

questions, introductions and tasks based on LCT and related DfS principles and practices, the students acquired knowledge and skills to democratically participate in the development and assessment of environmentally considerate solutions in product design.

In the research published in article 2 (Maus, 2019a), the students engaged in interview questions about the environmental context of the ceramic products they made. These questions were based on the DfS principles and practices described above. The questions were organised in an interview guide, which was used as the research tool in the semi-structured group interviews (Maus, 2020, Appendix 1). The aim of the study was to identify the correspondence between DfS principles and practices and the students' use of knowledge acquired through craft-based design when reflecting on the questions. Hence, through this approach, the potential of embedding and exemplifying DfS in the students' craft-based design work was studied. The interview questions that the students engaged in concerned the environmental context within the three life cycle phases of their ceramic products. The first was the material extraction phase, which was before the craft-based design practice, with the topics of ecological resources for material extraction and human resources in the process of material extraction. The second was the production phase, which was during the craft-based design practice, with the topics of effective use of materials, health, environmental and security precautions, and production and product value. The last was the use and disposal phase, which was after the craft-based design practice, with the topics of functional qualities and products' purposes, product emissions during use, emotional qualities of personal belongings and gifts, outer aesthetic qualities and craftsmanship, intrinsic product qualities and solid, repairable constructions, and safely disposable or recyclable products (Maus, 2019a, pp. 6–9).

The exemplification of DfS in the students' craft-based design work was further observed in educational practice in the action research published in article 3 (Maus, 2019b). In this study, the students engaged in introductions and tightly structured tasks on the practice of environmental considerations in their craft-based design of a bentwood box. These introductions and tasks were organised in a project book, which was used as the research tool in the action research (Maus, 2020, Appendix 2). The introductions and tasks were developed from research-based knowledge on DfS and educational theory on task sequencing to promote students' learning of knowledge (Edwards, 2015). The research aim was to study the possibilities and challenges involved in enhancing design literacy among youth through engagement with examples of DfS principles and practices. The introductions and tightly structured tasks that the students engaged in focused on the following: 1) design and sustainability; 2) functional design; 3) traditional design and unique details; 4) accuracy in craft; 5) materials with a sustainable life cycle; 6) construction, repair and maintenance; 7) and value, price, wages and material costs (Maus, 2019b, pp. 97–98).

The research methods used to engage the students in research-based knowledge in these semi-structured group interviews and action research studies maintained the idea of and

contributed to *education for democracy*. They illuminated possibilities for supporting students' development of the knowledge and skills they need to exercise their democratic rights in craft-based DfS. Hence, these research approaches contributed to *research enabling design education for democracy*.

3.2. Research enabling design education through democracy

Education through democracy is the second conception of education and democracy outlined by Biesta (2006), which he derives from the literary work of John Dewey (1859–1952). Biesta (2006) describes this as the idea that students prepare for democracy by taking part in democratic life. This means that schools should have democratic structures and should practice democratic processes and forms of education, which is based on the idea that students also learn from their experiences when taking part in situations and not only from what they are directly taught. This idea of education is related to a *social conception of the democratic person*, expressed in the work of Dewey. Dewey emphasised that although humans are rational beings with the capacity for thought and reflection, they form and transform their habits of thought and reflection through interaction within the group or culture of which they are a part. These social groups should preferably facilitate an interplay of many interests, allowing individuals to develop greater diversity of their personal capacities, rather than being isolated and restricted to limited interests (Biesta, 2006, pp. 124-125, 128-132, 135-137). Despite the focus on democratic forms of education, the idea of creating democratic persons through processes is instrumental (Biesta, 2006). In the research publications on the semi-structured group interviews and the action research (Maus, 2017, 2019a, 2019b), the conception of *education through democracy* was visible in situations in which students interacted with and shared their thoughts and reflections in groups.

The students' sharing of reflections in the semi-structured group interviews showed how they used their experiences from the craft-based designing and formed their thoughts on their ceramic products' life cycles as they reflected together. The engagement among the students during the group interviews and how they developed a greater diversity of their personal capacities were elaborated in article 2 (Maus, 2019a). The detailed descriptions of the students' reflections on the interview questions encompassed dialogue, in which they drew on experiences from their craft-based design work and followed up on and added to one another's statements. This indicated that the mutual reflections on the interview questions helped the students develop their capacities to reflect on the topic. Meanwhile, they also developed their perspectives on the topic, so their answers reflected the views they had developed through their discussions during the group interviews. One example is the situation in which the students discussed whether their ceramic products could be safely disposed of or were recyclable. The students had never heard of ceramic recycling. They reasoned that it is impossible to melt ceramics back into clay for new ceramic products, either because the consistency of the clay becomes too hard during firing or because it is difficult to separate the clay from the glaze fused onto it at a couple of thousand degrees Celsius. They reasoned that disposed ceramic products are burned in waste incinerators or disposed

of in landfills. This led to mutual reflections about whether it was safe to store glazed ceramics in landfills. The students reasoned that glaze consists of different metals that are unlikely to leak out in a landfill (Maus, 2019a, p. 9). In this situation, the students themselves expanded one another's capacities for reflection on the disposal of ceramic products by bringing their perspectives on glazing, waste incineration and waste disposal in landfills into the discussion about the possibilities of ceramic recycling.

In the action research, the students' democratic sharing and development of capacities for reflection were used somewhat differently. The students' and teachers' sharing of reflections about environmental concerns in their woodworking classroom during 18 lessons was presented in article 3 (Maus, 2019b). These descriptions illuminate the possibilities of including mutual reflections on DfS in the craft project during decision-making situations regarding the design in sketches, work drawings and material selection, as well as in assessments of the students' finished products. One example is the situation in which the teacher asked the students about the meaning of the term 'life cycle'. One student responded by explaining the life cycle of a tree, which makes up the main raw material in the bentwood boxes that the students were making in this woodwork class. The teacher confirmed and elaborated on the life cycle of a tree before asking the students which other materials they had used in their boxes. The students mentioned the other materials they used (i.e. rattan, leather thread, polyvinyl acetate [PVAC] glue and oil) and asked questions about these, including why they treated the surfaces of their boxes with oil, suitable types of oils for boxes intended to contain food and the possibilities of composting, incinerating or reusing the materials (Maus, 2019b, pp. 99–100). In this situation, the students improved one another's capacities to reflect on the topic, as well as their perspectives on the topic, during classroom discussions; their teacher encouraged the sharing of reflections and the development of capacities by responding and asking elaborative questions.

The use of the research methods in these semi-structured group interviews and the action research maintained the idea of and contributed to *education through democracy*, particularly in situations in which the students interacted and developed their capacities by sharing their thoughts and reflections in groups. Thus, these research approaches also contributed to *research enabling design education through democracy.*

3.3. Research enabling democratic design education

Democratic education is the third conception of education and democracy outlined by Biesta (2006), which he derives from the literary work of Hannah Arendt (1906–1975). Biesta (2006) describes this as the idea that education should enable students to take the initiative and act in a world of plurality and differences without obstructing the opportunities of others. This is considered more essential than education preparing students for future participation in democracy. This idea of education is related to a *political conception* of the democratic person, expressed in the work of Arendt. Arendt emphasised human interaction, in

which humans become subjects by acting and bringing their initiatives, described as beginnings, into the public sphere of the *polis* where they live, in situations in which other humans can also respond to and bring their beginnings (Biesta, 2006, pp. 132-143). In education, this is as much about listening, waiting and creating spaces for others to begin as it is about taking the initiative. Thus, this is not a self-expressive and child-centred approach without concern for others (Biesta, 2006). In the research publication on the semi-structured group interviews and the action research (Maus, 2017, 2019a, 2019b), the conception of *democratic education* was visible in the situations in which the students engaged with open-ended questions without right or wrong answers.

In the semi-structured group interviews, the students brought their initiatives into the group discussions on their education and made fundamental contributions to the research results presented in article 1 (Maus, 2017). When asked an open-ended question about their opinions on the relevance of learning about environmental concerns in product design in the school subject Art and Crafts, the two student groups expressed divergent perspectives. One student group had a positive attitude, whereas the other had a negative attitude towards environmental concerns as an educational topic in Art and Crafts classes. The student group with a positive attitude said that it is useful for both practical design and handcraft work in school and in everyday consumption, and that talking about the topic helped them understand it. The student group with a negative attitude reasoned that the environmental topic is theoretical with key answers and that it would only disrupt the school subject's purpose of engaging in creative processes and practical design. These two viewpoints became the steppingstones for the development and discussion of the *model of educational practice in DfS*, which outlines educational practice that includes and attends to students with both perspectives. The model is presented in the article and further used throughout my research on the topic (Maus, 2017, p. 160; 2019a, p. 10; 2019b, p. 103; 2020, p. 61).

In the semi-structured group interviews, described in article 2 (Maus, 2019a), the students also brought their initiatives into the group discussions. This occurred in the situations in which they reflected on open-ended questions about the choices they made during the designing and crafting of their products. Particularly regarding the outer aesthetic qualities and the intended use of their products, the students brought their beginnings or initiatives into the public. They elaborated on their choices and opinions about how their ceramic products' shapes, sizes, colours, decorations and combinations of glaze support the products' purposes. The students who were pleased with the results and expected to be content with the decoration for a long time were also the ones who intended to keep their products (Maus, 2019, p. 8).

In the action research, presented in article 3 (Maus, 2019b), the conception of democratic education was expressed in the students' responses to self-evaluation questions on their opinions about their experienced learning. These questions were formulated as open-ended questions with no right or wrong answers. The questions concerned what the students experienced to have learned during the project, whether they found anything too difficult and

their perspectives on the relevance of what they had learned. The use of these questions created a space where the students could take the initiative and bring their beginnings into educational research. Two of the questions concerned 1) problem solving for sustainable design, with choices in design, materials, construction and craft to reduce products' negative environmental impacts; and 2) craft, including the craft technique and the handling of materials and tools. The students' responses to the questions indicated that they associated practices in design for eco-efficiency and eco-effectiveness with learning about DfS, while they associated practices in design for product durability with learning about craft (Maus, 2019b, pp. 100–102). This approach contributed to the research results, as these students' narrations of what they experienced to have learned were unlike those expressed by the students in the research data constructed during classroom discussions and in the written responses to tasks in their project books. This mismatch opened a discussion on how the distinct characteristics of different DfS practices hold different possibilities and challenges for students' development of design literacy for sustainability. Thus, the students' initiatives contributed to the research with insights into the possibilities and challenges for educational practice on the topic.

The use of the research methods in these semi-structured group interviews and the action research thus maintained the idea of and contribute to *democratic education* in situations in which students engage with open-ended questions on opinions and choices and in self-evaluations without any correct answers. Thus, these research approaches also contributed to *research enabling democratic design education.*

3.4. Three approaches to democracy in the studies

The analysis of the research methods used in the situations leading to the results of the semi-structured group interviews and the action research (Maus, 2017, 2019a, 2019b) through the lenses of three conceptions of education and democracy (Biesta, 2006) revealed that these conceptions were all embedded in the research methods used, and all contributed to the research results. The results of the analysis were as follows:

The situations in which the students engaged in questions, introductions and tightly structured tasks developed from research-based knowledge related to the conception of *education for democracy;* thus, in the data construction, the research methods used in these situations supported *research enabling design education for democracy*.

The situations in which the students interacted and developed their capacities by sharing their thoughts and reflections in groups and classroom discussions related to the conception of *education through democracy*; thus, in the data construction, the research methods used in these situations supported *research enabling design education through democracy.*

The situations in which the students responded to open-ended questions without right or wrong answers concerning opinions, choices and self-evaluations related to *democratic education*; thus, in the data construction, the research methods used in these situations supported *research enabling democratic design education*.

The results are summarised in the table below.

Table 1. Representations of conceptions of education and democracy in the studies

	Research enabling design education for democracy	**Research enabling design education through democracy**	**Research enabling democratic design education**
Semi-structured group interviews	Knowledge-based interview questions	Shared reflections in group interviews	Open-ended questions on opinions and choices
Action research	Knowledge-based introductions and tightly structured tasks	Shared reflections in classroom discussions	Open-ended self-evaluation question

4. Concluding remarks

This study analyses and summarises how research methods enable students' democratic participation in semi-structured group interviews and action research on the enhancement of design literacy for sustainability (Maus, 2017, 2019a, 2019b). Ideas of democratic participation influenced the research ideas and the choices of the research methods used. However, the diversity of ideas on democracy and education embedded in the research in these studies has not been investigated in previous studies.

The results of this paper indicate that the conceptions of *education for democracy, education through democracy and democratic education* are all embedded in the research methods used for the data construction and contribute to different parts of the research results of both the semi-structured group interviews and the action research. The analysis showed the plurality of ways in which democracy is embedded in educational projects, as well as in the methods of data construction used in educational research. From these results, I derived the conceptions *of research enabling design education for democracy, research enabling design education through democracy* and *research enabling democratic design education.*

The analysis also showed how the situations in the studies supported the students' democratic participation in their design education and in research shaping the development of their design education. These results illuminate the potential of democratic design literacy research. Hence, these results should be seen as having equal relevance to the development of both education and educational research concerning design literacy. Ideas of democracy have been fundamental aspects of design literacy research since the earliest publications on this topic. A more nuanced understanding of the different opportunities for students to have a say in the development of their design education and related research would support democratic development in the field of design literacy.

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