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Examining Teaching Practices in Design and Craft Education in Iceland

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Abstract This article reports a survey which aimed to examine the present situation in Design and Craft Education (D&C) in Iceland in terms of teachers' general standing and their teaching inside the Icelandic elementary schools. A questionnaire was sent to 170 D&C teachers in Icelandic elementary schools. The questionnaire was completed by 101 teachers, and the response rate was 59.4%. The main research questions were:

1. What are the most common methods for teaching D&C?
2. How do D&C teachers utilise the Icelandic National Curriculum?
3. How *could the teaching better meet students' individual needs?*

Data were collected using an online questionnaire that was distributed to D&C teachers in all elementary schools in Iceland. Findings showed that D&C teachers base their teaching mainly on traditional teaching methods such as direct instruction, verbal explanation, practical demonstration and discussion with students during their work. The teachers were quite satisfied with their methods of teaching and were not willing to make dramatic changes. Nevertheless, they were interested in improving outdoor education, field trips and the use of information and communication technology (ICT) in their classrooms. Most of the teachers used the national curriculum for planning their teaching, but generally only at the start of the school year. The majority of the teachers based their teaching on student's individual needs in agreement with the present national curricula. The research indicates the importance of improving the teachers' practices in order to strengthen the subject's status inside the Icelandic school system. This could be done via in-service teachers' courses and seminars with teachers discussing the outcomes of the research.

Keywords
Design and Craft, online survey, pedagogy, educational research, enhancement

Examining Teaching Practices in Design and Craft Education in Iceland

The subject of Icelandic craft was established in 1890 as a result of influences from the Danish Sloyd model (Mikkelsen, 1891; Thorarinsson, 1891). Different curriculum for craft were developed in Iceland from 1936 until 1999, when craft was re-established as a new technological subject under the name Design and Craft (D&C). D&C is based on a specific rationale for craft education, technological literacy and innovation and design, and its main aim is to develop technological literacy and ideation skills in students (Menntamalaraduneytid, 1999).

However, little research has been conducted in the area of D&C in Iceland. Therefore, research is needed to examine its current situation in order to gain information about the status of the subject in such areas as, how the subject is taught and the congruency between the teaching practice and the national curriculum for D&C. This research could enable both practicing teachers

and teacher educators to improve their work and subsequently support the subject's existence in schools (Thorsteinsson & Olafsson, 2009).

First, this article briefly reports on the background of the Icelandic D&C subject and describes the Icelandic National Curriculum for D&C. Subsequently, the aim and the objectives of the research project and the research questions are stated and the research methods described. Finally, the findings are re-examined and discussed in light of the literature, and conclusions are drawn.

Background

Iceland provides a good standard of education (OECD, 2015). Every child has the opportunity to obtain an education regardless of gender, religion, disability, handicap, economic status, residential location or social background. The Iceland Ministry of Education (2014) is largely responsible for the provision of education in Iceland. However, local authorities are responsible for the operation of primary and lower secondary schools. The government maintains upper secondary schools and higher education institutions.

The Icelandic school system comprises four levels of education: pre-school education, compulsory education, upper secondary education and higher education. There are also specialised schools. Children attend pre-school and nursery from the age of twelve months to six years, with pre-school being the first level of the educational system. The majority of Icelandic children attend pre-school, and their fees are usually paid by local councils.

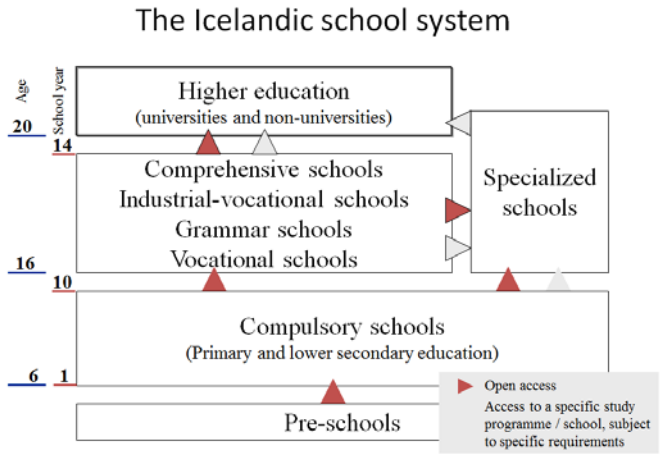

Figure 1. The Icel

Icelandic law states that education is compulsory for children from the ages of six to sixteen (The Icelandic Ministry of Education, 2014). As a result, the literacy rate is high in Iceland and has been so since the end of the eighteenth century.

D&C was introduced as a craft subject in Iceland in 1890 by the first educational director, Jon Thorarinsson (1891) under the influence of Scandinavian Sloyd pedagogy (Olafsson & Thorsteinsson, 2009). To fully comprehend the subject's role and significance in the context of this research, it is therefore necessary to give a brief description of the historical and pedagogical background of craft education in Iceland, now named Design and Craft (Menntamalaraduneytid, 1999).

At the time of the introduction of craft education in Iceland, the country was a Danish colony, and Icelandic scholars were, therefore, influenced by the Danish culture. This new Icelandic subject was first based on a system for Danish schools called Sloyd, which was developed by Axel Mikkelsen in his handicraft school in Copenhagen, Denmark. Mikkelsen established Sloyd as a

general subject in Danish public schools in 1883 under the influence of Cygnaeus, the originator of the Sloyd pedagogy in Finland, and the Swedish educationalist Salomon (Borg, 2006). The Danish Sloyd model was focused on bringing physical work into harmony with spiritual aspects (Thane, 1914) with the development of the potential of the whole child being the central focus.

The term *Sloyd* is related to the old Icelandic word *slægur,* with the original meaning being connected etymologically with the English word *sleight* (as in 'sleight of hand'), meaning cunning, artful, smart, crafty and clever (Borg, 2006; Den Danske Ordbog, 2003–2005; Nudansk Ordbog, 1990). Sloyd comprises school activities that use craft to produce useful and decorative objects. It is a pedagogical system of manual training that seeks to aid the general development of the child through the learning of technical skills in woodworking, sewing, knitting, and the making of useful objects by hand (Borg, 2006; Salomon, 1893).

The Development of the Icelandic National Curriculum for D&C

The national curriculum for craft education in Iceland have been based on various laws for general education. In the first public school laws, established by the Icelandic parliament in 1907, craft (school industry) was not included, but it was taught in many schools. Moreover, when the first national curriculum for the education of children was published in 1929, craft or school industry was still not mentioned. However, when a new law for children's education was passed in 1936, the subject was given a mandatory status (Eliasson, 1944).

Craft was first established as a subject in 1948. Instruction was gender-based with craft for boys and textiles for girls (Fraedslumalastjornin, 1948). The first integrated national curriculum for compulsory education was published in 1960. It was gender-specific, but it emphasised the general pedagogical values of the subject. Based on the above law, a new national curriculum was published in 1976–1977 (Menntamalaraduneytid, 1977). In this curriculum, *Art and Handicraft* was established as a new area for craft education. This included art, textiles and craft. For the first time, all the subjects were compulsory for both boys and girls. This curriculum was slightly revised in 1989.

Craft education in Iceland was re-established as a new technological subject in 1999 and renamed Design and Craft (Menntamalaraduneytid, 1999). The new subject was based on a rationale for technological literacy, innovation and design (Thorsteinsson, 2002; Thorsteinsson & Denton, 2003). The emphasis was on technologically-focused craft, based on innovation and design. These undertakings were expanded from an earlier curriculum with traditional aspects from technology education. It was also recommended to support the students' process of idea generation and the creation of artefacts with relevant knowledge.

Figure 2: Shows the emphasis of the D&C curriculum.

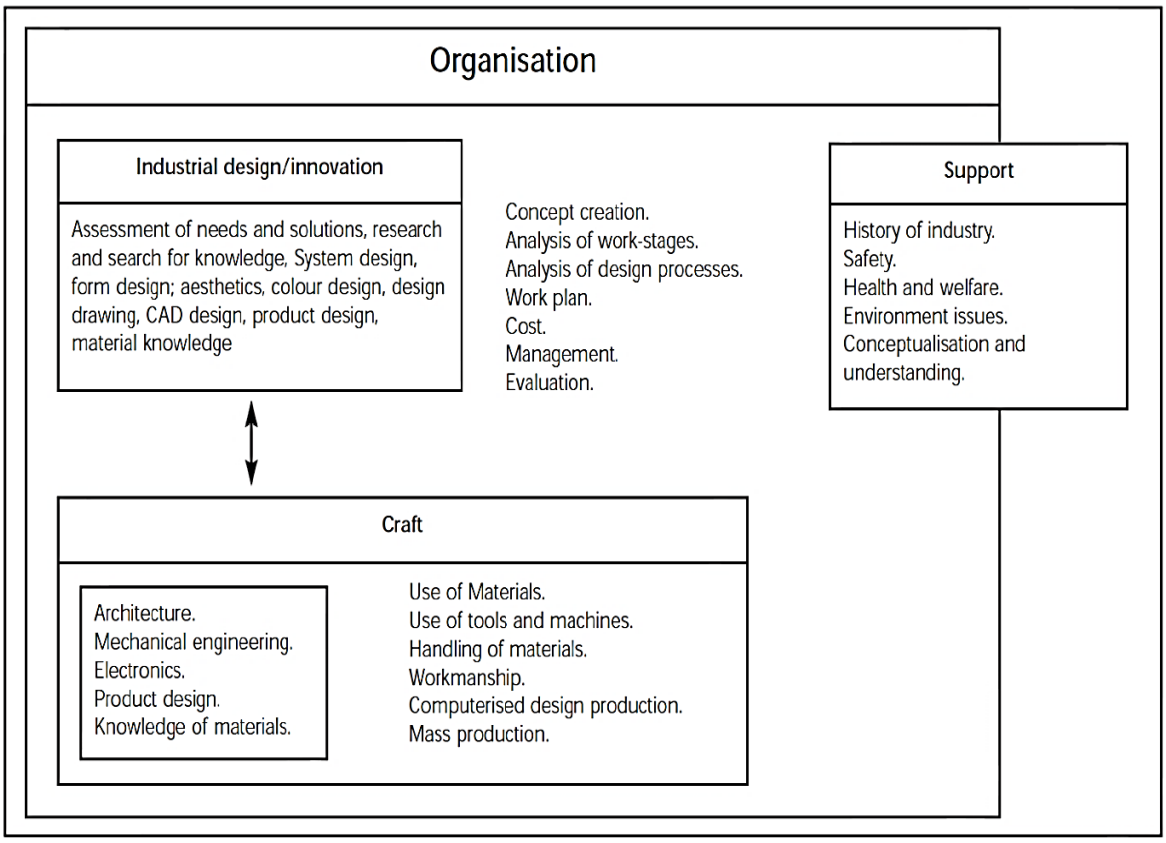

Figure 2: The infrastructure of D&C in Iceland (Olafsson &Thorsteinsson, 2013).

D&C is, at present, an independent subject in the national curriculum, and it resides within the area of vocational and technical subjects. The focus is on technologically-based D&C and innovation, both of which were expanded from earlier curriculum. The curriculum supports the students' process of idea generation and the creation of artefacts with relevant knowledge, such as knowledge concerning sustainable design, the history of industry and health and safety. Also, training students to organise their work is important. In addition, new components have been added, including outdoor education and green woodwork, sustainable design and health and safety. Individualised learning and flexible instruction are recommended in the present curriculum. The old Sloyd values have been revisited and can be seen once again in the rationale.

According to the present national curriculum, teachers have more freedom to construct the school curriculum and manage their teaching. The major emphases are listed in Table 1 (Menntamalaraduneytid, 2007).

1. Design and invention
2. Technical literacy
3. Technical skills and workshop management
4. Handicraft and organizing the work

5. Focus on individuals
6. Outdoor education and green woodwork
7. Sustainable design
8. Health and safety
9. Emphasis on craft-based tasks

Table 1: Main Emphases in the Present Icelandic National Curriculum for D&C

Teachers' Pedagogy, Teaching Practices and Curriculum Knowledge

The term pedagogy refers to teachers' practices; it is a complex concept and not easily defined. Watkins and Mortimer (1999, p. 3) define pedagogy as 'any conscious activity by one person designed to enhance the learning of another'. Alexander (2003, p. 3), however, argues that pedagogy requires discourse: Pedagogy is the act of teaching together with its attendant discourse. It is what one needs to know, and the skills one needs to command in order to make and justify the many different kinds of decisions of which teaching is constituted. McNamara (1991, p. 3), Brown and McIntyre (1993), Black et al. (2002), Ireson, Mortimer & Hallam (1999), and Bruner (1999) argue that it is difficult to understand teachers' pedagogy and that there are many factors which affect practice. Teachers have to take more into account than the latest government thinking about how they should teach in the classroom. Their work may be influenced by many factors, such as the school environment, their position in the school, their experience of learning and their training.

Knowledge plays important roles in the teaching profession. It involves how teachers apply their knowledge to make decisions, for example, about lesson design or making on the spot judgements in the classroom. Curriculum knowledge, according to Shulman (1987), requires understanding children's learning abilities, national syllabuses, school planning documents and yearly group plans. In addition, any examination syllabuses must be considered along with local requests from the individual school.

Because no research had been carried out to determine the current status of D&C, this research project was concerned with examining teachers' use of the D&C curriculum. Therefore, it was relevant to study the congruency between the national curriculum and their teaching practices and to determine if they were aware of what should be taught to a particular group of pupils.

Over the past 20 years, the national curriculum for D&C has changed considerably in Iceland (Menntamalaraduneytid, 2007). The curriculum prescribe what shall be taught, but do not dictate which teaching methods should be used. However, the general part of the national curriculum (Menntamalaraduneytid, 2007) advises teachers to select appropriate teaching methods to meet pupils' needs in order to support their education and development. The curriculum underline the importance of meeting individual students' expectations and requirements to give them positive experiences and increase their interest in the subject so they gain pleasure from their work. The teaching must be based on equality, and the teacher has to avoid discrimination because of gender, residence, origin, race, disability, religion, sexual orientation or social status (Menntamalaraduneytid, 2007).

Common Teaching Methods for Teaching D&C

Initial craft education in Iceland was influenced by Swedish and Danish Sloyds. The Danish Sloyd was built on classroom instruction (Kananoja, 1989). Students were given exercises to train them in the use of tools. All classes began by making models using a saw. Files and sandpaper were forbidden because they could hide faults. Lesson plans had to be flexible to meet the varying needs of individual pupils. Woodwork was the only course offered because the school time allocated to Sloyd was very limited (Bennett, 1937).

Teaching methods used in Swedish Sloyd were well-organised (Bennett, 1926). The individual student became the centre of the system, and the facilitation of the holistic development of the student's capabilities was placed at the forefront of learning. The importance of teaching the fundamentals and building the skills of the student, from the very first stage of his or her education, were underlined (Herrera, 1999; Herrera & Yokoyama, 2002). The Swedish Sloyd system was based on individualised instructions adapted to the abilities of each student. Three fundamental points characterised this method: (1) the creation of useful objects, (2) the analysis of work processes, and (3) the teaching method employed (Bennett, 1926). The training system was structured around the transition from simple exercises to more complex ones. Following the exercises, students were required to build objects or models in a particular order (Thorbjornsson, 1990).

As time went by, the teaching methods became more varied and more individualised (Menntamalaraduneytid, 2007). There are now differing opinions about the value of using these methods. However, good teachers will be successful with any lesson plans, including direct instruction. According to the research, the following teaching methods are used by D&C teachers.

Direct instruction with or without discussion. Direct instruction is the most common type of instruction used by teachers. It relies on formal lesson plans and lectures and does not normally include activities such as discussion, recitation, seminars, workshops, case studies or internships. The role of the teacher during direct instruction is to organize and control the lesson as the expert. When using direct instruction, the teacher presents a general principle or rule that students must base their work on. Then, the teacher can see from the students' work if the principle has been applied.

Critics argue that direct instruction is nothing but canned teaching involving little personalization. Supporters of direct instruction consider it helpful in developing students' deductive reasoning and delivering large amounts of information in a timely manner. Moreover, as the method is teacher-directed, it lends itself to designing instruction that is developmentally appropriate to pupils' ages and stages (*Engelmann* & *Carnine, 1991*).

Discussion. Discussion methods are a variety of forums for an open-ended, collaborative exchange of ideas among a teacher and students or among students for the purpose of furthering students' thinking, learning, problem solving, understanding or literary appreciation. Participants present multiple points of view, respond to the ideas of others and reflect on their own ideas in an effort to build their knowledge, understanding or interpretation of the matter at hand. Discussions may occur among members of a dyad, small group, or whole class and be teacher-led or student-led. In D&C, discussion often focuses on the teacher's brief or a technical problem in order to help students to establish their design. Other terms for discussions used for pedagogical purposes are *instructional conversations* (Tharp & Gallimore, 1988) and *substantive conversations* (Newmann, 1990).

Workbooks. Workbooks are often used in D&C, especially for younger students. They are ideal because students can work directly in their books, both at school and at home. This can, for example, be descriptions and drawings of students' designs. Workbooks have an advantage because they are usually smaller and lighter than textbooks, which equates to less trouble when the students bring the book home to complete their design (Kerr, 1947).

Giving the brief with discussions. D&C teachers normally start their classes by giving students a brief or a design task. This often includes the use of written assignments that can be used to explore the background of the design and to make sketches later at home. Often, the teacher gives the students photocopies showing several drawings or photos of possible outcomes. Normally, this includes discussions between students and the teacher, in order to increase their understanding, and brainstorming sessions about possible designs (Menntamalaraduneytid, 1999).

Group work and collaborative learning. Collaborative learning is based on the view that knowledge is a social construct. Collaborative activities are most often based on four principles:

- The learner or student is the primary focus of the instruction.
- Interaction and *doing* are of primary importance.
- Working in groups is an important mode of learning.
- Structured approaches to developing solutions to real-world problems are incorporated into learning.

Collaborative learning can occur peer-to-peer or in larger groups. Peer learning, or peer instruction, is a type of collaborative learning that involves students working in pairs or small groups to discuss concepts or find solutions to problems. This often occurs in a class session after students are introduced to the design task or technical problem to be solved.

Group projects can help students develop a host of skills that are increasingly important in the professional world (Caruso & Woolley, 2008; Mannix & Neale, 2005). Positive group experiences, moreover, have been shown to contribute to student learning, retention and overall college success (Astin, 1993; National Survey of Student Engagement, 2006; Tinto, 1987).

Outdoor Education. Outdoor education in D&C describes school curriculum learning in a way other than with a class of students in a room with a teacher. Outdoor education spans the three domains of self, others and the natural world. The most common task in D&C is using local wood to whittle and to learn about how to maintain and utilise it for craft. It encompasses biology field trips and searching for insects in the school garden, as well as indoor activities such as observing stock control in a local shop or visiting a museum.

Despite evidence showing the benefits of outdoor learning, there are a number of obstacles in the way. One obstacle is risk aversion amongst teachers, parents and others, which raises reluctance to such diverse and physical tasks (Olafsson & Thorsteinsson, 2014).

Use of ICT. In recent years there has been an interest in how the use of computers and the Internet can best be harnessed to improve the efficiency and effectiveness of D&C education, both in formal and informal settings. The national curriculum underline the importance of teachers utilising this modern technology in all subjects (Menntamalaraduneytid, 2012) as it can support D&C students in many ways, such as using computer-aided design (CAD) for drawing and accessing information sources on the Internet that support students in their design work (Sigurgeirsson, 1999).

Earlier Research Projects on Teaching Methods and Classroom Settings

Very few earlier research projects have been carried out to examine teaching methods used in the D&C field. However, several research projects have been carried out in other areas.

The research project entitled *Teaching and Learning in the 21st Century* (Oskarsdottir, 2014) focused on teaching art and craft in the Icelandic elementary schools. The project was carried out from 2008 to 2013 in 20 Icelandic elementary schools. The research examined seven different art and craft subjects. Questionnaires were sent to 860 teachers, 2,100 students in grades 7–10 and to 5,000 parents. Subsequently, follow-up interviews were conducted with seven groups of teachers in seven schools. Moreover, the researchers did observations during 135 lessons.

The research concluded that 58% of the art and craft teachers were using the national curriculum to prepare their teaching for whole year, but 7% used it only a little or not at all. By comparing the art and craft teachers with teachers from other subjects, the researchers found out that the art and craft teachers were using the national curriculum less than other teachers, both in the context of their daily preparation and for preparing for each term or for the whole winter (Oskarsdottir et al., 2014).

The questionnaire included questions about teaching methods. The majority, 74%, used direct teaching with discussions on a daily basis or more often, 66% used lectures every day or more often and 65% used practical demonstrations on a daily basis or more often. A large percentage, 78%, never, or seldom, used computers during their lessons (Oskarsdottir et al., 2014). Multiple tasks were more common in art and craft than in other subjects, and the teachers considered these subjects more able to meet individual students' needs than other subjects (Oskarsdottir et al., 2014).

In Thorsteinsson and Olafsson's (2011) research on design decisions in D&C inside the Icelandic elementary schools, they found that some teachers held the view that, as students' progress, they should be given more decision-making opportunities. However, most of the teachers did not offer any kind of formal instruction on decision-making techniques to their students as a part of their teaching methods. According to the teachers, the majority of students rarely searched for information outside of the classroom before taking their design decisions. The main source of information for the students was their teacher, and on some occasions, they used the Internet as an information source for making their design decisions (Thorsteinsson & Olafsson, 2011). The study concluded that the national curriculum in Iceland include many opportunities for decision-making in D&C education. However, many teachers indicated that some of the requirements of the curriculum were not achievable, and they therefore selected the goals and aims they found feasible to attain (Thorsteinsson & Olafsson, 2011).

In his research from 1987–1988, Sigurgeirsson (1998) analysed extensive data from 20 primary classrooms. The research showed that traditional teaching methods and classroom setup dominated. This appeared in passive individual seatwork, rote-learning, recitation, drill and various forms of textbook teaching. A follow-up survey, several years later with teachers in 80 additional schools, gave similar results (Sigurgeirsson, 1992). In 1994, Sigurgeirsson interviewed 200 head teachers from Icelandic elementary schools. The results also showed that traditional teaching methods dominated.

Jonsdottir's (2003) research showed that traditional teaching methods were dominating in the elementary school youth level. However, at the same time, the schools aimed at individualised teaching. Nevertheless, just 27% of the teachers in theoretical subjects based their class activities on individualised teaching. At the same time, 50% of teachers in the areas of art and craft focused on

individualised teaching. The art and craft teachers encouraged their students to make their own decisions more often than teachers of theoretical subjects did.

Similarly, Karlsson's (2009) research on teaching methods in Icelandic and Finnish schools concluded that traditional teaching methods dominated in Icelandic schools. The classrooms were, for example, set up in the traditional manner to teach groups, and this limited the students' freedom and independence. Little flexibility was given for individual work, and students were working on the same projects. Karlsson (2009), however, concluded that Icelandic teachers have to use various teaching methods in order to support the ideology of individualised learning. Birgisdottir's (2004) research in the elementary schools concluded that teachers, in general, believed they were using traditional methods for teaching classes, but thought their classroom settings were flexible for students. Her research also showed that teachers of younger students were focused more on individual differences.

In Sigurgeirsson and Kaldalons (2006) research on discipline problems in Reykjavik schools, three of the interviewees stated that the art and craft subjects were important support for problematic students and that they should have a greater weight inside the elementary schools. One school administrator stated that discipline problems decreased significantly when students were given more time in art and craft classes.

The Research Methodology

The aim of the survey was to examine the present situation in Icelandic D&C in terms of the teachers' general standing and their teaching inside the Icelandic elementary schools. The research questions were the following:

1. What are the most common methods for teaching D&C?
2. How do D&C teachers utilise the Icelandic National Curriculum?
3. How *could D&C teachers better meet students' individual needs?*

The research was undertaken in the autumn of 2014. Data were collected by an online questionnaire using the entire population of D&C teachers in Iceland (Cohen, Manion, & Morrison, 2005).

An online questionnaire was designed on the basis of the Icelandic National Curriculum for D&C. LimeSurvey, a web-based survey tool, was used to conduct the survey. It allowed the authors to create the online questionnaire and give respondents access to it via email and to then export the results which were subsequently analysed using the Statistical Package for Social Sciences software (SPSS, Chicago, IL, USA). The survey was anonymous and untraceable.

A survey has several unique characteristics and represents several advantages. Typically, a survey is used to scan a wide field of issues in order to measure or describe any generalized features. It usually relies on large scale data gathered from a wide population, which can then be processed statistically in order to enable generalizations to be made about given factors or variables (Cohen et al., 2005). According to Morrison (1993, pp. 38–40) a survey normally gathers data on a one-shot basis and is therefore economical and efficient. It represents a wide target population, generates numerical data, provides descriptive, inferential and explanatory information, manipulates key

factors and variables to derive frequencies and gathers standardized information (Bryman & Bell, 2007).

The questionnaire served four basic purposes: to (1) collect the appropriate data, (2) make data comparable and amenable to analysis, (3) minimize bias in formulating and asking questions and (4) make questions engaging and varied.

The questionnaire included 28 questions and was sent to 170 elementary schools. The questions were designed to extract general and specific information about teaching D&C. The specific questions concerned the following:

- Teaching methods,
- School curriculum,
- Teachers' backgrounds, and
- How teachers' want to improve their work.

The response rate was 59.4%, as 101 teachers responded to the questionnaire. A numerical analysis was performed using the SPSS software, which provided total averages, median, standard deviation and averages for different classes of questions.

According to Icelandic law, the survey was reported to Personuvernd, the Icelandic Data Protection Authority (Personuvernd, 2011). No personal information was collected in the survey, and it was not possible to connect responses with specific individuals.

Results of the Survey

None of the participants who answered the questionnaire were younger than 30 years of age, and only 17% were from 30–39 years of age as seen in Figure 3. About half of the teachers were located at schools in the capital area, and the other half were located at schools in rural areas.

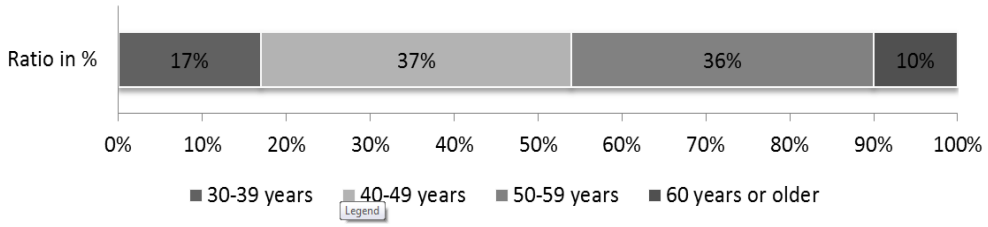

Figure 3: Age of participants.

The majority of the participants (39%) were professional D&C teachers, as shown in Table 2. Of the teachers, 19% had vocational backgrounds with a teaching licence, and 14% had general teacher education qualifications without being professional D&C teachers. Of the total, 40% of the teachers taught only D&C, and 60% taught additional subjects.

Table 2: Participants' Education

Education	Percentage
B.Ed. specialised in D&C	39%
B.Ed. specialised in other subjects	14%
Vocational training with teaching licence	19%
Vocational training without teaching licence	5%
Other education with teaching licence	6%
In university	1%
Other education	16%
Total	**100%**

Table 3: Period of Employment in Teaching

Years of teaching	Percentage
In first year	2%
1–5	18%
6–10	25%
11–15	20%
16–20	12%
21–30	14%
30–40	8%
40 or more	1%
Total	100%

The national curriculum states how much time each subject is allotted. According to the 2007 National Curriculum (Menntamalaraduneytid, 2007), D&C is to be taught from first through eighth grades. It is not compulsory to teach D&C in ninth and tenth grades, but some schools chose to use unallocated hours for subjects within art and craft. Of the survey participants, 60% stated that D&C was an elective subject in eighth grade, 80% in ninth grade and 79% in tenth grade (Table 4).

Table 4: Grades That Were Not Given D&C Lessons

Class	Percentage
1	24%
2	8%
3	3%
4	2%
5	1%
6	1%
7	1%
8	6%

9	12%
10	14%

According to the national curriculum (2015), all teachers are obliged to follow the national curriculum, and schools are further obliged to create specific school curriculums for each subject based on the national curriculum. Of the participants, 3% stated that they did not use the school curriculum to prepare for teaching. However, 74% of the participants used the school curriculum in the autumn when preparing for the whole winter, 47% used it in the beginning of each school term, 13% used it every week or every month and 7% used it for daily preparation.

When the teachers were asked about their teaching practices, 64% stated that they were encouraged by school administrators to use various teaching methods. As seen in Table 5, the most common teaching methods were direct teaching with discussions with students and direct teaching with the teacher assigning tasks and giving direct information to the students. Only 12% of the participants used workbooks on a daily basis, and 28% never used textbooks. Of the participants, 29% never utilised student computers during their lessons.

Table 5: Teaching Methods

	Daily	**1 - 4 times a week**	**Fewer than 3 times a month**	**Never**
Direct teaching for all students	52%	31%	16%	1%
Direct teaching with discussions	62%	24%	13%	1%
Workbooks	12%	12%	48%	28%
Other written tasks	6%	13%	55%	26%
Group work in classes	21%	22%	52%	5%
Discussions in groups and oral presentations	8%	18%	55%	5%
Outdoor education and field trips	0%	6%	74%	20%
Students use of computers	6%	11%	54%	29%

There was a correlation between the participant's educational background and whether he or she used written tasks. Of the participants, 66.7% of those who had a B.Ed. degree and were professional D&C teachers sometimes used written tasks, while 35.7% of those who had a B.Ed. degree without specialisation in D&C used written tasks ($\chi 2$ [36, N = 100] = 55.1, $p < 0.05$).

The participant's answers to the question as to whether or not they wanted to use the listed teaching methods, and to what degree, are shown in Table 6. Most of the participants wanted to do more outdoor education (51%) and use computers more (49%).

Table 6: Teaching Methods

	Use more	Same as present	Use less	Do not know
Direct teaching for all students	10%	81%	5%	3%
Direct teaching with discussions	14%	78%	5%	2%
Workbooks	20%	51%	14%	14%
Other written projects	20%	47%	16%	16%
Group work in classes	29%	57%	7%	6%
Discussions in groups and oral presentations	41%	45%	5%	8%
Outdoor education and field trips	51%	33%	4%	11%
Using computers	49%	35%	3%	12%

Of the participants, 83% stated that students were very often or always given individually-based tasks. Only 11% stated that students were seldom or never given individually-based tasks. Of the participants, 58% said that students were almost always permitted to make their own designs and that 29% were very often permitted to make their own designs. Only 6% of participants expressed that their students could almost always make their own design choice, and 27% said they were very often able to make their own design choice.

There was a correlation between the participant's education and whether students were allowed to make their own design decisions. Of those who had a B.Ed. degree and were professional D&C teachers, 69.2% stated that students were almost always allowed to make their own design decisions, as did 57.1% of those who had a B.Ed. degree without a specialisation in D&C and 42.1% of those who had vocational training with a teaching licence ($\chi 2$ [37, N = 100] = 24.1, $p < 0.05$).

Participants were also asked about their attitude towards students' behaviour. Half (50%) of the teachers agreed that students with attitude problems should get more time in art and craft, 25% did not agree and 25% did not answer. However, 86% of the teachers considered D&C helpful, particularly helpful for students with learning difficulties, and felt that students should receive more time in D&C.

Participants were asked what could help them to better meet the needs of individual students. As seen in Table 7, 72.2% stated that an assistant in the classroom would be somewhat or very much helpful, 71.1% considered smaller classes would be somewhat or very much helpful and

77.3% believed that better equipment and technical inventory would be somewhat or very much helpful. Only 32.9% stated that more flexibility would be somewhat or very much helpful, and 35.1% felt that that advice from experts would be somewhat or very much helpful.

Table 7: What Would Be Helpful in Meeting the Needs of Individual Students?

	Somewhat or very much	**Neutral**	**Not much or very little**
Extra assistant in class	72.2%	15.4%	12.4%
More time for preparation	62.9%	30.9%	6.2%
Smaller classes	71.1%	18.6%	10.3%
Advice from experts in preparation	35.1%	36.1%	28.8%
Courses in new teaching methods	59.8%	28.8%	11.4%
More encouragement from leaders	31.9%	50.5%	17.6%
More flexible timetable and possibilities for longer hours	32.9%	39.2%	27.8%
More equipment and technical inventory	77.3%	17.5%	5.1%
Increased cooperation with other teachers	56.7%	34%	9.3%

There was a correlation between the participants' education and their answers to the questions about what would help teachers meet the needs of individual students. Of the professional D&C teachers, 48.7% stated that smaller classes would help them, but only 35.7% of those who were qualified teachers but not specialised in D&C agreed about smaller classes, while 36.8% of those who had vocational training with a teaching licence agreed ($\chi 2$ [55, N = 100] = 37.1, $p < 0.01$).

Discussion and Conclusion

The Icelandic National Curriculum for D&C does not define how teachers should teach, nor does it recommend the use of certain teaching methods. Nevertheless, the general part of the national curriculum (Menntamalaraduneytid, 2012) advises teachers to select advantageous teaching methods to support the development of individual students. This means that the teachers' work depends on their professionalism and ability to use various teaching methods to meet different needs of students.

When teachers were asked about teaching practices, the majority stated they were encouraged by school administrators to use various teaching methods to meet the demands of the

national curriculum. Nevertheless, earlier research projects showed that most of the teachers used traditional, old-fashioned teaching methods, such as direct instruction (Birgisdottir, 2004; Jonsdottir, 2003; Karlsson, 2009; Sigurgeirsson, 1998, 1992; Sigurgeirsson & Kaldalons, 2006). As Oskarsdottir's (2014) research concluded, very few of the teachers used computers for students, went on field trips or were involved in outdoor educational activities. However, many of the teachers were interested in using computers in support of ideation. Most probably, they were interested in diversifying their teaching to meet the national curriculum's new requirement of increasing students' ICT skills by using computers in all subjects (Menntamalaraduneytid, 2012).

It was found that teachers and students were not using textbooks a great deal in order to allow students to determine their own tasks because most of the teachers considered it better to select suitable projects for students' on different levels. Moreover, general D&C is based on hands-on work supported mutually by instructions and demonstrations, and the common textbook, by its nature, is not seen as supportive for students. Furthermore, the fundamental ideology behind the subject is to support students' development using handicraft in general education; therefore, it might be more effective to focus more on handicraft activities than on planning and students' ideation (Mikkelsen, 1891; Thorarinsson, 1891; Thorsteinsson & Olafsson, 2009).

The majority of the participants were professional D&C teachers who became used to certain teaching methods as students during their own education in the subject area. Consequently, their work was affected by their earlier experiences as students.

All of the teachers were more than 30 years of age, and 17% were from 30–39 years of age. This could possibly have affected their interest for using certain methods in their teaching; perhaps, their teacher training was different from that of younger teachers. There might also have been differences between teachers located at schools in the capital area and those in rural areas because of closeness to the economy live in the rural areas.

Some of the teachers wanted to focus more on group work. D&C education in Iceland is more individual-based than in most other subjects and, therefore, better equipped to meet the curriculum's demand for supporting the development of individual students by using appropriate teaching methods (Menntamalaraduneytid, 2012).

Many of the teachers were more interested in outdoor education, field trips and the use of computers as these are new emphases in the national curriculum for D&C. Yet, it is probable there is a lack of time to engage in these, or perhaps teachers do not have the opportunity or facilities to currently support such activities.

The national curriculum dictates (Menntamalaraduneytid, 2012) how much time each subject is given. However, according to the survey, classes 1–2 and 9–10 get fewer D&C lessons than other classes. This might affect the selection of teaching methods in some of the schools as students have weaker skills and knowledge if they start later, say in class 3, and therefore receive a more basic teaching. If students are taught earlier, they become more skilled and more capable of working individually, which also means they are more capable of making their own design decisions.

All teachers are obliged to follow the national curriculum when planning the school term. Moreover, schools are obliged to develop a school curriculum for each subject based on the national curriculum. Most of the participants used the national curriculum when preparing for the whole year, but some used it when planning each school term. This means that most of D&C teaching is based on the national curriculum. However, Oskarsdottir et al.'s research (2014) showed that art and craft teachers used the national curriculum less when preparing for the school term than teachers of

other subjects. This could indicate that D&C teachers base their teaching more on their own experience and skill. Thorsteinsson and Olafsson's research (2011), moreover, shows that D&C teachers are not all content with the demands of the national curriculum as they think that the time is too limited to fulfil its requirements for individual learning and that it is better to use the time for augmenting students' skills and knowledge.

Most of the teachers had been teaching for six or more years. Because of their long experience, they had probably already established their way of working. Also, some of the teaching methods they were asked about are more appropriate for teaching theoretical subjects rather than craft and would thus reduce students' handout work in lessons. For example, only 12% of the teachers used workbooks daily. Sigurgeirsson's (1998) research found traditional didactics were overwhelmingly dominated by passive individual seatwork and various forms of textbook teaching. However, the nature of the more practical subjects can demand other types of teaching methods.

There was a correlation between participants' educational backgrounds and whether they gave students written tasks. The majority (66.7%) who had a B.Ed. degree and were professional D&C teachers sometimes used written tasks, while some (35.7%) of the teachers who had a B.Ed. degree without specialisation in D&C used written tasks. Educated D&C teachers gain training and knowledge in D&C didactics in their teacher education. Therefore, they should be able to base their practices on their didactic knowledge. They should also be able to reflect on their own teaching experiences and analyse their successes and failures when attempting to teach. They should, moreover, be able to examine the conceptions and assumptions implicit in their teaching and consciously develop their own theories of education though the analysis, evaluation and reconstruction of their understanding of teaching the subject and what it means to learn D&C (Thorsteinsson and Olafsson, 2015).

Teacher education in D&C is important as, most likely, it supports teachers' understanding and ability to use handicraft as a systematic method for teaching and learning. This also gives teachers the ability to gain a deeper understanding in teaching their subject by connecting handout activities and theoretical knowledge when teaching D&C.

Most (83%) of the participants stated that students were working with individualised projects always or very often, and a small number (11%) stated that students seldom or never were given individual tasks. The importance of individualised learning was underlined in the beginning of D&C education in Iceland (Thorarinsson, 1891) and is still practiced in schools. The initiators of the pedagogy for using craft as a teaching method in public education also recommended this teaching method to enable students' individualised learning. Today, D&C is still used to support individual development, which is the main aim of teaching the subject (Thorsteinsson and Olafsson, 2015).

The D&C possibilities and methods for individualised learning could be supportive in general education, and they could serve as guides for many other subjects taught via general education in Iceland. Karlsson's (2009) research on teaching methods in Iceland concluded that traditional teaching methods are dominant in Icelandic schools. The classrooms are, for example, set up in a traditional manner to teach groups, and that limits students' freedom and independence. Little flexibility is given for individual work, and students work on the same projects. Karlsson (2009) believes that Icelandic teachers have to use various teaching methods to support the ideology concerning individualised learning. Jonsdottir's (2003) research also showed that traditional teaching methods were dominating in the elementary school youth level; however, at the same time, the schools focused on individualised teaching. Nevertheless, just 27% of teachers in theoretical subjects

based their class activities on individualised teaching. At the same time, 50% of teachers in the area of art and craft were focused on individualised teaching. The art and craft teachers encouraged their students to make their own decisions more than teachers of theoretical subjects did. Birgisdóttir's (2004) research found out that teachers, in general, believed they were using traditional methods for teaching classes. However, teachers in art and craft used traditional methods more, and teachers of younger students were more focused on individual differences.

The teachers' background and education were important in the context of students making their design decisions. There was a correlation between a participant's education and whether students were allowed to make their own design choices. Teachers who had a B.Ed. degree stated that students were almost always allowed to make their own designs, but fewer were able to in classes of those who had a vocational training background and a teaching licence. In Thorsteinsson and Olafsson's (2011) research on design decisions in D&C in elementary schools, they found that teachers held the view that children should be given more decision-making opportunities as they progress. However, most of the teachers did not offer any kind of formal instruction on decision-making techniques. According to the nature of the study, it was concluded that the national curriculum for D&C in Iceland includes many opportunities for independent decision-making (Thorsteinsson & Olafsson, 2011).

The participants were asked about their attitude toward students' behaviour. Half of the teachers were in agreement with the statement that students with attitude problems should receive more time in art and craft classes. Most of the teachers also stated that D&C was helpful for students with learning difficulties. This is in accordance with Sigurgeirsson and Kaldalons (2006) research in Reykjavik schools that stressed that art and craft subjects were important for students with discipline problems and that it should be given more space in the schools' timetables.

Answering the research questions

To clarify the outcome of the study the authors attempted to encapsulate the answers to the research questions set out at the beginning of the survey, in the light of the research results and the discussions and conclusions above.

1. *What are the most common methods for teaching D&C?*

The teachers used mostly traditional teaching methods in order to fulfil the aims of the national curriculum. The most common teaching methods were; direct teaching for all students, direct teaching with discussions and group work in classes. Nevertheless, some of them had included outdoor education and ICT in their teaching to meet the demands of the latest national curricula and to support ideation. Lack of time and facilities limited teacher's possibilities to use different teaching methods.

2. *How do D&C teachers utilise the Icelandic National Curriculum?*

Most of the teachers were using the national curriculum when planning the school term. This included mainly, selection of teaching methods, flexibility for individual learning, student's freedom of making design decisions and different undertakings. Consequently, the D&C teaching in

schools is generally based on the national curriculum. 3% of the teachers stated they were not using the school curriculum to prepare for teaching.

3. How *could D&C teachers better meet students' individual needs?*

83% of the teachers based their teaching always or very often on student's individual needs. This is in agreement with the initial pedagogy of the D&C subject and the aims of the present national curricula. However, teachers of younger students were more focused on individual differences. Teachers with a B.Ed. degree gave students more often flexibility to make their own design decisions than teachers with vocational training background. Most of the teachers also stated that D&C was helpful for students with learning difficulties.

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