STUDENT'S ATTITUDES TOWARDS CRAFT AND TECHNOLOGY IN ICELAND AND FINLAND

By

GISLI THORSTEINSSON * BRYNJAR OLAFSSON ** OSSI AUTIO ***

* Associate Professor, University of Iceland.
** Adjunction Design and Craftin, University of Iceland.
*** Senior Lecturer, University of Helsinki.

ABSTRACT

Craft education in both Finland and Iceland originated over 140 years ago and was influenced by the Scandinavian Sloyd pedagogy. Since then, the subject has moved away from craft and towards technology, with the aim being to increase students' technological abilities. In the beginning, the subject largely focused on the students copying artefacts, using a variety of handicraft tools: the purpose of this was to improve pupils' manual skills, rather than their thinking skills. Today, however, the focus is also on the development of students' thinking skills, which enables them to work through the various handicraft processes (from initial ideas to the final product). This work is based on the idea generation of students and is thus expected to increase their self-esteem and ingenuity.

This paper is based on a comparative study of students' attitudes towards craft and technology education in Finland and Iceland, which was undertaken by the University of Iceland and Helsinki University in the years 2011 and 2012. A quantitative survey was distributed to 213 school students and it consisted of 14 questions, which aimed to ascertain students' attitudes towards craft and technology. A literature review was subsequently completed, in order to examine and compare the origins of craft education in Finland and Iceland. The review highlighted that, despite the origins of craft education in Finland and Iceland being similar, the Icelandic national curriculum placed greater emphasis on design and innovation, whereas the Finnish national curriculum focused on the development of students' personalities and gender issues. The survey also showed differences in students' attitudes towards craft and technology education in the two countries: these differences may be explained by differences in the national curriculums and the different pedagogical traditions. However, this finding needs to be examined further through research.

Keywords: Survey, Attitude, National Curriculum, Literature Search, Pedagogical Traditions, Technology Education, Craft.

INTRODUCTION

A quantitative survey was distributed in Finnish and Icelandic compulsory schools and n=213 students, from the ages of 7-16, completed the survey, in which they were asked about their attitudes towards craft and technology. 87 students participated in Iceland and 126 in Finland. A literature review was also completed to explore the curriculum and to ascertain how the subjects of Craft and Technology were practiced in schools. The survey showed difference in students' attitudes towards craft and technology education in Finland and Iceland, while the literature review indicated that there were few differences between the Finnish and Icelandic curriculums and how the subjects were taught in schools.

Compulsory education in Finland is intended for students from 7 to 16 years old. In addition, all 6 year olds are entitled to pre-school education for one year, prior to starting basic education. Primary school teachers teach students aged 7 to 13 years old (grades 1-6), while specialist teachers teach children aged 13 to 16 years old (grades 7-9). Secondary schools educate students aged 16 -19 years and these schools are divided into general education (upper secondary schools) and vocational education (vocational schools). Upper secondary schools prepare students for higher education, while vocational schools instruct students for specialised vocational training (Lavonen & Autio, 2003).

The general aim of Finnish craft education is to increase

students' self-esteem by developing their skills through enjoyable craft activities; it also aims to increase students' understanding of the various manufacturing processes and the use of different materials in craft. Furthermore, the subject aims to encourage students to make their own decisions in designing, allowing them to assess their ideas and products. Students' practical work is product orientated and based on experimentation, in accordance with the development of their personality. The role of the teacher is to guide students' work in a systematic manner. They must encourage pupils' independence, the growth of their creative skills through problem-based learning and the development of technical literacy. Finnish handicraft traditions are also of importance throughout the whole curriculum (Framework Curriculum Guidelines, 2004).

There are four levels of education in Iceland: playschool, compulsory school, upper secondary school and higher education (this is similar to the educational systems in other Nordic countries). Education in Iceland is mandatory for children aged 6–16 and is organised into a single, structured system; i.e., primary and lower secondary education are both part of the same school level and are generally housed within the same school. Upper secondary education (aged 16-20 years) is not compulsory, but anyone who has completed compulsory education has a right to study at this level. Upper secondary schools offer both general academic studies and vocational training. General academic studies are of four-years' duration, leading to a matriculation examination, while the length of vocational courses varies: they may last from one semester to ten semesters; the four-year courses are most prevalent (The Icelandic Ministry of Education, 2007).

The present national curriculum for the subject of Craft in Iceland places an emphasis on individual-based learning. It also gives teachers the freedom to run an independent curriculum in school, which is based on the national curriculum. As in Finland, the subject is product based and students learn via traditional craft activities. Students' work is based on craft tradition rather than technology; however, innovation and idea generation are an important part of the Icelandic curriculum. There are also the aims of developing students' manual skills, instructing them in the manufacturing processes and training them to organise their own work. The national curriculum also incorporates outdoor education, working with green wood and sustainable design (Olafsson & Thorsteinsson, 2010).

Thus, as seen above, there are many similarities between the national curriculums in Finland and Iceland; however there are also some differences. In the following sections, the authors will attempt to highlight these differences and will try to ascertain whether there are any differences in the two countries, with regards to students' attitudes towards craft and technology.

Part of the study was to recognise the origin of craft education in Finland and Iceland and to identify fundamental changes during the curriculums development. The empirical part of the study was, however, to find any differences in students' attitudes towards craft and technology in Finland and Iceland. The research questions were

- What are the origins of craft education in Finland and Iceland?
- How have the curriculums developed over the years?
- What do craft education in Finland and Iceland have in common?
- Are there differences in students' attitudes towards Craft and Technology in Finland and Iceland?

The Beginning of Pedagogical Craft Education

The education of handicrafts became a part of general education in central Europe in the seventeenth century and the main reason for this was the founding of general educational systems and the beginning of industrialisation. New methods for manufacturing and production demanded new skills from citizens (Kantola, Nikkanen, Kari, & Kananoja, 1999) and thus teaching began to focus on practical skills and the necessary technology found within society (Kanonoja, 1989). The course content was based on the use of materials and the development of skills for the production of useful artefacts. Students learnt how to 'work according to rules' and gained the various skills required for their working lives. Handicraft education brought together care and perseverance, with the aim of the growth of

students' personalities.

Pedagogically, craft education was established at the same time as the school-based system of formative education, under the term Sloyd. Sloyd originally meant handy or skilful and referred to the making of crafts (Chessin, 2007). However, in relation to education, Sloyd refers to discussions amongst philosophers, with regards to the pedagogical value of craft within general education (Borg, 2006). The purpose of Sloyd was to incorporate craft as a tool for general education, in order to build the character of students, encourage moral behaviour and increase intelligence and industriousness (Thorarinsson, 1891).

Uno Cygnaeus (1810-1888) (Finland) and Otto Salomon (1849-1907) (Sweden) were major leaders in the development of a systematic Sloyd model for school education: they emphasised the advantage of constructing objects through formal educational methodology (Kantola, 1999). Soon after, Cygnaeus began to teach Sloyd in Finnish schools and the Sloyd pedagogy was also adopted in Sweden, where the didactics of Sloyd education were further developed by Salomon between 1849-1907 (as a holistic system focusing on methods with which students could produce useful artefacts). In 1875, Salomon opened a Sloyd school in Nääs, which became a world training centre for Sloyd teachers (Alamäki, 1999). The Sloyd model was later disseminated by Salomon, as a result of the thousands of teachers from all over the world who attended his classes. Sloyd had a significant impact on the early development of manual training, manual arts, industrial education and technical education in many countries (Bennet, 1926).

The Development of the Craft Curriculum in Finland

The Finnish educationalist Cygnaeus (1810-1888) founded public schools in Finland in 1866 (Kananoja, 1989). At this time, Cygnaeus also introduced craft as a pedagogically-based compulsory subject, in an attempt to improve general education in Finland (Thorarinsson, 1891). In 1866, educational Sloyd (known as craft education today) became a compulsory subject in Finland (Kantola, 1997).

Manual training in Finland was established in two ways: males in rural communities were required to take the programme and teaching centres had to offer related courses (Vaughn & Mays, 1924). With the implementation of this system of universal education for all citizens, Finland became the first nation to make handwork an integral part of a national scheme of elementary education (Bennett, 1926; Kananoja, 1989 & Kantola, 1997).

Cygnaeus drew a sharp distinction between handicraft or manual arts as part of the general curriculum and handicraft as part of a technical or specialised education (Kananoja, 1989). Furthermore, he insisted that handicrafts should be taught by regular teachers, rather than specialised craftsmen (Bennett, 1937). Unfortunately, Cygnaeus' ideas for teaching craft were not adopted. In the Committee Report of 1912, the aims of teaching handiwork were based on the ideas of Mikael Soininen, who stated that craft education should be based on the general aims of handicraft training. These aims were in practice until the 1970s (Anttila, 1983).

Industrialisation in Finland occurred between the years 1920–1960 and, at the same time, the craft national curriculum began to focus on industrial skills, as such skills were required in society (Kananoja, 1989); little emphasis was placed on the development of students' personalities and the enjoyment of craft work. However, the policy of fulfilling the needs of an industrialised society did not last long. In the Committee Report of 1970, it was claimed that craft education was outdated and, influenced by the Norwegian 'Forming' model, the education authorities decided to make craft part of the subject area for art. The Committee Report also emphasised the importance of sexual equality for the first time: it was considered that craft education could develop the important skills needed for everyday life in both sexes. At this time, the name of the subject was changed from craft education to technical craft or textile craft and it was recommended that the number of lessons taught should be considerably decreased. However, these plans never came to full fruition, as the result of a protest by the society of craft teachers. Thus, the impact of the Committee Report, in terms of how the subject was taught in schools, was of little significance.

Technology Education was first introduced in the

Framework Curriculum Guidelines in 1985, yet its impact on the subject of craft was insignificant. Handicraft skills were still considered of great importance; however, electronics and engineering were incorporated into the subject. The authorities wanted to further develop technology education, but, in practice, this was difficult. They also wanted to preserve the link to the heritage of Finnish craft and support student equality.

In the 1994 Framework Curriculum Guidelines, it was asserted that technology was an important aspect of the development of a modern Finnish society. Sustainability was also introduced into the curriculum. However, technology education was not established as a specific subject and the technological aspect of craft education was not particularly supported. The importance of developing technical literacy in students was emphasised, in order to enable students to adapt to new circumstances and take part in the development of new technologies within a modern Finnish society. It was deemed that students of both sexes should benefit from familiarity with modern technology.

Around 2001, a discussion took place between the authorities and the spokesmen of the craft industry, with regards to the importance of incorporating technology education as an active part of general education in Finland. Unfortunately, these assertions were not taken into account in the Framework Curriculum Guidelines of 2004, with technology merely mentioned in the craft curriculum. Compared to the previous curriculum, few changes were made. The importance of developing students' handicraft skills was underlined, as in the Committee Report of 1970, within the context of the complete process of handiwork. Nevertheless, technology was introduced as part of a specific cross-curricular theme, entitled The Human Being and Technology. In addition, the development of students' personalities and the growth of self-esteem were also emphasised.

The Development of the Craft Curriculum in Iceland

The originators of pedagogical craft education in Iceland introduced the ideology of Scandinavian Sloyd to Icelandic educators around 1900. Consequently, their work provided the basis for the establishment of school laws, in terms of general craft education and curriculum development.

The first public school laws were established in Iceland's parliament in 1907 ; however, ideas for craft education were not included in this. The possible reasons for this were a lack of school buildings and facilities, a lack of interest on the part of the authorities and the importance of children working in the economy.

The first National Curriculum for the Education of Children was published in 1929 and this outlined seven years of school education for children living in urban areas and four years of education for children residing in rural areas. The craft industry was still not mentioned in the curriculum, although drawing was recommended as a subject (Eliasson, 1944). Despite this, craft was taught in several schools that had the necessary facilities.

Craft was first established as a subject in 1948. Instruction was gender-based, with craft for boys and textiles for girls (Fræðslumálastjórnin, 1948). The first integral national curriculum for compulsory education was published in 1960: this was gender-divided, but emphasised the general pedagogical values of the subject.

Based on the above law, a new national curriculum was established in 1976-1977 (The Icelandic Ministry of Education, 1977). In this curriculum, craft education was incorporated as a new subject area, entitled Art and Handicraft; this included art, textiles and craft. For the first time, all these subjects were compulsory for both boys and girls, with the curriculum being slightly revised in 1989.

In 1999, Craft was re-established as a technological subject, under the heading of Design and Craft (The Icelandic Ministry of Education, 1999): this new subject was based on a rationale of technological literacy, innovation and design (Thorsteinsson, 2002; Thorsteinsson & Denton, 2003). The curriculum was ambitious and made significant strides towards the education of technology. However, many teachers felt this was a step too far and felt uncomfortable utilising electronics in lessons. They lacked sufficient knowledge, skills and interest, with regards to the teaching of technology (olafasson, Hilmarsson & Svavarsser, 2005).

When the national curriculum was revised in 2007, the

education authority decided to seek suggestions from the Design and Craft Teachers' Association, in terms of the teaching of Design and Craft. Taking the teachers' views into account, it was decided to minimise the technological part of the Design and Craft curriculum and the original Sloyd values were once again included in the curriculum .The curriculum moved away from the manufacturing process (i.e., mass production) and towards handicraft-based processes. Today, innovation and idea generation are still an important part of the curriculum (Olafsson & Thorsteinsson, 2010), as is encouraging students to organise their work. New aspects of the curriculum are outdoor education, green woodwork, sustainable design and health and safety. Teachers have gained increased freedom, in terms of following the school curriculum and managing their teaching, as there are no longer any aims listed each year.

Comparing the National Curriculums of Finland and Iceland

Craft education in Finland and Iceland originated from the influence of the Scandinavian Sloyd pedagogy and thus the two curriculums share many similarities. Both the Finnish and Icelandic curriculums have emphasised the importance of maintaining the original pedagogical value of handicraft work as the foundation of craft subjects.

In Finland, pedagogical Sloyd became a compulsory school subject within the curriculum, known as craft education, in 1866. However, in Iceland, craft education was introduced at the beginning of 1900 and only received a mandatory status much later, in 1936; it became a compulsory subject in 1948. Since then, the subject in both countries has taken a similar direction; i.e., the general development of a child through a pedagogical system of manual training, the opportunity for students to make their own decisions in designing, innovation, technological literacy and gender equality (Table 1).

There are also some minor differences between the subjects in the two countries. For example, Iceland has recently placed an emphasis on design and innovation, while the Finnish curriculum has chosen to focus on the development of students' personalities and gender differences (Table 1).

Finland	Iceland
1866 Statute of folk school -Craft became compulsory school subject	1900 Rationale for Handicraft -The subject named Home Industry
1912 Committee Report -educational background for craft revised-focus on manual skills	1936 Laws for Child Education -craft education received a mandatory status
1952 Committee Report -focus on industrial skills -emphasis on using machines	1948 Draft for National Curriculum -craft formally established as a subject -technology introduced via projects
1970 Committee Report -craft introduced as education for work -pedagogical background (subject matter) -sexual equality emphasised	1960 National Curriculum -general pedagogical values underlined as an important part of craft education
1985 Framework Curriculum Guidelines -concept of technology introduced -craft cultural heritage made important	1977 National Curriculum -art, textiles and craft under the same subject area -craft became compulsory for boys and girls
1994 Framework Curriculum Guidelines -gender equality emphasised -sustainability became part of the curriculum	1989 National Curriculum -the curriculum revised from 1977
2004 Framework Curriculum Guidelines - students' personality development deemed important -enjoyment in doing craftwork and self-esteem deemed important	1999 National Curriculum -craft named design and craft -new area established for technology and ICT -craft became a technological based subject -innovation and design emphasised
	2007 National Curriculum -craft again emphasised -outdoor education, sustainable design

Table 1. Shows the Main Changes in the National Curriculums for Craft in Finland and Iceland over the Years

The main changes throughout the development of the two curriculums are presented in the following table.

Empirical Research

The aim of the empirical aspect of the research was to answer the question: Is there a difference in students' attitudes towards craft and technology in Finland and Iceland? 213 students took part in the survey, 87 in Iceland and 126 in Finland. Dyrenfurth (1990) and Layton (1994) referred to attitudes to technology education using the concept of 'technological will'. According to these authors, technology is determined and guided by human emotions, motivation, values and personal qualities. Thus, the development of technology is dependent on the students' will to take part in lessons and on the impact of their technological decisions.

In order to evaluate students' attitudes towards craft and technology in Finland and Iceland, a questionnaire was

devised, consisting of 14 questions. The first part of the questionnaire refers to technology. Students are asked about students interest for technology, how much time they spend in technological based activities, it they read about technology, if they understand the value of technology evolution for the future, if they understand the technology is for both boys and girls, if they want to have a future job based on technological skill and knowledge, if their parents are keen at technology. The second part of the questionnaire refers to context of craft education. Students are asked if they like craft, if it is amusing and relaxing, if craft gives them more skills in working with their hands, if craft education improves their logical thinking, if they have been successful in craft classes and if they consider craft education a valuable preparation for their future.

For each Likert-type item, there were five options, from 'Strongly Disagree' (=1) to 'Strongly Agree' (=5). The questionnaire also featured some questions about students' backgrounds, in addition to questions that attempted to gauge students' motivation and success, in terms of craft and technology education classes. The questionnaire was based on the PATT standards (Pupils Attitudes Towards Technology), which were designed and validated by Raat & de Vries (1986) and van de Velde (1992).

A "student-centred approach" is nature of the PATT standards; Pupils' Attitudes Towards Technology (Mottier, 1986; Todd, 1986). Raat and de Vries started PATT in 1986 with the aim of developing an instrument that could be used internationally to measure pupils' attitudes to technology. Researchers in 11 countries undertook pilot researches with the same questions. Based on these projects, an instrument was developed that was proved to be reliable and valid in the Western world (Raat, de Klerk Wolters, de Vries 1989). The instrument has now been implemented in many countries (de Klerk Wolters,1989).

Results

As seen in Table 2 the highest average value in our Likert-style questionnaire was 5 and the lowest value 1, for each of the 14 questions asked. The highest overall value (3,91) was found in a group of 13 year old boys in Iceland. The highest value of the Finish students (3,63) was also found in a group of 11 year old boys. The lowest value (3,19) was found in a test group of 13 year old girls in Finland.

The survey results mirrored Autio's 1997 research (Autio, 1997) on male test groups. However, girls' average scores were higher in the 11 year old test group than 18 years ago. The averages and standard deviation of each test group, in terms of the measurement of students' attitudes towards craft and technology, are listed in the table below

According to Autio (1997), Fensham (1992) and Lauren (1993), we could assume that there would be differences in students' attitudes towards technology. The next step, therefore, was to find out whether there were any differences between the test groups. This was done by conducting the one tailed t-test, with the same variance, on boys and girls in the Finnish test groups. In all other test groups, we employed the two tailed t-test, as we had no hypothesis based on the previous research.

It was found there was a significant statistical difference (p=0.025-0.07*) between Finland and Iceland, within all test groups (Table 3). In addition, significant statistical differences were found (p=0,005**) between Finnish boys and girls in the 13 year olds test group. Similar differences, but not as significant (p=0.08*), also were found in Iceland between boys and girls in the 13 year olds test group (Table 3).

Based on the above, students' attitudes are assumed to be rather stable during the school years (Arffman & Brunell, 1983; Bjerrum Nielsen & Rudberg, 1989). This is unlike the comparable research carried out by Autio in 1997 (1997) that found significant statistical difference (p=0,001***) between Finnish 11 year old and 13 year old girls. However, similarly, less statistical differences (p=0.07*) arose between Finnish 11 year old and 13 year old girls, during this

Test group	Average	SD
Girls 11 - year- old Finland	3,41	0,52
Girls 11 - year- old Iceland	3,69	0,60
Boys 11- year- old Finland	3,63	0,58
Boys 11- year- old Iceland	3,84	0,40
Girls 13 - year- old Finland	3,19	0,62
Girls 13 - year- old Iceland	3,60	0,55
Boys 13- year- old Finland	3,61	0,56
Boys 13- year- old Iceland	3,91	0,38

Table 2. Average and Standard Deviation for Each Test Group, With Regards to the Measurement of Students' Attitudes Towards Craft and Technology

Test groups	T-test (p-value)
Girls 11- year - olds Finland vs. Iceland	0,03*
Boys 11- year - olds Finland vs. Iceland	0,07*
Girls 13- year - olds Finland vs. Iceland	0,025*
Boys 13- year - olds Finland vs. Iceland	0,03*
Boys vs. Girls 11 - year - olds Finland	0.120
Boys vs. Girls 11 - year - olds Iceland	0,31
Boys vs. Girls 13 - year - olds Finland	0,005 **
Boys vs. Girls 13 - year - olds Iceland	0,08*
Boys 11 - year vs. 13 - year olds Finland	0,46
Boys 11 - year vs. 13 - year olds Iceland	0,58
Girls 11 - year vs. 13 - year olds Finland	0.07*
Girls 11 - year vs. 13 - year olds Iceland	0,63

Table 3. Differences Between the Test Groups, With Regards to the Measurement of Students' Attitudes towards Craft and Technology, Measured by t-test

research (Table 3). Furthermore, dissimilar, no statistical difference was found between younger and older Finnish and Icelandic boys or between Icelandic younger and older girls. The differences between the test groups are listed in the table below (Table 3).

Conclusion and Discussion

Craft education in both Finland and Iceland originated over 140 years ago and was influenced by the Scandinavian Sloyd pedagogy. In the beginning, the subjects largely focused on students copying artefacts, using a variety of handicraft tools: the purpose of this was to improve their' manual skills, rather than their thinking skills.

Since then, the subjects have moved away from craft towards technology, with the aim to increase students' technological literacy. Today, the focus is also on developing students' thinking skills, which enables them to work through various handicraft processes (from initial ideas to the final products). This work is based on the idea generation of students and is thus expected to increase their self-esteem and ingenuity.

Significant differences in students' attitudes towards craft and technology were found in the two countries. The Icelandic students' attitudes towards craft and technology were more positive in all test groups. It indicates that the Icelandic curriculum that includes two different compulsory craft subjects: the innovation and technologically based 'Design and Craft' and the art based 'Textile Education' as a suitable setup, both for boys and girls.

Although, there were significant differences between boys and girls, both in Finnish and Icelandic schools, in the 13 year old test groups, the difference was smaller in Iceland. This is an interesting finding as the Finnish curriculum has put large emphasis on gender equity since 1970. However, most of the boys still want to choose technical craft studies and the girls' textiles. A practical solution to get both sexes to choose both subjects has not been found. Therefore, it might be worth trying to take the Icelandic curriculum for craft education into consideration in Finland.

The critical side of the empirical part of the research is the use of small sample of students. 213 students is relatively small number and in some of the test groups the numbers of students were under 30. Therefore, a larger research would improve the reliability of the outcome. In addition, the questionnaire measures only students' attitude, not their absolute technological will which is shaped and guided by human emotions, motivation, values and personal qualities. The concept attitude is just a single one part of a larger concept, which is 'technological competence'. Attitude is a crucial part of the competence as it depends on technological knowledge and technological skills in real life situations.

The reasons behind the dissimilarities found between the two countries may be due to differences in the curriculums and in different pedagogical traditions. However, further research is needed before the authors can reach clarify these issues and reach their final conclusions.

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ABOUT THE AUTHORS

Dr. Gísli Thorsteinsson is Associate Professor in Design and Craftin.The School of Education at the University of Iceland. He holds a doctoral degree in Philosophy from Loughborough University in England, which focused on using a Virtual Reality Learning Environment for idea generation training in Innovation Education inIceland. Gisli was the chairman of the Icelandic Craft Teachers Society in 1995–2005, the chairman for the Nordic Slöjd Teachers Society in 2001– 2005 andon the board of NordFo, an Academic Research Society for PedagogicCraft Education in the Nordic countries, in 2000–2005. He is involved in building up a new national curriculum for ICT and Technology Education in 1999. He has published numerous articles and several textbooks on Innovations in Education and Design and Craft Education.

Brynjar Ólafsson is Adjunctin Design and Craftin. The School of Education at the University of Iceland. He holds a master's degree in education from the University of Iceland. His main research focus has been on Craft Education and its value for elementary school education. He is on the board of NordFo, an Academic Research Society for Pedagogic Craft Education in the Nordic countries. He was the chairman of a working committee for revising the Icelandic National Curriculum for Design and Craftin 2007.

Dr. Ossi Autio is a Senior Lecturer of Didactics Technical Crafts Education in the Department of Teacher Education, at the University of Helsinki. He completed his doctoral degree in Educational Sciences, at the University of Helsinki in 1997 focusing on the development of students' technical capacities in Finnish comprehensive school. His current interest and undertakings concerns: didactics of technical crafts, students´ technical abilities (technological competence) and creative problem solving in design and technology. He is an active researcher in his area and has written numerous of articles on the subject of Technology Education and Design and Craft.