Work descriptions written by third-graders: An aspect of disciplinary literacy in primary craft education

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Abstract: This study focuses on disciplinary literacy in primary craft education. *Disciplinary literacy* refers to the specialised ways of reading, writing, and speaking in a particular discipline. In Finland, crafts is an obligatory school subject, and pupils are supposed to conceive and manage a complete crafts process, including documentation. However, disciplinary literacy in crafts has rarely been studied, let alone at the primary level. In this study, we explored the quality of a sample of work descriptions produced by third-graders. The data included digitally produced work descriptions (N=79) written by 42 third-grade pupils in a Finnish primary school. Based on a qualitative analysis, six main dimensions of work descriptions as a textual genre emerged: word count, crafts vocabulary, structure, spelling, multimodality, and self-assessment. The quality of work descriptions was analysed quantitatively according to scoring criteria based on these dimensions. A cluster analysis indicated that there were three groups of work descriptions with respect to their level of disciplinarity: limited, emerging, and advanced descriptions. The results show that the structure of the disciplinary texts develops first, and subject-specific vocabulary stabilises after that. The paper discusses the foundation for disciplinary literacy in primary craft education.

Keywords: disciplinary literacy, writing, text genre, textual features, craft education

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1. Introduction

According to Cassidy et. al. (2020), disciplinary, as well as digital and multimodal, literacies are topics that are being widely discussed in various forums and are receiving a great deal of attention in the field of literacy research and practice. However, there are still disciplinary areas which are less studied in this area, especially in the context of primary school. This study aims to explore one such disciplinary area, namely, craft education at the elementary level. The Finnish Core Curriculum for Basic Education (NCC, 2016) outlines that *crafts* is a school subject in which multiple materials are used, and its activities are based on craft expression, design, and technology. Thus, it has similarities with the design and technology education of other countries (Lepistö & Lindfors, 2015). Furthermore, the core task of this school subject is to guide the pupils through management of a complete crafts process, which includes both the documentation of crafts processes and the use of information and communication technology (NCC, 2016). In this study, we focus on the documentation and investigate third-graders' work descriptions, which they wrote with digital tools during craft education.

Disciplinary literacy refers to the idea that each academic discipline, such as history, mathematics, science, literature, or crafts, has its own ways of reading, writing, communicating, understanding, and thinking – that is, conventions for communicating and representing knowledge and ideas (Grysko & Zygouris-Coe, 2019; Moje, 2008; Shanahan & Shanahan, 2014). In the Finnish National Core Curriculum for Basic Education (NCC, 2016), disciplinary literacy is outlined under multiliteracy, which, in the NCC, is one of the transversal competences linking different fields of knowledge and skills. It is thus regarded as an umbrella concept for different aspects of literacies. It is stated in the NCC (2016) that students' multiliteracy is developed in all school subjects, progressing from everyday language to mastering the language and presentational modes of different ways of knowing.

The multiliteracies approach emphasises that the use of literacy depends on context and purpose, and that literacy and meaning-making are multimodal, meaning that written-linguistic modes of meaning can be complemented by oral, visual, audio, gestural, tactile, and spatial patterns of meaning (Cope & Kalantzis, 2009). The concept of multiliteracies stems from the ideas of the New London Group (NLG), and its approach is rooted in the sociocultural tradition (Cope & Kalantzis, 2009; NLG, 1996). Though the definition of multiliteracy in the NCC (2016) slightly differs from that of NLG, the similarities include, for instance, the importance of the context in which reading and writing take place and the concept of multimodal meaning-making (see e.g. Palsa & Ruokamo, 2015). The context in disciplinary literacy is often characterised in such a way that pupils are encouraged to read, write, and think like artists, scientists, and historians (e.g., Burke & Welsch,

2018). Correspondingly, in the case of crafts, students are guided to read, write, and think like craftspersons. At the elementary level, this means that pupils take the first steps in getting to know typical text genres related to crafts and the language used in them. They also practise reading and writing these texts and using the language typical of crafts while they study different crafts techniques. Multimodality in this study refers to the combination of textual and visual elements typical in crafts documentation (e.g., Saarinen et. al. 2019).

Fang (2013, see also Grysko & Zygouris-Coe, 2019) has argued that texts are easily neglected in many science classrooms because of the common misconception that science is solely a hands-on subject. This argument also applies to crafts classes. Perhaps this is the reason that the current understanding of disciplinary literacy in crafts as a school subject is insufficient. In the following we will outline the disciplinary literacy studies at elementary level and explain the idea of a complete craft process including documentation.

1.1. Literacy studies across disciplines

Based on a systematic review of literacy studies across disciplines, Scott et. al. (2018) have presented two topics for future research. These are (1) more expansive research in writing instruction across the disciplines and (2) the integration and advancement of multiple literacies. In addition, studies on disciplinary literacy have typically focused on grades six through twelve (Shanahan & Shanahan, 2014) and less at the elementary level, perhaps because there has been a strong emphasis on improving basic reading skills at the elementary level. However, it has been argued that effective literacy instruction must include both basic and disciplinary elements across all grades (Frambaugh-Kritzer et. al., 2015; Lemley et. al., 2019; Shanahan & Shanahan, 2014). Fang and Coatoam (2013) also propose that it is possible for students to develop both generic and specialised strategies simultaneously. Shanahan & Shanahan (2014) state that general reading strategies – that is, summarisation, questioning and visualisation – can improve students' compre–hension of texts, but not to the same extent as more specific, disciplinary approaches would do. They argue that 'it is never too early' and discuss the ways elementary teachers can prepare students for disciplinary literacy. Along these lines, Lammert and Riordan (2019) modelled strategies for writing in science in elementary grades. Lemley et. al. (2019) studied elementary teachers' perspectives on disciplinary literacy, focusing on social studies, science, English language, arts, and mathematics, and Frambaugh-Kritzer et. al. (2015) explored how preservice teachers construct the meaning of disciplinary literacy in dance and drama. Furthermore, Siffrinn and Lew (2018) have modelled how elementary preservice teachers can be apprenticed into disciplinary language and literacy instruction, and Colwell's (2018) study has supported teachers in choosing disciplinary texts in English, history and social studies, mathematics, and science.

Despite the recent studies on disciplinary literacy, Grysko and Zygouris-Coe (2019) argue that educators still do not know precisely what disciplinary literacy means and how they can support students' development of it. We think that this is the case especially regarding subject areas such as craft education, which has received less attention in this field. In addition, literacy research has traditionally emphasised reading over writing (e.g. Miller et. al., 2015; Scott et. al., 2018), including in the field of disciplinary literacy (e.g. Håland, 2017). This study focuses especially on text production in craft education. It is important to study writing across disciplines, as it has been shown that writing enhances learning (Graham et. al., 2020).

There is also evidence that teaching disciplinary text production can be effective. Based on a one-group pre/post-test design, Clark et. al. (2021) found that after the disciplinary literacy instruction, second-grade students were able to produce higher-quality science informational texts in terms of providing science facts and definitions and using ending punctuation in sentences. Isidro's (2021) case study provided promising results on emerging disciplinary literacy skills in engineering among five- to eight-year-old learners through scaffolding and developmentally appropriate materials (see also Håland, 2017). Furthermore, Paugh and Wendell (2021) found that a set of disciplinary language choices supported students' reasoning as part of their engineering design process.

1.2. Documentation as part of a holistic craft process

Current craft education emphasises holistic craft processes. This means that pupils should learn to conceive and manage a complete craft process as well as its documentation as outlined in the NCC (2016). Pöllänen (2009) refers to the holistic craft process by stating that it consists of the following three phases: (1) developing ideas and designing, (2) making, and (3) evaluating. Thus, the goal of craft education is that the pupils slowly gain the mastery of an entire craft production process. In the NCC (2016), this is expressed as follows: "students should create ideas, construct design solutions by using various techniques and materials, document the different stages of the process, and conduct peer- and self-assessment" (NCC, 2016, pp. 528–533). This means that documentation as a subject-specific text production practice that represents disciplinary literacy in crafts is an integral part of craft education (see Pöllänen, 2009). Though some aspects of the holistic craft process have been studied (e.g. Hilmola & Lindfors, 2017; Porko-Hudd et. al., 2018), less attention has been paid to its documentation phase. However, Saarinen et. al. (2016; 2018) have studied pupils' experiences using ePortfolios as a process portfolio in primary level craft education, and Saarinen et. al. (2019) clarified the types of learning activity and cognitive processes that were made visible through the ePortfolios.

Besides emphasising disciplinary text production, the NCC (2016) encourages pupils to use digital technology in documenting their work processes. We collected the data (pupils' work descriptions) via electronic portfolios (ePortfolios), which is one option for conducting digital documentation in crafts (see Törmälä, 2021).

1.3. Work description as a text genre

In this study, we focus on the disciplinary text genre *work description*. It evolved in school practice as the National Core Curriculum (NCC, 2016) began to emphasise documentation practices as part of a complete crafts process. A *work description* is a text in which a craftsperson documents the process of making an artefact. To our knowledge, this text genre has not been studied in the elementary context, since studies in the field of disciplinary literacies have mainly concerned texts in science at the elementary level, and typical text genres in writing studies at the primary level, at least in the Finnish educational context, have included mainly stories, and sometimes essays (Kauppinen et. al., 2015; Kulju et. al., 2017). We do have information on the content of ePortfolios, as Saarinen et. al. (2019) found that ePortfolios produced by sixth-graders included four main categories: the artefact, the process, and the free and formal reflections. The studies on the use of ePortfolios have outlined important possibilities of ePortfolios as documentation tools in crafts. However, in this study, we focus more on the features of the specific text genre with younger pupils.

As a text genre, craftsperson's work description has its own features, such as discipline-specific vocabulary and phrase structure. In craft education, the subject-specific vocabulary is typically related to materials – for example, *wool, fabric, wood, copper* – and techniques such as *sew, operate a sewing machine, a stitch, crochet, drill, saw.* The sentences in this type of text are often in chronological work order and rather short, and the use of past tense and passive voice is typical. In addition, visual elements, such as figures, photos, and videos, are typical; thus, the texts are often multimodal, combining written text and visuals (cf. Cope & Kalantzis, 2009). However, since the text type is not studied earlier in the context of school instruction, we do not have any previous information about what specific features of this text genre are relevant for third-graders and how effectively young pupils are able to write in it.

Even though disciplinary literacy studies focusing on text production in elementary grades seem to concern mainly science and engineering instruction, they provide valuable information relevant to disciplinary text production in other disciplines as well. For instance, Clark et. al. (2021) took into account categories related to text structure and vocabulary in studying the quality of second-graders' informational science texts. They looked at word count and signal words to indicate text structure, as well as the number of science facts and definitions in the texts. In addition, they examined the use of an introductory sentence, a concluding

sentence, capitalisation, and ending punctuation. Furthermore, in this special issue Meneses et al. (2023) present a rubric for written scientific explanations which includes communicative-discursive, textual, grammatical and lexical dimensions of language.Wright (2014) points out the importance of words and concepts and emphasises that they should be taught explicitly from early on and that there should be authentic opportunities to review and practice content-rich words.

1.4. Current study

This study seeks to examine disciplinary text production in elementary craft education. We focus on work descriptions that have been created during a holistic craft process by using digital tools. Adopting a disciplinary literacy approach requires teachers to shift their instructional practices away from general reading and writing strategies towards a more nuanced examination of the discipline and the use of literacy within the discipline (Grysko & Zygouris-Coe, 2019; Pytash & Ciecierski, 2015). Thus, in order to instruct third-graders to document their work in crafts, teachers should be aware of the features of the disciplinary genres of the area and typical language used in it. Similarly, as the language of science differs substantially from the language that students use in daily social interactions (Fang, 2005; Grysko and Zygouris-Coe, 2019), the language of crafts includes specific terms and ways of presenting ideas.

So far, teachers have used their own pedagogical reasoning to teach the documentation of craft processes, because there is little research on disciplinary literacy practices in craft education. The effort put into teaching documentation is likely to vary widely among the teachers due to a lack of research-based pedagogical material. Thus, there is an urgent need to explore the disciplinary practices of craft education and broaden the understanding of textual genres related to crafts. Accordingly, this study is guided by a research question as follows: What is the quality of work descriptions produced by third-graders in craft education?

2. Methods

2.1. Educational context and participants

Craft education is an obligatory and a common school subject for boys and girls in basic education in Finland. It has a 150-year history in the Finnish school system (Saarinen et. al., 2016). Nowadays, there are two hours of crafts teaching per week in the third-grade curriculum. In elementary grades, the school subject of crafts is often taught by class teachers, not by specialised subject teachers, which is also the case in this study.

The participants in the study were 42 third-grade pupils, aged 9 to 10 years, from two separate classes in the suburban comprehensive Owl School, in the 2016–2017

school year. Owl School is located in southern Finland, in a city municipality with approximately 24 000 inhabitants. Class A consisted of 10 boys and 12 girls, and Class B consisted of 12 boys and eight girls. The teachers of Class A and Class B were regular class teachers with several years of teaching experience at elementary level. In the 2016–2017 school year, Owl School was attended by approximately 800 typically monolingual Finnish speaking pupils ranging from pre-school to ninth grade. Basic education in Finland is non-selective, and every pupil is allocated a place in a nearby school. Finland has low levels of stratification in its education system, which means that no class enjoys more advantages than any other (OECD, 2012). Written consent for data collection and conducting the research was sought from the pupils, from their parents, from the city municipality, and from the school principals. Pseudonyms are used for the school (Owl School), for the classes (Class A and Class B), and for the pupils (invented names) in order to protect the anonymity of the participants.

2.2. Data collection

The data consisted of 79 work descriptions, created by the pupils (N=42) during the school year. The data were collected as part of a pedagogical project conducted in two classrooms that aimed at experimenting with and developing digital documentation practices, based on disciplinary literacies, in the school subject of crafts. This was the first project of its kind for both teachers and pupils. The first author participated in the pedagogical project in the role of teacher and researcher. The pupils created work descriptions using desktop and tablet computers (Apple iPads), familiarised themselves with the digital learning environment called Peda.net, and learnt to use ePortfolios as a process- and development-reporting tool in craft education, combining visual photos and written texts (for more information on Peda.net and ePortfolios, see Törmälä, 2021).

The pupil participants produced three crafts artefacts each, and created the work descriptions based on these crafts artefacts: a wooden dice (18 work descriptions), a potholder made of cloth (34 work descriptions), a tuned coat hanger (24 work descriptions), and a wooden balance board (3 work descriptions). The two classes experienced different numbers of lessons for producing the work descriptions, as the documentation process was first started by one class only (Class A), and the other class (Class B) started a couple of months later (Törmälä, 2021). Thus, the pupils of Class A created more work descriptions than the pupils of Class B, but the pupils also created different numbers of work descriptions because the working and writing speed of the pupils varied. Two to four 45 minute lessons were required for producing the work description of one crafts artefact. Pupils of Class A created 48 work descriptions, and Class B, 31. In Class A, seven pupils managed to create three entries each, 12 pupils created two entries each, and three pupils created only one entry each. In Class B, 12 pupils created two entries each, and

seven pupils one entry each. In this study, we focus solely on the end results – that is, the work descriptions.

2.3. Pedagogical process

The pupils' task was to document the process of making a crafts artefact, in other words, to write a short work description in their personal ePortfolio. In addition, the task included taking a photo of the artefact, saving the photo through an online service, and writing a self-assessment to reflect on their learning as encouraged by the NCC (2016).

The project was carried out as a whole class teaching. Instruction prior to the writing task included the following aspects. First, some examples of work descriptions, written by the teachers, were read through together with the pupils in order to give the pupils an idea of what was expected from them. The purpose was to give the pupils an idea of the work description as a text genre, and to teach them disciplinary writing with model texts (see e.g. Alston et. al. 2021). Crafts vocabulary and chronological order of key working stages were highlighted.

Second, the pupils were given explicit instruction of disciplinary literacy practices in the form of writing frames (Grysko & Zygouris-Coe, 2019; Warwick et. al., 2003; Wellington & Osborne, 2001) to help them organise and structure their work descriptions. Wellington & Osborne (2001) and Warwick et. al. (2003) refer to writing frames to scaffold young pupils' writing skills in science instruction. Wellington and Osborne (2001) describe writing frames as templates that contain, for example, sentence starters, key language information, and sentence modifiers that together provide a template or a skeleton that helps students organise and structure their writing. Thus, the writing frames help the students construct written text that adheres to the particular text genre of a certain discipline (Grysko & Zygouris-Coe, 2019). The writing frames introduced to the pupils by the teachers included the following sentence starters:

The first working phase was…
The second working phase was…
The third working phase was…
Firstly, … / Secondly, … / Thirdly, … / Ultimately, …
We started… / After that… / Then… / Lastly…

Third, crafts-related terminology was actively used during crafts lessons, and the key terms were discussed in connection with the writing frame introduction. The key terms, both verbs and nouns, that were used with the pupils can be seen in the Appendix.

Fourth, the pupils were taught to write a self-assessment as one of the objectives of crafts is to guide the pupil to "assess, appreciate, and examine his or her own crafts process [...] as a whole" (NCC, 2016, p. 530). For self-assessment, the teachers provided three questions that were to be answered:

What was easy?
What was difficult?
What did I learn?

During the documentation lessons the pupils were allowed to ask for help from their peers and the teachers. However, the pupils mainly concentrated on their own texts and the peer-to-peer feedback as well as the individual feedback during the process given by the teachers were scarce.

2.4. Qualitative analysis and scoring criteria

The analysis proceeded in two phases. First, we authors aimed to define textual features of work descriptions in order to create a scoring rubric that could be used in evaluating the quality of third-graders' work descriptions. We began by reading through the data to form the key dimensions that characterise them. Several iteration rounds were needed to ensure that the dimensions were valid and defined properly.

We found six key dimensions that characterised work descriptions as a text genre. These dimensions concerned overall text structure and length, vocabulary, spelling and orthographic rules, multimodality, and self-assessment (Table 1).

After defining the key dimensions, we created a scoring system to evaluate pupils' work descriptions. We examined the texts concerning each dimension to identify representative scoring criteria with three levels (from 0 to 2). The dimensions are presented below and summarised with scoring criteria in Table 1.

- ***Word count total.*** We counted the words of each work description. As we read through them, we noticed that texts varied from fewer than 10 words to over 100 words. We noticed that the shortest work descriptions consisted of only a couple of sentences or less. We allocated scores for total words: 0-12 words scored 0; 13-30 scored 1 and more than 31 words scored 2.
- ***Crafts vocabulary.*** Key verbs and key nouns of different crafts artefacts were defined by the teachers before the teaching took place, and these keywords were actively used during the crafts lessons. Scoring was based on the number of keywords used in the work description (Table 1). The keywords used with the pupils are presented in the Appendix. We did not require the most abstract subject-specific words even though some of them were used in teaching, for example 'an opening for turning'.

- ***Text structure.*** The *text structure* here refers to the key work stages presented in chronological order. The pupils were expected to document the stages and indicate them linguistically with sentence starters in order to get a score of 2 in the dimension *structure*. For example, the key work stages of the crafts artefact *pot holder* were: (1) oversewing of the two denim fabric edges, (2) decorating of one of the denim pieces by sewing (different colours and stitches), (3) sewing of terrycloth onto one of the denim pieces, (4) sewing the two denim pieces together with the right sides facing each other (the hanging loop sewed at the same time, and an opening for turning left), and (5) turning of the pot holder over (closing of the opening by sewing, and cutting of the sewing threads). Using just numbers to indicate the order of the stages was not specific enough for two points in the work descriptions. Sentence starters, like first or finally needed to indicate order. The teachers defined the key work stages of the different crafts artefacts during the teaching.
- ***Spelling.*** The *Spelling* here refers to the correct spelling at the word level as well as other conventions at the sentence level. The orthographic sentence-related spelling rules relevant to third-graders are specified in the NCC (2016) as follows: (1) the capital letter at the beginning of the sentence, (2) words separated by spaces, and (3) the use of punctuation at the end of the sentence. Note that the pupils in our study had not practised typing as much as handwriting. Handwriting had been the main method in these classes so far, giving students limited experience in producing text on computers or tablets in educational contexts.
- ***Multimodality****.* Multimodality was a simple dimension. Both the written text and the photo in the pupils' production resulted in a score of 2. Texts including only written text were scored as 1, and photo only as 0.
- ***Self-assessment.*** The self-assessment was scored based on the three questions that the pupils were requested to answer:

  What was easy?
  What was difficult?
  What did I learn?

  Writing no self-assessment resulted in 0 points. If the self-assessment existed, but was merely about what was nice or dull, the score was 1. If the self-assessment discussed the easy or difficult part(s) of the process and/or there was reflection about what the pupil had learnt about the process, the score was 2.

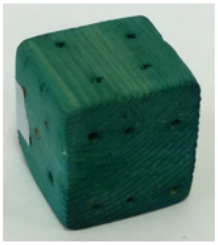
After defining the scoring criteria, we evaluated the 79 work descriptions accordingly. One researcher initially evaluated all the work descriptions to provide

consistency across the work description evaluations. Later, another researcher evaluated a subset (15%) of the work descriptions, and 86% agreement was reached.

Table 1. A Scoring Rubric of Six Text Dimensions and Their Scoring Criteria

Evaluation criteria	**Score**		
(Dimensions)	**0**	**1**	**2**
Word count total	0–12 words	13–30 words	31 or more words
Crafts vocabulary	0–3 words	4–7 words	8 or more words
Structure	0–2 key stages of work documented. No sentence starters.	3–4 key stages of work documented and sentence starters used at least partially.	All key stages of work documented in chronological order and sentence starters used systematically.
Spelling	Systematic errors at both the word and sentence level. Spelling errors in words and several missing capitals and punctuation.	Errors especially at sentence level: some missing capital letters and/or missing punctuation.	Correct spelling and orthographic rules followed at word and sentence level.
Multimodality	Photo only (no text available)	Text only (no photo available)	Photo and text available
Self-assessment	No self-assessment	Pupil has written what (s)he liked and what not. No text about what (s)he learned.	Pupil has written what was easy/difficult and/or what (s)he learned.

Arpakuutio



Ensimmäinen vaihe oli että mitattiin. toinen vaihe sahattiin.3 vaihe hiottiin.4 vaihe porattiin reiät arpakuutioon.5 vaihe petsattiin arpakuutio.

kivoin työvaihe sahaaminen ja numerojen poraaminen. Tylsin työvaihe oli mittaaminen.Ja helpoin työvaihe oli viilaminen ja petsaaminen.Tämä työ oli haastava.

Figure 1. Example of a third-grade pupil's work description, including a photo in her ePortfolio.

> *Dice*
>
> *The first phase was that we measured. the second phase we sawed. 3 phase we sanded. 4 phase we drilled holes in the dice. 5 phase we stained the dice.*
>
> *the nicest working phase sawing and drilling the numbers. The dullest working phase was measuring. And the easiest working phase was filing and staining. This work was challenging.*
>
> (Vivian, work description of the wooden dice)

One example of a work description is presented in Figure 1. The original work description of the wooden dice has been translated from Finnish to English below the figure, and the original errors, if possible, have been left in the English translation.

Vivian's original work description in Finnish consisted of 41 words in total, and she used six crafts-related terms that apply to producing the wooden dice: *measure*

(verb), *saw* (verb), *sand* (verb), *drill* (verb), *stain* (verb), and *filing* (noun). When the pupil used a verb and a noun deriving from the same root, only one of the words was counted, for example, *a saw/sawing* and *to saw.* The structure of this example contained all the key working stages in chronological order, and the sentence starters were used even though the pupil had switched to the combination 'number and phase' in the middle of her description. Nonetheless, her writing resulted in a score of 2 based on the scoring criteria. The spelling and orthography of the text, in turn, resulted in a score of 1 because of the grammatically incorrect way of using numbers and the missing capital letters at the beginning of the sentences. Additionally, in the sixth sentence, in the self-assessment part of the text, the verb 'was' is missing. As such, the self-assessment fulfils the score 2 criteria, because the pupil has specified what was easy and that the overall project was challenging. The work description contains a photo taken and saved by the pupil. Thus, the multimodality scoring criteria are fulfilled. Vivian received the following scores for her work description: word count total 2, crafts vocabulary 1, structure 2, spelling 1, multimodality 2, and self-assessment 2.

2.5. Statistical analysis

The second phase was statistical analysis. It aimed at assigning the objects under study – that is, the 79 work descriptions – to distinct groups with a high degree of similarity within the group. The data were clustered using two-step cluster analysis (SPSS 26). We chose the two-step method for clustering our sample into different groups because it does not assume normality of distribution and is suitable for small data sets (see, for example, Gelbard et. al., 2007). In the cluster analysis, we used the categorical variables based on dimensions presented in Table 1: word count total, crafts vocabulary, structure, spelling, multimodality, and self-assessment.

In order to determine the optimum solution for the number of clusters, cluster analysis was carried out several times. We examined the two-, three-, four-, and five-cluster solutions. The three cluster solution showed meaningful differences, had acceptable cluster quality in cohesion and separation, and appropriately represented our data. To examine the differences between Groups 1, 2, and 3 on six dimensions, a one-way non-parametric ANOVA (Kruskal-Wallis Test) and a post hoc test (Bonferroni) were used.

3. Results

The quality of the third-graders' work descriptions was evaluated by assessing six different text dimensions of each description and scoring the dimensions based on scoring criteria. The frequencies of different scores (0-2) in six text dimensions of work descriptions are presented in Table 2. Pupils struggled, especially in self-

assessment, spelling, and crafts vocabulary, whereas the criterion, multimodality, as a text dimension was fulfilled in almost every work description.

Table 2. Frequency Distribution of Scores (0-2) in Six Text Dimensions of Work Descriptions (N=79) by Third-Grade Pupils

	Word count total % (N)	Crafts vocab. % (N)	Structure % (N)	Spelling % (N)	Multi-modality % (N)	Self-assessm. % (N)
Score 0	6.3 (5)	6.3 (5)	6.3 (5)	10.1 (8)	0.0 (0)	44.3 (35)
Score 1	38.0 (30)	68.4 (54)	30.4 (24)	70.9 (56)	2.5 (2)	22.8 (18)
Score 2	55.7 (44)	25.3 (20)	63.3 (50)	19.0 (15)	97.5 (77)	32.9 (26)
Total	100.0 (79)	100.0 (79)	100.0 (79)	100.0 (79)	100.0 (79)	100.0 (79)

Regarding the dimension *multimodality*, the scores were high because most of the texts included a photo due to the fact that pupils received a great deal of support from the teachers and school assistants in the photographing phase of the documentation project (Törmälä, 2021). Regarding *spelling*, as can be seen in Table 2, only 15 of 79 texts were scored as 2. There were eight texts that received 0 points and 56 texts that received 1 point. The pupils were reminded about the orthographic sentence-related rules relevant to third-graders (specified in the NCC (2016): (1) the capital letter in the beginning of the sentence, (2) words separated by spaces, and (3) the use of punctuation at the end of the sentence) during the documentation project. It is to be noted that the teachers neither read the texts through systematically, nor corrected the texts during the documentation project. Feedback to the pupils was given interactively as they were writing their texts and asked for help.

Cluster analysis was used to divide the work descriptions into distinct groups. As a result, three distinct groups emerged. There was a statistically significant difference between the groups in four dimensions, as determined by one-way non-parametric ANOVA (Kruskal-Wallis test) (Table 3). These dimensions were word count total, crafts vocabulary, structure, and self-assessment. The groups did not differ significantly in two dimensions: spelling and multimodality. A post hoc test (Bonferroni) was run to confirm where the differences occurred between the groups.

Table 3. Modes (*Mo*) and Frequencies (*f*) of the Work Description Dimensions in Each Cluster (Group 1, Group 2, Group 3), as well as ANOVA Results Comparing the Scores of the Dimensions in the Clusters

	Group 1		Group 2 (N=32)		Group 3 (N=20)			
	Mo	*f*	*Mo*	*f*	*Mo*	*f*	*p*	*η2*
Word count	1	16	2	20	2	18	<.001	.32
Crafts	1	23	1	31	2	20	<.001	.80
Structure	1	20	2	28	2	20	<.001	.65
Spelling	1	17	1	25	1	14	.059	.07
Multimodalit	2	25	2	32	2	20	.142	.05
Self-	0	21	2	16	2	10	<.001	.30

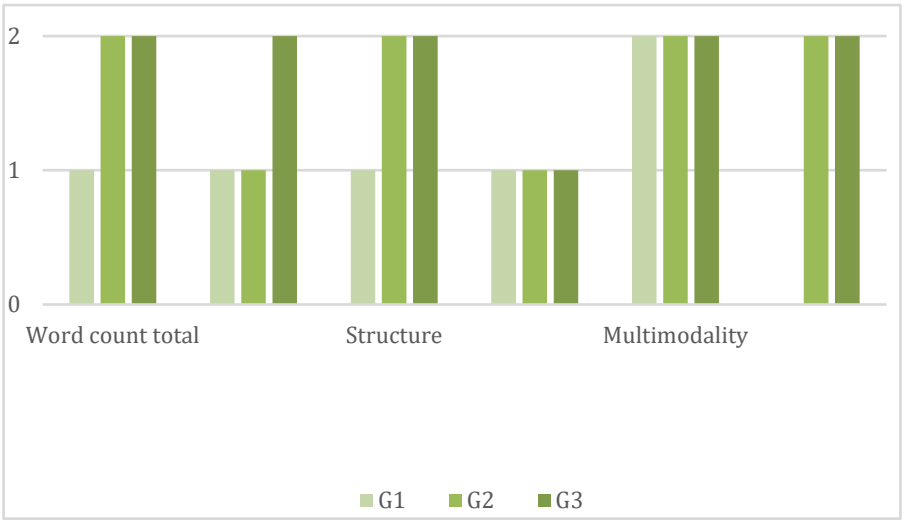


Figure 2. Modes of the work description dimensions in each cluster (Group 1 (G1), Group 2 (G2), Group 3 (G3).

Figure 2 illustrates how and in which dimensions the three groups differed from each other. The modes in Group 1 and Group 2 differed in three dimensions: *word count total, structure,* and *self-assessment*. However, the modes in Group 1 and Group 2 were similar with respect to the dimension *crafts vocabulary*. Furthermore, Groups 2 and 3 differed with respect to one dimension, which was *crafts vocabulary*. However, the modes in Groups 2 and 3 did not differ in the dimensions *word count total*, *structure*, and *self-assessment*.

We defined the groups as (1) *limited work descriptions*, (2) *emerging work descriptions*, and (3) *advanced work descriptions*. In the following, we will describe and summarise the characteristics of the descriptions more specifically as clustered in the three groups, focusing on the four dimensions in which the groups differed statistically (Table 3). We use work descriptions of the pot holder as example texts within each group to give the reader an idea about the quality of the work descriptions on different disciplinary levels.

Limited work descriptions. We defined Group 1, comprising 27 work descriptions in total, as *limited work descriptions*. The modes for the work descriptions of this group on the dimensions *word count total, crafts vocabulary*, *structure*, and *spelling were all 1, and the dimension self-assessment* was 0 (see Table 3). The work descriptions of Group 1 can be described as texts that were low in word count and in appropriate crafts vocabulary. In addition, they often lacked the self-assessment. Specific crafts-related words were typically missing, or inappropriate words were used, as seen in Example 1 below: The verb 'sew' has been replaced by 'decorate' and 'attach', and the noun 'hook' should be 'hanging loop'. The structure in the Group 1 work descriptions was often rudimentary: Example 1 below lacked many of the work stages, whereas Example 2 included most of the stages of the crafts process in chronological order. The following translated work description examples represent limited work descriptions (the photo and the original Finnish text have been omitted). In addition to the above-mentioned features, Example 2 also had problems in spelling and orthographic rules – for example, lack of capital letters – and lacked the self-assessment part of the work description.

Example 1
We had to decorate and attach a terrycloth and decorate and attach a hook. Edges were zig-zag I did not learn anything!
(Mika, work description of the pot holder)

Example 2
denim edges were finished with zig-zag. 2.decorated 3.detached terrycloth 4. sewed up 5.
(Markus, work description of the pot holder)

Emerging work descriptions. The Group 2 texts were categorised as *emerging work descriptions* in this study. There were 32 such descriptions in total. Similar to the Group 1 texts, the texts of Group 2 were also typically poor in crafts vocabulary. Group 2's total number of words was relatively abundant (mode 2) and the texts typically followed the structure guidelines provided by the teachers. Regarding the *structure* (mode 2) and *self-assessment* (mode 2), the Group 2 work descriptions were more advanced than those of Group 1. However, the usage of crafts vocabulary was poor also in the Group 2 work descriptions (mode 1). In the following work description (Example 3), the exact crafts term 'sew' was replaced by generic terms 'attach' and 'detach'. However, usage of the sentence starters is systematic.

Example 3
First we finished the pot holder edges with zig-zag. Second we decorated another pot holder. third we detached terrycloth with another denim piece.Fourth we attached denim pieces with each other together. Fifth we turned over the work.
decorating was easiest.
attaching loop was most difficult.
(Helmi, work description of the pot holder)

Advanced work descriptions. We defined the Group 3 texts, which were 20 in total, as *advanced work descriptions*. Most of the descriptions at this level had 31 or more words in total: the highest number of words was 116. Additionally, the disciplinary advanced work descriptions were abundant in crafts vocabulary (8 or more terms), and all the texts typically fulfilled the structure-related requirements (mode 2). However, only in 50% of the work descriptions the dimension *self-assessment* was scored as 2. This result is similar to Group 2's *self-assessment* dimension (see Table 3). The following text (Example 4) represents an advanced work description. It had one of the most profound self-assessments within the data sample, and sentence starters were used systematically.

Example 4
Firstly we oversewed edges of the denim pieces with zig-zag. Secondly we decorated one of the pieces, and we were allowed to choose the patterns. Thirdly we attached the terrycloth with that side we had not decorated. Fourthly we sewed the denim pieces together, and at the same time attached the hanging loop. Fifthly we turned the pot holder over and cut all the extra sewing threads.

> *Making a pot holder was a nice thing because there were so many phases and I learned to do many things. Most difficult was attaching the loop. easiest was decorating and it went easy and quick. i was allowed to choose the colours for the patterns. The colouring was, let's say, satisfying.*
> (Alma, work description of the pot holder)

To conclude, based on the results described above, three distinct groups emerged from the cluster analysis reflecting different disciplinary levels of work descriptions. When comparing limited work descriptions with emerging disciplinary work descriptions, in emerging disciplinary texts the word count increases, and the structure strengthens. However, crafts vocabulary usage does not strengthen until the descriptions of the advanced work group. Thus, the text structure, here meaning chronological order and sentence starters, seems to be easier to apply than the usage of subject-specific crafts vocabulary. In other words, the text structure is used appropriately before the crafts vocabulary stabilises.

4. Discussion

In this study, we aimed at exploring the quality of work description produced by third-graders in craft education. Based on a qualitative analysis, we defined six key dimensions to illustrate the text genre: word count, crafts vocabulary, structure, spelling, multimodality, and self-assessment. Some of the dimensions are more general, such as word count, spelling, and multimodality, while others are more characteristic of this specific genre, such as crafts vocabulary and structure.

We then formed a scoring rubric based on these dimensions in order to study the quality of the third-graders' work descriptions. Cluster analysis was used to divide the work descriptions into three groups with respect to level of disciplinarity: limited, emerging, and advanced. The findings revealed that the three groups showed differences in word count total, crafts vocabulary, structure, and self-assessment. The groups did not differ significantly in two dimensions: spelling and multimodality. The advanced group of texts differed from the emerging and limited ones particularly in crafts vocabulary. The emerging group of texts differed from the limited group of texts in word count total and in structure. Thus, it seems that the structure of the disciplinary texts develops first, and only after that does the subject-specific vocabulary stabilise.

The correct use of subject-specific crafts vocabulary was characteristic of the advanced group of work descriptions. We noticed that, especially in the group of emerging texts, there were words that referred to crafts-specific materials and techniques, but these words were not exact terms used in the field of crafts, but rather generic words, such as 'to make a hole' instead of 'to drill', 'to attach' instead of 'to sew', and 'to paint' instead of 'to stain'. Nonetheless, some of the inaccurate, or even incorrect, words showed notable creativity by the pupils, for example

'lambswool' and 'piece of towel' instead of 'terrycloth'. In order to achieve an advanced level in the work descriptions, knowing and using the exact crafts vocabulary is important, as indicated by this study. Thus, attention should be paid to systematic ways to help develop pupils' crafts vocabulary. Grysko and Zygouris-Coe (2019) refer to strategies for vocabulary learning in science instruction which include, for example, sorting of the words into meaningful categories and visualising connections between the key vocabulary and certain features. Similarly, the crafts vocabulary used with the pupils should be carefully examined and systematic vocabulary-building activities, such as the building of concept maps or categorised word lists, should be organised. The word lists could include, for instance, materials (nouns), tools (nouns) and techniques (verbs).

Previous studies have shown that word count (length of texts) is an indication of quality in children's writing (Morphy & Graham, 2012; Ukkola et. al., 2020). Morphy and Graham (2012) argue that length may serve as a proxy for overall writing development, since a reasonably well-written longer composition requires the use and coordination of a variety of skills. This study also indicates that most advanced texts were longer but also better in quality in terms of text structure and subject-specific vocabulary.

However, in this study, spelling did not impact the quality of the work descriptions as shown by the cluster analysis. By spelling, we mean not only word-level spelling but also very basic sentence-level orthographic rules such as capitalisation of letters at the beginning of sentences. In the case of older pupils, mastery of more complicated sentence-related rules, like usage of main and subordinate clauses instead of plain main clauses, could be worth examining. In this study concerning third-graders, even the advanced group of work descriptions included texts with some spelling problems. Part of the spelling difficulties may be due to the fact that the classes had mainly used handwriting by the time they wrote these work descriptions, which were written on a keyboard. Text production, in a pedagogically appropriate manner, should happen as a process including feedback and time for editing and rewriting of the text. In our learning project, the technical issues of using ePortfolios were very time-consuming, and finalising of the texts remained incomplete (see Törmälä, 2021). Despite some problems in spelling and orthographic rules in the data, it is indeed possible to develop both generic and specialised strategies simultaneously (Fang & Coatoam 2013), as the advanced text group shows. Thus, effective disciplinary literacy instruction can begin in the elementary stages, even with pupils aged 9 to 10 years, as in this study. As Fang and Coatoam (2013) state, there is no doubt that even struggling (adolescent) readers still need more generic instruction for their writing, however, they are capable of learning discipline-specific text production at the same time. Also, Frambaugh-Kritzer et. al. (2015) point out that it is never too early to apprentice elementary students to the disciplines.

The text structure, here chronological order and sentence starters, was skilfully applied in most of the emerging and advanced work descriptions. Even though the structure of the limited texts was typically rudimentary, the chronological order of the work stages was a feature that was well understood and applied in the texts. There were, for example, limited work descriptions that lacked work stages, but the stages that were documented were in chronological order. This may be because children are already familiar with the chronological structure of narrative texts. Introduction of the writing frames and the ready-made sentence starters were sufficiently concrete as tools in scaffolding the pupils when formulating their texts, even though use of sentence starters presumably was not as easy or familiar an operation as chronological order.

In this study, multimodality did not differentiate the groups, and this dimension was successfully produced even in the limited group of texts. This is apparently because the documentation started with taking a photo of the crafts artefact and saving it in the digital learning environment, a process for which the pupils received a great deal of teacher support. Though this criterion in this study proved to be easy, it is worth noting that the photo as an element can be regarded as an important part of the work description. Even if the pupil was not capable of writing much text, he or she was able to take a photo and save it. The function of the photo was to support the text and vice versa. Including the photo made it possible for every pupil to be able to admire the process and the end result he or she had managed to achieve (cf. NCC, 2016). Furthermore, Shanahan and Shanahan (2014) stress the importance of including different modalities such as pictures and graphs in texts handled in lessons of disciplinary literacy. However, the criteria of multimodality could be refined in the future studies, for example by taking into account the visual documentation of both the final product and the process.

In the documentation process, the self-assessment was the last task to be accomplished by the pupils, and though it did differentiate the groups, even the advanced group had some problems with it. It seems that the self-assessment is demanding and would require more practice and support from the teachers, as also pointed out by Saarinen et. al. (2019).

The data in this study included work descriptions that the pupils wrote for the first time. To develop in writing this genre, similar writing assignments should be assigned regularly (cf. Miller et. al. 2018) and more time should be spent on it. This is problematic because due to limited working hours for crafts, the teachers may want to focus more on teaching the crafts techniques rather than improving the writing skills and quality of documentative texts. However, the work descriptions are not written simply for the sake of writing; at its best, the writing process creates space for discussing contextual issues such as the meanings of specific disciplinary words. According to Graham et. al. (2020), writing is a tool pupils can use to construct meaning in content classes. Thus, we suggest that writing in crafts may

support pupils in perceiving and identifying the holistic craft process (Pöllänen, 2009) as well as the working stages of an artefact.

In this study we have concentrated on the quality of one discipline specific text genre. To sum up, some guidelines can be drawn from this study on how teachers can support young pupils in writing work descriptions. The writing instruction should start by modelling the desired text genre and structure. This can be done by giving concrete writing frames and sentence starters. Discipline specific vocabulary should be highlighted during the crafts process and again reviewed during the writing, for example, with the help of concept maps. In addition, self-assessment should be supported with concrete questions and joint discussion. In general, verbal activities and discussions seem to support and advance disciplinary writing, as also Enright et al. (2023) note in this special issue. Finally, the process should include time to edit the text including spelling and basic orthographical issues. The presented scoring rubric (Table 1) may provide insight to teachers to the relevant textual features concerning this text genre. It may also serve as an assessment tool.

In a more general sense, teaching documentation as part of a complete craft process or any other disciplinary writing instruction requires teachers to have multifaceted knowledge. First, they should be aware of the subject specific contents such as various techniques and materials in the case of crafts. Second, they should have an understanding of the literacy aspects of the discipline such as subject specific vocabulary and text structures as texts can be considered to reflect the thinking processes used by the professionals in the discipline (Carney & Indrisano, 2013). Third, teachers should have more general knowledge about writing as an act of composing and the pedagogy of teaching writing (Carter et. al. 2022; Morgan & Pytash, 2014). This challenge has led to thinking about teacher collaboration as a solution to develop good practices to teach disciplinary literacies (Fang & Coatoam, 2013). In this issue, also Enright et al. (2023) point out the need to embed writing instruction across the disciplines. In the case of elementary grades concerning science Grysko and Zygouris-Coe (2019) suggest collaboration among elementary school teachers, science curriculum specialists, and literacy coaches for co-constructing knowledge about literacy in science. Similar discussion should also concern crafts education, such as about the key disciplinary texts in reading and writing in crafts, how they can be effectively included in teaching, and the exact qualitative requirements for documentation. However, as pointed out by Carney and Indrisano (2013), if teachers had this type of capacity themselves, they could provide effective pedagogy, not only for the content, but also for the ways of reading, thinking, and knowing that are germane to a discipline. To develop this knowledge teacher education should offer pre-service teachers different strategies for focusing on the language demands of disciplinary activities (Siffrinn & Lew, 2018).

This study has some important limitations. First, the data are only from one school and one grade level in Finland. More research is needed on older pupils and other countries. Second, it focused on the results of text production of one text genre. The viewpoints of reading and speaking were beyond the scope of this study, even though disciplinary literacy as a whole covers reading, writing, and speaking (e.g., Shanahan & Shanahan, 2014). However, despite these limitations, this study outlines the key features of the work descriptions that need attention.

The growing awareness of the concept of disciplinary literacies, as well as multiliteracies, has led to consideration of literal practices of all school subjects, also those in which reading and writing are not the central focus. Following Shanahan and Shanahan (2014), we think that by paying attention to literacy practices across disciplines, teachers support pupils' understanding of the often nuanced differences among a wide range of text types. This prepares pupils not only for studying more advanced disciplinary literacies on higher grades but it is also likely to develop their cross-curriculum writing. For instance, practising work description in craft education gives them an idea of what it is to write to describe. Similar effects may arise if disciplinary writing includes for instance reporting or providing instructions (cf. National Curriculum for England, 2013; NCC, 2016).

This paper serves as an opening to understanding the disciplinary literacy practices in elementary craft education and provides tools for teachers to structure their instruction and evaluation of pupils' work descriptions in elementary grades. To develop disciplinary literacy more fully in craft education, future research should focus more broadly on authentic disciplinary practices not only in writing but also in reading and speaking in design- and crafts-related school subjects.

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Appendix A: The Subject-Specific Verbs and Nouns Defined by Teachers and Used with Pupils During Crafts Lessons and Craft Documentation

Term in English	Term in Finnish	V = verb N = noun
denim	farkkukangas	N
drill	porata	V
a drill	pora	N
edges of fabric	kankaan reunat	N
fabric	kangas	N
felt	huovuttaa	V
file	viilata	V
a file	viila	N
a hammer	vasara	N
a hanging loop	ripustuslenkki	N

measure	mitata	V
a needle	neula	N
nail	naulata	V
a nail	naula	N
an opening for turning	kääntöaukko	N
oversew	huolitella	V
paint	maalata	V
paint	maali	N
a pin	nuppineula	N
sand	hioa	V
a sandpaper	hiekkapaperi	N
saw	sahata	V
a saw	saha	N
a screwdriver	ruuvimeisseli	N
screw up	ruuvata kiinni	V
sew	ommella	V
a sewing machine	ompelukone	N
a sewing thread	ompelulanka	N
stain	petsata	V
a stitch	ommel, tikki	N
terrycloth	frotee	N
turn over	kääntää ympäri	V
zigzag	siksak	N