A QUANTITATIVE STUDY OF THE LEARNING MATERIALS USED IN DANISH L1

JEPPE BUNDSGAARD*, BETTINA BUCH** & SIMON SKOV FOUGT*

** Danish School of Education, Aarhus University ** University College Absalon*

Abstract

Textbooks or learning materials are an important and essential link between the intended and implemented curriculum in schools, and they play a vital role in how the curriculum is taught in classrooms. The learning material market in Denmark is open and dominated by private companies with no official approval system, and historically, Danish teachers have had a large influence on which materials they use. Research on the characteristics and use of learning materials is therefore of importance to researchers, policy makers and teachers. Little systematic research has been conducted into the learning materials used in Danish L1, and even internationally, research into the content and pedagogical approaches of the learning materials used is limited. This article highlights the pedagogical learning materials used in L1 in Denmark by presenting a representative survey of which learning materials Danish L1 teachers (n = 639) reported using. The listed materials (*n* = 2,132) were analysed for content and pedagogical approaches, and Danish L1 is characterized from a learning material perspective. The results show a subject dominated by a repetitive pedagogical approach as well as repetitive spelling instruction and literary analysis, which is not in line with the national curriculum.

Keywords**:** Learning materials, Danish L1, quantitative study, teaching approaches, L1 content

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Corresponding author: Jeppe Bundsgaard, Danish School of Education, Aarhus University, Tuborgvej 164, 2400 Copenhagen NV, Denmark, Email: jebu@edu.au.dk

1. INTRODUCTION

Danish L1 is by far the largest subject in the primary education system in Denmark and therefore plays an important role for all students throughout their ten years of compulsory schooling. The compulsory schooling in Denmark is called primary education and consists of the grades 0 to 9 supplemented with a 11th year that is voluntary (grade 10). Grade 0 is an introductory year and does not consist of subjects but rather of areas of competences that students must be taught. Primary education is formally subdivided into three levels: Grades 1–3 are called *indskoling* (primary school, ages 6 to 9), Grades 4–6 are called *mellemtrin* (middle school, ages 10 to 12) and Grades 7–9 are called *udskoling* (lower secondary school, ages 13 to 15). Grade 10 (age 16) is not a part of this official subdivision (Undervisningsministeriet, nd. [Ministry of Education, hereafter abbreviated UVM]). Students generally have different teachers for Danish L1 at the three different levels. There is no government determined number of lessons, but there is a minimum number that schools must at least provide (Retsinformation, 2017). In Grade 1, students have a minimum of 11 L1 lessons of 45 minutes per week, which decrease to 10 lessons in Grade 2 and nine lessons in Grade 3. From Grade 4 throughout the rest of the compulsory years, students have at least seven Danish L1 lessons per week. For comparison, for Mathematics (the second largest subject), students must have five lessons per week throughout the grades. For English, students have one lesson in Grades 1 and 2, two lessons in Grades 3 and 4 and three lessons in Grades 5–9 per week. Thus, Danish L1 is by far the largest subject in Danish primary education.

The National Curriculum for Danish L1 is competence-based and consists of four competence areas: reading, writing, communication and interpretation (UVM, 2015a). Each competence area is divided into four levels covering Grades 1–2, 3–4, 5–6 and 7–9, and each level is further subdivided into five to six more detailed descriptions of knowledge and skills. The National Curriculum includes broad subjects encompassing a wide range of competences and topic areas, from early reading, information literacy and critical discourse analysis to multimodal production, critical technological literacy and basic knowledge of Norwegian and Swedish. It further consists of reading, analysis and interpretation of literature and other aesthetic texts.

Danish L1 is considered to be a core source of students' *Bildung* (*dannelse* in Danish; Lund & Hjorth, 1996; Sørensen, 2016). Thus, the Ministry of Education stated that the subject should support the students' understanding of literature, language and communication with the aim of developing a personal and cultural identity as well as the students' aesthetic, ethical and historical understanding (UVM, 2015b).

There is a long tradition of progressive teaching in Denmark focused on experimental, project-based learning and democratic education in the tradition of Dewey (1916), the Danish progressive movement (Nordentoft, 1944) and the project-based learning movement (Berthelsen, Illeris, & Poulsen, 1985; Korsgaard, Kristensen, & Jensen, 2017). Originally based on the reform movement of the 1920s (Sørensen, 2008, p. 35ff), progressive teaching today is realized in student-centred pedagogies

like storyline (Falkenberg & Håkonsson, 2000), project-based teaching, communication-focused literacy education (Hannibal, Korsgaard, & Vitger, 2010) and writing to read (Trageton, 2004). We expect this to be mirrored in the learning materials produced for, chosen for and used in Danish schools.

Danish L1 is thus considered a progressive subject, teaching a broad set of skills relevant to life in general and providing opportunities for teachers to teach the lessons they find fruitful. Nevertheless, there has been a growing concern within the Danish L1 pedagogical research community that this is not always the case. This has been based on both qualitative (e.g., Fougt, 2015) and quantitative (e.g. Bundsgaard, Pettersson, & Puck, 2014) studies as well as more unsystematic experiences working with teachers and schools.

Since the learning material market in Denmark is open and dominated by private companies (mostly publishing houses) and there is no official approval system or guidelines on which materials to use, Danish teachers in principle are free to choose which methods and learning materials they want to use. The decision of which learning materials to purchase and use in the classroom is often made by the teacher or a group of subject teachers. In recent years, this power to purchase learning materials has been taken over by schools and municipalities to a certain extent in order to negotiate a lower price on especially digital learning materials (Rambøl, 2018).

Based on this background, we decided to complete a nationally representative survey of the Danish L1 subject to answer the following research questions:

1) Which learning materials do Danish L1 teachers report using?
2) How can we characterize the content and pedagogical approach of the materials used?
3) What characterizes Danish L1 based on the learning materials?

This quantitative study was also used to identify the most commonly used learning materials for analysis in the associated qualitative studies (see other articles in this special issue). In this article, we present the results from the quantitative study.

Throughout the article, we refer to the different Danish learning materials using their Danish title in italics followed by an English translation in square brackets the first time a material is mentioned. Thereafter, only the translated English title is used.

Previous studies

This section gives a short overview of previous studies inquiring into learning materials used in Danish L1. There have only been few such studies, and each one illustrate different aspects of the challenges that meets the researcher who wants to understand in a representative way which learning materials that are being used, and how to give a representative characterization of the content and pedagogical approaches in such materials.

A number of quantitative studies on learning materials have previously been conducted in Denmark. The relation between learning materials and actual use in class-

rooms is briefly discussed later in this article, and further elaborated in the introduction article of this special issue. These studies have addressed aspects of use of learning materials which differ slightly from the present study, either by focusing on many subjects, on one theme within a subject or on only one or a few age groups. Borstrøm, Petersen and Elbro (1999) conducted a study on early reading instruction materials used in Grade 1 in 1994. All Danish schools were contacted ($n \approx 2{,}200$), and 1,220 schools responded to the survey, but the report did not include a dropout analysis, and therefore it is difficult to assess the generalizability of the results. The focus was exclusively on early reading instruction materials for Grade 1. The report showed that the market was dominated by one particular material: *ABC Dansk i første* [*ABC Danish in Grade 1*] (Kokborg & Rosenberg, 1984), which was used by 39% of the teachers. Two other materials were used by a considerable but smaller percentage of the teachers: *Danskbøgerne* [*The Danish Books*] (Lau, Heiberg, & Pagaard, 1987) by 12% and *Alle tiders Dansk* [*Terrific Danish*] (Various authors, 1995-) by 6%.

Also in 1994, the Danish Ministry of Education published a report on learning materials for the subjects of Danish and History, where the most used materials were identified through 'key personnel' within the subject, such as consultants, members of the Danish L1 teachers' organization and researchers. Therefore, the results cannot be considered valid as a representative survey but can be seen as plausible tendency (UVM, 1994). In the 1990s, the Danish Ministry of Education initiated a quantitative study on learning materials in general (Hudtloff & Nielsen, 1995), but the results were not presented with a special focus on subjects and therefore the study does not say anything about the use of learning materials for the Danish L1 subject In 2008, the Danish Research Centre on Education and Advanced Media Materials (DREAM & Læremiddel.dk, 2009) conducted a survey among school principals and teachers, but it had a very low response rate of 10% of principals and only 68 Danish teachers (of around 25,000 potential respondents) thus resulting in a study with very low reliabilty.

In 2014, a research team conducted a survey among teachers in all subjects at 14 schools that participated in the Demonstration School Project (Pettersson, Hansen, Kølsen, & Bundsgaard, 2016). The survey had a response rate of 46% ($n = 390$). Among other things, the teachers were asked which digital learning materials they used in a number of subjects. These data were later analyzed by Gissel and Skovmand (2018), who conducted a thorough investigation of the pedagogical approach in the 107 learning materials mentioned using a typology developed by T. I. Hansen and Bundsgaard (2013): Repetitive, Instructional, Scaffolding, and Practice Scaffolding materials (we elaborate on these categories later in this article). Gissel and Skovmand's (2018, p. 44) analysis showed high utilisation of the repetitive approach in Danish learning materials: 62% of the materials were characterized as mainly using the repetitive approach, while 16% were characterized as mainly using the instructional approach and only 4% were characterized as mainly using the scaffolding and practice scaffolding approaches. As Gissel and Skovmand stressed, given the selection of schools, the survey is not done on a representative sample of Danish

schools, and therefore one needs to be careful to consider the results representative of teachers as a whole.

Also in 2014, the Ministry of Education commissioned a survey on the use of digital learning materials in all subjects (Rambøll Management & The Boston Consulting Group, 2014). A total of 477 schools were chosen to participate, and 400 principals and 1,450 (of 3,100) teachers responded to the survey. The report concluded that "Scaffolding, instructional, and repetitive digital learning materials are used to almost the same degree" (Rambøll Management & Boston Consulting Group, 2014, p. 10, our translation). Gissel and Skovmand (2018) were highly critical of the results in the Rambøl–Boston report, pointing out that the approach used in the study only allowed for coding in one of the four categories, despite the fact that materials often combine several approaches (e.g., repetitive with instructional). Together with a number of other methodological problems, the results of the Rambøll–Boston report are very much open to discussion.

A large number of research projects on learning materials have been conducted internationally, and we present only a few results from these studies. For a more elaborate literature review, see the introductory article in this special issue (Fougt, Bremholm, & Buch, 2020).

In Scandinavia, Gilje et al. (2016) conducted a large-scale mixed methods study on learning materials and their importance for teaching and learning. They concluded that teachers have a great deal of influence on the choice of learning materials, and learning materials have a significant influence on the form and content of the teaching. Furthermore, the study revealed that in primary and lower secondary schools, teachers prefer paper-based learning materials, while digital learning materials are more popular in upper secondary school.

Rodríguez, Bruillard and Horsley (2015) concluded in a recent research anthology on digital learning materials that there is a lack of research on this topic. They recommended more data-driven research, as too many studies are theory driven.
According to T. I. Hansen (2018), two recent reviews, one international and one on textbooks used in the United States, concluded that the use of textbooks is still dominant. Further, there is a general lack of research on learning materials (Knudsen, 2011; Watt, 2015 as cited in T. I. Hansen, 2018).

2. THEORETICAL FRAMING

Curricula are often referred to as either *a* or *the* curriculum, but according to Goodlad, Klein and Tye (1979), there is no such thing as one curriculum. Rather, one could define several curricula depending on the perspective in focus, and the meaning of curricula varies depending on the teachers' or students' (political) perspective. Goodlad, Klein and Tye (1979, p. 60) stated that curricula emerge from 'idealistic planning processes'. There are four main types of curricula: formal curriculum is provided and approved by authorities, perceived curriculum is dependent on teachers' and parents' views, operational curriculum is what is actually being taught in the

classroom and is 'seemingly being presented at a given moment' (Goodlad et al., 1979, p. 45) and finally, experiential curriculum is that which the students experience.

Another, simpler description is the tripartite model from the International Association for the Evaluation of Educational Achievement (IEA). Following this model, a curriculum can be defined at three levels (Houang & Schmidt, 2008). The first is the *intended level*, expressing what the authorities expect students to learn. This is often found in the form of policy papers and other official documents, in this case, the National Curriculum for Danish L1 (UVM, 2015a). This level contains the formal level found in the model by Goodlad et al. (1979). Then there is the *implemented level*, consisting of what is taught in the classroom, which includes the perceived and operational levels. Finally, the *attained level* is what the students are actually able to document that they have achieved (Valverde et al., 2002). According to Valverde et al., textbooks, or learning materials more broadly, can be regarded as defining the subject and representing it to the students. Since curriculum documents do not give specific or tangible directions on how to actually realize the intended curriculum, textbooks can be seen as translating 'a country's curriculum policies into such representations' (Valverde et al., 2002, p. 1). In other words, textbooks are made to 'serve teachers and students...[as the] links between the ideas present in the intended curriculum and the very different world of classrooms' (Valverde et al., 2002, p. 9). Goodlad et al. found that examining textbooks can be used to determining the ideal curricula, while Valverde et al. viewed them as existing in between the intended and implemented level. This latter view is also the stance used in this article.

According to Houang and Schmidt (2008, p. 3), the understanding of textbooks is 'essential to understanding the learning opportunities' that students are given in the educational system as a whole because textbooks are widely used in teaching (Sosniak & Perlman, 1990). When viewed this way, the use of learning materials in the school system is of interest to researchers as well as practitioners, political decision makers and others with an interest in teaching and learning in the school system.

Concept: Pedagogical learning materials

In a teaching situation, the teacher can use an endless number of materials to support the teaching, and as stated in the introduction, we label all of these as learning materials (see also the introduction article in this special issue by Fougt, Bremholm, & Buch, 2020). This label requires further elaboration.

Initially, we carefully considered the more commonly used English label of *textbooks*, but we decided to use *learning materials* for two reasons. First, the materials considered in this study consist of a variety of both analogue and digital artefacts, and the word textbooks connotates analogue materials specifically. Second, we build on an existing framework, developed by Danish researcher J. J. Hansen rooted in his PhD dissertation on digital learning materials (2006), to distinguish between three

different categories, namely *pedagogical*, *semantic* and *functional* learning materials.

J. J. Hansen (2010, p. 21) defined *pedagogical learning materials* as those that are pedagogically designed learning systems, such as a textbook, made with the intention to be used to teach a certain content. Their specific learning goals and activities are the result of embedded pedagogical instruction. *Semantic learning materials* are those which are brought to the classroom by the teacher with the intention of being used as a learning material but with no built-in pedagogical instructions (e.g., a newspaper article or a novel; J. J. Hansen, 2010, p. 20). Finally, *functional learning materials* are tools with no subject matter content or built-in pedagogical instructions (e.g., a laptop or a blackboard; J. J. Hansen, 2010, p. 20).

Valverde et al. (2002, p. 2) defined textbooks as reflecting 'the intention of the author', similar to what J. J. Hansen (2010, p. 21) labelled as embedded pedagogics. In this sense, we decided to use the general term learning materials. In this study, we only focus on pedagogical learning materials, and we use the term learning materials to be interpreted as meaning pedagogical learning materials.

These learning materials have both a pedagogical approach and a subject matter content and thus fulfil the same functions as textbooks. We consider textbooks to be a subcategory of learning materials, and we find that other types of learning materials (e.g., online platforms, teacher directed descriptions of teaching units, etc.) can be expected to fulfil the same functions as textbooks.

Previous research has shown that learning materials are almost always used in the classroom (Houang & Schmidt, 2008; Sosniak & Perlman, 1990; Valverde et al., 2002). According to Valverde et al. (2002, p. 1), textbooks can be said to be 'a ubiquitous element of schooling' and thereby also one of the most important elements. Both Sosniak and Perlmann (1990) and Schmidt et al. (2001) also showed that there is a significant relationship between textbook content and classroom instruction. An analysis of which learning materials are actually used in the classroom combined with an analysis of the content of these learning materials is therefore of interest as a basis for discussing the characteristics of the subject.

It is important, however, to keep in mind that this study does not reveal what actually happens in the classroom (Houang & Schmidt, 2008). That being said, combining an analysis of the content with the use of different learning materials can be *an indication* of what takes place in the classroom (Bundsgaard, Buch, & Fougt, 2017a). Teachers and students can use the learning materials in a variety of ways and thereby modify their didactic potential or intention for daily teaching, and the use of textbooks likewise has a great impact on teachers' 'instructional decision making' (Valverde et al., 2002, pp. 2, 10). According to Schmidt et al. (2001), this has been shown in different studies throughout the world.

3. METHOD AND DATA COLLECTION

In this section, we present the development of the survey that was used as the basis of the results as well as the methods used to analyse the learning materials.

3.1 The questionnaire

This present study is based on a mainly closed-answer-format questionnaire sent to a representative sample of all Danish L1 teachers for Grades 1–10 in public and private schools. Since there is no central register of all teachers teaching Danish L1 in the 2,040 Danish schools, the teachers were chosen by means of a stratified cluster sampling design (Lehtonen & Djerf, 2008). Representativeness was ensured through a stratified sampling using four different parameters that were chosen based on the available register data (school size, school form, urban/rural schools and region) following a procedure similar to large-scale, international studies by IEA and the Organisation for Economic Co-operation and Development (OECD).

The differences found between the population and the participating schools in the analyses were considered too small to influence the final results. This led us to the conclusion that according to the statistical tests, the result is representative of the overall population (cf. Russmann, Plessner, & Puck, 2016).

For the 149 chosen schools, we also selected a first and second replacement school. Schools from all three groups were selected following the same distribution key to make sure that each school and its substitutes were as similar as possible. If one school did not accept our invitation to participate in the survey, the first replacement school was contacted and subsequently the second. In one case, it was necessary to select and contact a third replacement school. After selecting the schools, contact information of all Danish L1 teachers at these schools was collected.

The questionnaire was sent out to 1,553 L1 teachers (the questionnaire can be located at sciencedata.dk/shared/lmu); of these, 639 teachers completed the survey, resulting in a response rate of 47.3%. The group of respondents was compared to available register data to test for representativeness, and it was found to be mostly representative except for a slight over-representation of women and younger teachers; 86% of our respondents were women, and according to the Danish Ministry of Education, women represented 68% of teachers in Danish schools in 2015 (uddannelsesstatistik.dk; Russmann, Plessner, & Puck, 2016). However, Danish L1 is dominated by female teachers, although the exact percentage is unclear. According to the Danish ICILS Report (Bundsgaard, Pettersson, & Puch, 2014), females represented 74% of Danish L1 teachers in Grade 8 in 2013. An evaluation report for the ministry of Education further shows that women are substantially overrepresented in especially grades 1-3, even considered the female overweight among teachers K1-9 in general (EVA, 2007)

The questionnaire consisted of several clusters of questions. First, the respondents were asked a number of background questions about the number of years of

employment as a teacher, graduation year, gender, age, etc. The next group of questions was about the use of learning materials. Here, the respondents were asked to name up to five pedagogical learning materials they had used during the last two months. Responses from this question are the main data source for the present article. If the respondent did not use pedagogical learning materials, she or he was asked to explain why. Then, the respondents were asked to estimate in percentages how much of their teaching included pedagogical learning materials and to what degree they would produce their own materials (writing texts, creating exercises, choosing fiction texts such as movies and cartoons, developing teaching units and planning a single lesson) to use in class. In the next question, they were asked to name the best learning material they knew and briefly explain their choice. The last question in this group was about their experience of having a contributory influence on the purchase and choice of learning materials.

The third group of questions was related to the teaching and learning practices in the respondents' classrooms. These questions are not used in the context of this article. The questionnaire was pilot tested several times by volunteer teachers before being sent out.

A total of 2,132 titles (the primary list) were provided for the question asking for up to five learning materials used in the previous two months, and these were standardized into 315 uniquely identified titles (the final list) by categorizing them manually. This was done because the teachers used a variety of different names and titles for the same learning material, which were then categorized as the officially known title of the material. We also categorized all titles from the same series under the series title. Of the 2,132 titles on the primary list, 114 were omitted because they were semantic or functional learning materials, learning materials from subjects other than Danish L1 or either unidentifiable or so wide ranging that we did not know which part of the material was actually used.

3.2 Development of the content categories

The coding of the content in the 315 different materials identified in the survey was based on a list of content developed for this purpose. This development was based on the content mentioned in the National Curriculum. First, we used the concepts from this standard since they are divided into four competence areas: interpretation, reading, writing and communication. However, this resulted in too broad of categories. We then attempted to use the subgoals, but this was also too detailed, as there are 23 subgoals at each grade level and over 200 knowledge and skill descriptions. Further, it would not have been possible to capture what was special about many of the teaching and learning materials using this coding.

Instead, we decided on a data-driven approach that was able to provide a palpable overview while exploring some of the nuances of these materials. In this data-driven approach, categories were proposed after analyzing a number of materials,

after which the categories were further elaborated during the analysis of the remaining materials. Thus, an iterative process was used for developing categories. The national curriculum and other official documents (e.g., Gregersen et al., 2003) as well as research articles (e.g., Gissel & Skovmand 2018; T. I. Hansen & Bundsgaard, 2013) were used to saturate and define the categories. The final instrument to describe the content of the learning materials consisted of 19 categories, as described in Table 1.

Table 1. Coding category definitions

Category	Description
Handwriting	Materials that set the stage for activities focusing on how to write by hand
Grammar	Explicit, systematic instruction on grammar without the intention to support student spelling development
Spelling	Focus on spelling and spelling rules, including hyphenation, literacy, syllable division, grammatical endings, etc.
Lexical competence	Focus on idioms, synonyms, antonyms, words and concepts in order to develop students' lexical competence and vocabulary
Reading instruction	Focus on how to read, including the introduction of letters, phonetics, pronunciation rules, phonemes and morphemes, rhyming, etc.
Reading practice	Materials with a focus on reading quantity or speed For reading that is part of or preparation for analysis of literary texts, see literary analysis
Reading strategies	Focus on how to read (mono- and multimodal) texts according to their linguistic form and structure and how their information is organized Includes focus on genres related to non-fiction texts
Multimodal reading	Focus on the relationship between text and images (and other modalities), where there is not a primary focus on information decoding (as in reading strategies), for example, in commercials, advertising, computer games, cinematic effects, etc.
Writing instruction	Focus on how to write words and sentences to practice writing in the context of reading instruction Could also include focus on text structures (e.g., by filling out plot or actant models) Includes short texts (e.g., fill in the blanks) For writing longer coherent texts with greater focus on substance rather than structures, see written composition
Written composition	Focus on how to write coherent texts, including giving and receiving feedback For the production of fictional texts, see literary composition
Multimodal composition	Focus on how to write coherent, multimodal texts focusing on layout, image use, design and interaction between modalities, including the production of websites, drawings, etc.
Literary composition	Focus on how to write or produce fictional texts, including movies and comics
Literary analysis	Focus on analysis and characterization of literary texts, including movies and comics Includes reading of literary texts in preparation for analysis and interpretation (not categorized under reading instruction)

Literary interpretation, evaluation & discussion	Focus on understanding and relating to literary texts, including movies and comics Includes suggestions for philosophical or sociological discussions in relation to reading or watching fictional texts
Art reading	Focus on analysis and interpretation of visual art, such as paintings, sculptures, etc.
Media	Focus on media and media use (e.g., working with television and newspapers as practice and institutions, for instance journalism) For reading texts from various media, such as newspapers, see reading strategies or multimodal reading
Orality	Focus on orality and the awareness of the use of orality (e.g., in education), including drama exercises and theatrical performances
Communication analysis	Focus on (critical) analysis of text and communication situations, including on argumentation in practice For production of argumentative texts, see written composition
Scandinavian languages	Focus on Swedish and Norwegian languages (e.g., vocabulary, differences in languages and non-fiction texts in the two other Scandinavian languages) Reading with the aim of understanding the language rather than reading literature For a combination of understanding language and reading, analyzing or interpretation of a literary text, see both or all categories

3.3 The categories for the pedagogical approach

As previously mentioned, we also wanted to identify the pedagogical approach used in the learning materials. We define a pedagogical approach as the way in which students are introduced to the content, how the teacher and students are positioned and how the students are instructed to work with the content and assignments. We based the coding categories for the pedagogical approach on the work of T. I. Hansen and Bundsgaard (2013), which was further developed and refined by Gissel and Skovmand (2018). During the analysis of the pedagogical approach, we identified a category not detected by these authors. We named this category the *product-oriented approach*. The resulting five categories of pedagogical approaches are described in Table 2.

In a *repetitive approach* the focus is on training of what is considered "basic skills", typically of a technical, and procedurally simple kind. This could be spelling, identifying grammatical traits, differentiating between types (e.g. of metaphors, text genres, stylistic traits, and so on), or more advanced activities like describing the characters, the milieu, and theme of a short story. Repetitive learning materials in that sense materializes the IRF-structure known since the classroom studies of Sinclair and Coulthard (1975), where the learning material initiates by asking a closed question, the student responds, and the learning material or the teacher evaluates or gives feedback on the quality of the response.

Table 2. Pedagogical approaches

Approach	Description
Repetitive	Students fill in blanks, draw relations between images and text and choose between options. The tasks are often decontextualized and closed, with one correct answer. The objective is to make the students learn routines or memorize facts.
Instructionist	Content is presented for the students to read, watch or listen to, and often the teacher is expected to go over the content and explain it in a lecture.
Product-oriented	Students learn to produce longer (mono- or multimodal) texts as part of their work on the content or topic and are often asked to give their individual take on the topic.
Scaffolding	Students are supported in learning the content and mastering the skills through the use of templates, model texts, inspirational questions and the introduction of concepts in close relation to their use.
Practice-scaffolding	Students learn to solve real-world problems in real-world settings (e.g., by playing roles or communicating with stakeholders). The learning material scaffolds this process by providing help with organizing collaboration; structuring the phases; and introducing relevant concepts, procedures and content when needed.

Repetitive learning materials will often implicitly or explicitly be based on a behaviourist theory of learning (Sawyer, 2006b), but more updated theoretical basis are found e.g. in the theory of direct approach to instruction (Huitt, Monetti, & Hummel, 2009). According to the direct approach, teaching should consist of four phases (ibid., p. 81): 1) Presentation of content and skills to be learned, 2) practice of the skills, first under the teacher's supervision, then more independently, 3) an assessment and evaluation phase, and 4) a monitoring and feedback phase that runs alongside the first three phases.

Learning materials can play a core part in each of these phases, but often they will be focused on giving input in the form of questions and tasks in the practice of skills-phase.

The *instructionist* approach, a term coined by Papert (1993), is described by Saywer (2006b, p. 1) as the traditional vision of schooling, designed around common-sense assumptions like knowledge as a collection of facts and procedures, the goal of schooling being to get these facts and procedures into the students' heads; that teachers know these facts, and that their job is to transmit them, that simpler facts should be learned first, and that success of schooling can be assessed as the number of facts and procedures acquired by students.

Instructionism is therefore teacher-centred and focused on the teacher giving lectures or directing whole-class dialogues about subject matter or skills to be learned. Instructionist practices often take the form of a Lecture–Recitation–Seatwork–Plenary-process (Bundsgaard, 2010) where the learning materials can provide reading and instruction material as a supplement to the lecture, and questions and tasks for the seatwork.

Common textbooks and systems of learning materials are often designed to support this kind of practice.

The *product-oriented* approach was identified in the analysis of learning material in this project and is a fifth category not defined by T.I Hansen and Bundsgaard (2013) or Gissel and Skovmand (2018). This approach is characterized by giving the students tasks of producing written as well as multimodal texts, and possibly supporting them by providing inspirational material, step-by-step-descriptions of research for information or organization of the text, templates to fill out, instructions for the use of tools and so on. This approach is an extension to the instructionist approach, where students are asked to show that they can understand and enact the knowledge and skills they were intented to learn. In this approach, students should demonstrate that they are able to solve 'school'-like tasks independently. Thus, the approach has its origin in the same teacher-centered practice but recognizes the need for students to demonstrate that they can work independently on their own using the new skills.

The *scaffolding* approach builds on the constructivist understanding that learning takes place when the student is working in the proximal zone of development (Vygotsky, 1978), and that it is therefore beneficial to build a *scaffold* which helps recruit the student's attention, reduce the degrees of freedom, maintain direction, mark critical features, control frustration and demonstrate solutions (Wood, Bruner, & Ross 1976). Learning material for example scaffolds by outlining the steps the student should follow or by providing the knowledge needed in a well-defined problem-solving process. Scaffolding can also take place by giving examples that the student can mimic or build her own answer up around.

As will become clear in the results section, the last type of pedagogical approach, which we call the *practice-scaffolding* approach is only visible in a very small amount of learning materials used by Danish teachers. Nonetheless, we included it in our analysis because of its prominent role in theory of teaching and learning (Saywer, 2006a), and because we find it a highly relevant and important result that there are only few Danish learning materials supporting this teaching and learning approach. While *scaffolding* can take place in highly structured, linear teaching practices, *practice scaffolding* takes place in ill-structured situations where the students are expected to articulate problems, formulate research questions, perform research, build or construct models and real-world products etc. In such teaching and learning practices there is a tendency to give students too little support and instruction (Gregersen & Mikkelsen, 2007; Barron & Darling-Hammond, 2010).

But in presentation of instructional design approaches like experiential learning, and problem and project-based learning it is advised that students are scaffolded in their inquiries and authentic real-world problem solving processes (Savery, 2009; Lindsey & Berger 2009; Barron & Darling Hammond 2010). Teaching material can handle these tasks in different ways, e.g. by pointing out steps in a problem solving process (*sequencing* (Collins, 2006)), support collaboration (Bundsgaard, 2019), give

visual feedback in interactive tools, elicit the students' reflections on essential aspects of the theme in question (*articulation* and *reflection* (Collings, 2006)) etc.

3.4 The coding process

After the content categories were determined, the materials were analyzed by one or more coders. The group of coders consisted of the authors of this article and two master's students trained for the task. The coders primarily worked in pairs at the library at the Danish School of Education, where most Danish analogue learning materials were available. The digital materials were available either by using free test accounts or through access provided by the publisher selling the material. In cases of doubt, the coders discussed the categorization, and some of the materials were coded independently by two or more coders in order to ensure consistency in the coding. This double coding showed a high degree of consistency, and combining this with the fact that the coders physically coded together secured a high degree of uniformity in the coding. Each material was coded for both the content using the content categories developed and for the pedagogical approach using the categories described in the theoretical part of this article. Both codings were done at the same time by the same coder to secure uniformity.

We used different approaches for the analyses depending on the form and modality of the material. For analogue materials, we typically looked more closely at every third page to describe the content and pedagogical approach, while digital platforms were analyzed by examining every second or third teaching unit from the suggested annual plans. The approaches are more closely described in the article by Bundsgaard, Buch, & Fougt (2017b).

When analysing the material, we used two different methods to indicate the number of content categories and pedagogical approaches. Because learning materials could consist of a single type of content or a combination of content from different categories, we decided to estimate the distribution of content from different categories in percentages based on our analysis of each of the pages. Further, we concluded that the pedagogical approaches were not always present in certain parts of the material, but they could exist side by side to a certain degree. We therefore used the approach introduced by Gissel and Skovmand (2018) to characterize the extent to which each of the pedagogical approaches was present on a scale from 0 (not present at all) to 3 (present to a very large extent), where 2 means that it is present to a certain extent and 1 to a small extent.

3.5 Statistical methods

In this section, we briefly describe the statistical methods used. For further details, please consult the background report (Russmann, Plessner, & Puck, 2016).

Since the study was based on a stratified cluster sample design and the response rate varied between schools and respondents, the results were adjusted using

weights. In a cluster sample design, each respondent speaks for a group of similar respondents, and weights ensure the representation is adjusted according to the participation rate. We used weights to adjust for the representation of each school, which was calculated as the inverse of the probability of that school being randomly selected. This weight ranged from 7 to 20. To adjust for the participation rate, we calculated the inverse of the participation rate in the stratum, and this weight ranged from 0.667 to 4.000. The same was done for the participating teachers, although only the second weight was calculated (since the probability of being randomly selected as a teacher from that school was 100%). The numbers for this second weight varied between 1 and 7. Finally, only respondents who completed the survey were counted, and this was also adjusted with the final weight. The total weight was a multiplication of all of the above-mentioned weights. Further, since each respondent could (but did not have to) mention up to five different learning materials, to avoid responses of four of fewer materials having too much weight, each response was adjusted for the number of learning materials mentioned. Finally, Jackknife replicate weights were used to adjust the standard error. Based on these weights, the results are representative of the total population of Danish L1 teachers.

To calculate the correlations, we used Spearman's (1904) rank correlation, which is appropriate for discrete ordinal values. If the value of Spearman's rank correlation is 1, this indicates a perfect correlation, meaning that when one of the factors changes, the others change at the same rate.

4. RESULTS

In this section, we present the main results from the study. The results are presented in three sections: materials used, characteristics of the materials and correlations in content.

4.1 Materials used

As stated in the introduction, the goal of the quantitative study was to identify the most used learning materials for further analysis in the qualitative studies (see other articles in this special issue). The 10 most used materials in each grade level are listed in Table 3.

The results showed that a few materials dominated at each level. For Grades 1–3, a phonics-based reading instruction material, *Den Første Læsning* [*The First Reading*] (Borstrøm & Pedersen, 1999-), was used by 21% of the teachers (see Bremholm, 2020, this special issue). The second-most popular material was another phonics-based reading instruction material, *Fandango* (May & Arne-Hansen, 2007-), which was used by 12% of the teachers (see Rørbech & Skyggebjerg, 2020, this special issue). Three spelling instruction materials were used by a total of 7% of the teachers: *Stav* [*Spelling*] (P. E. Jensen & Jørgensen, 2001-), *Stavevejen* [*The Spelling Path*] (M. B. Jensen & Jensen, 1997b-), and *Sikker Stavning* [*Confident Spelling*] (Juul, 2008–

2014) (see Kabel, 2020, this special issue). Two digital platforms were used by 4% of the teachers: *dansk.gyldendal.dk* [*Danish.gyldendal.dk*] (Gyldendal, n.d.) and *Danskfaget* [*The Danish Subject*) (Clio Online, n.d.) (see Berthelsen & Tannert, 2020, this special issue). Overall, these results can be seen as an indication that Danish L1 in the first three grades is focused on spelling and the technical aspects of reading.

Table 3. The 10 most used materials in each grade level.

Grades 1-3		Grades 4-6		Grades 7-9	
Learning material	%	Learning material	%	Learning material	%
Den første læsning [The First Reading]	21	*Fandango*	14	*dansk.gyldendal.dk*	19
Fandango	12	*dansk.gyldendal.dk*	8	*Danskfaget*	7
STAV—Indskoling [Spelling Grades 1-3]	3	*Danskfaget [The Danish Subject]*	6	*Vild med dansk [Crazy about Danish]*	4
dansk.gyldendal.dk [Danish.gyldendal.dk]	3	*Dansk direkte [Danish Directly]*	5	*Gyldendals webprøver [Gyldendal's Web Tests]*	4
Stavevejen [The Spelling Path]	3	*STAV—Mellemtrin [Spelling Grades 4-6]*	4	*Grammatip*	4
Skrivevejen [The Writting Path]	2	*Den sikre læsning [Confident Reading]*	3	*iSkriv.dk [iWrite.dk]*	3
Sikker Stavning [Confident Spelling]	1	*Stavevejen*	3	*Stavevejen*	2
Danskfaget [The Danish l1 Subject]	1	*Grammatip [Grammar Tip]*	3	*Sådansk [How to Danish]*	2
Min ... Danskbog [My … Danish Book]	1	*D'dansk [This is Danish]*	3	*Dansk i dybden [Danish in Depth]*	2
Søren og Mette [*Søren and Mette]*	1	*Min ... Danskbog*	2	*Fandango*	2

In Grades 4–6, the learning materials were more diverse. The most used material was *Fandango* (used by 14%), which at this level mainly focused on teaching literary analysis. The same two digital platforms mentioned earlier were used by a total of 14% of the teachers (*Danish.gyldendal.dk* and *The Danish Subject*) and presented a broader approach to the subject with a focus on literary analysis. Three textbook systems were used by a total of 10% of the teachers: *Dansk Direkte* [*Danish Directly*] (Hare, 2004-), *d'dansk* [*This is Danish*] (Bülow-Olsen, Harms, & Skaarup, 2009-.) and *Min...danskbog* [*My…Danish Book*] (Rørup, 2005-). Additionally, 10% of the teachers used spelling or grammar materials at this level, including *Spelling*, *The Spelling Path* and *grammatip.com* [*Grammar Tip*] (Ordbogen A/S, n.d.).

In Grades 7–10, the most used material was the digital platform from the publisher *Gyldendal* (*Danish.Gyldendal.dk)* (19%), followed by the digital platform from

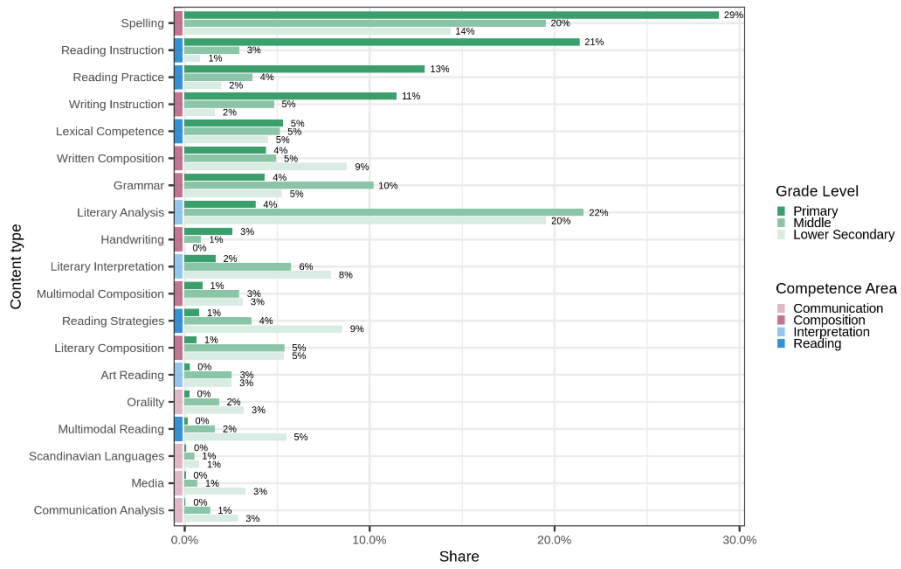
Clio Online (*The Danish Subject*) (7%). These platforms provide rather broad approaches to Danish L1, but with a focus on literary analysis. Five systems (analogue and digital) were used by a total of 13% of the teachers: *Vild med dansk* [*Crazy about Danish*] (Ammitzbøll, Østergren-Olsen, & Poulsen, 2007–2009), *iSkriv.dk* [iWrite.dk] (Novovic, Qvist, Jensen, & Jensen, 2011–2017), *Sådansk* [*How to Danish*] (M. B. Jensen & Jensen, 1997a-), *Dansk i dybden* [*Danish in Depth*] (Various authors, 2006-) and *Fandago* (see Rørbech & Skyggebjerg, 2020, this special issue). The platform *webprøver.dk* [*Web Tests*] (Dinesen, n.d.), which provides access to assignments in line with final exams, was used by 4% of the teachers. Additionally, 6% of the teachers used the spelling and grammar materials (*Grammar Tip* and *The Spelling Path*).

As stated in the introduction, the decision on which learning materials to buy in Danish schools can be made by a number of different parties: the individual teachers themselves, groups of subject teachers and librarians at the schools' media centre. In recent years, it has become more prevalent for municipalities to purchase digital platforms for all their schools in order to get a discount. The latest Danish data show that this approach is dominant today (Rambøll, 2018). This could mean that teachers are not satisfied with the learning materials at their disposal. However, when asked what they considered the best learning materials, they demonstrated to a large degree that the best materials were the ones most used (data was collected in autumn 2015). The preferred material came from the digital platform *Danish.gyldendal.dk*, which was chosen by 28% of the teachers, *Danish.gyldendal.dk* spans all 10 grade levels and uses a broad approach to the subject. *Fandango*, which is also available for all 10 grade levels, came in second, preferred by 22% of the teachers. *Fandango* is focused on reading in the first three grade levels and on literary analysis in the remaining grade levels. *The First Reading*, a phonics-based reading instruction material that is only available for Grades 1–3, came in third, chosen by 15% of all Danish teachers. The learning materials that the teachers considered to be the best were also the ones that were most commonly used, dismissing the idea that teachers are forced to use material they do not find suitable for their task.

4.2 Characteristics of the materials

The account of the learning materials used makes it possible to characterize the subject of Danish L1 (please refer to Section 5.1 to understand the limitations of the study and the precautions needed when making conclusions based on the following analyses). In order to thoroughly describe the content and pedagogical approaches in Danish L1 based on the learning materials, we analyzed the content and pedagogical approaches of all 315 different materials mentioned by the teachers using our self-developed content categories and the categories for the pedagogical approach. The results are presented in Figures 1 and 2.

Figure 1. Content in learning materials for all three grade levels.



Note: Histogram shows the share of total space for the learning material used for each content type grouped at the three levels (primary, middle and lower secondary). The learning materials are weighted based on use. The content types are ordered based on share in the primary level from highest to lowest. The blue and red rectangles at the base of the bars represent the competence area that the content belongs to.

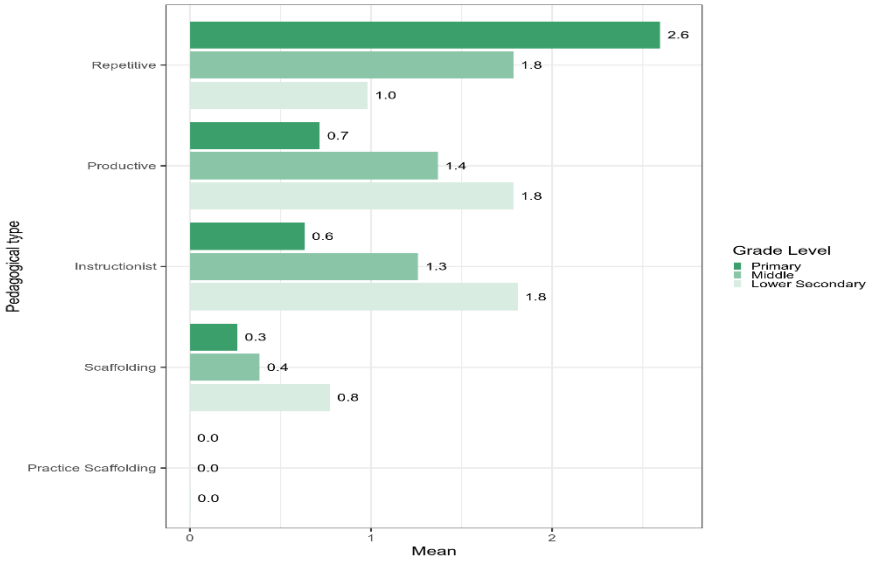
The analyses show that in Grades 1–3, spelling and learning to read and write dominate. Spelling accounts for 29% of the content, making it the most dominant category in these grades. The spelling content mainly consists of repetitive and decontextualized training of word spelling. Spelling instruction is often combined with writing instruction (i.e., practicing how to write words and sentences, often in the context of reading strategies). When combined, the total percentage of the content focused on spelling and writing instruction is 40%.

The second largest content area in grades 1-3 is reading instruction (21%). Reading practice (as is often the case in the learning materials) accounts for 13%, and the two combined account for 34% of the content. Phonics-based reading instruction is by far the most used approach, with very few examples of more socio-cultural approaches (e.g., writing to read, enculturation approaches, etc.).

The rectangles along the Y axis show which competence area each content type belongs to. The coding scheme had more categories for composition and reading than for communication and interpretation, and composition and reading were the most prevalent content categories. The content types for the areas of reading competence and composition dominated the primary level. For the middle level, focus

shifted to the area of interpretation, but both reading and composition levels remained high (the content types in the reading competence area shifted towards reading strategies and multimodal reading). It is interesting to note that the four content types in the area of communication competence were among the five least prevalent types.

Figure 2. Pedagogical approaches at all three grade levels.



Note: Histogram shows the mean value of the learning material used, with each pedagogical type grouped at the three levels (primary, middle and lower secondary). The learning materials are weighted based on use. The pedagogical types are ordered based on share in the primary level from highest to lowest.

With an average of more than 2.5 out of 3 (cf. Gissel & Skovmand, 2018 mentioned in Section 3.4), the repetitive pedagogical approach (cf. Figure 2) dominated the learning materials. This approach requires students to find the correct answer to tasks based on context or to follow predefined procedures. Combining the content and pedagogical approach, we find that most learning materials in Grades 1–3 are predominantly characterized by repetitive training tasks aimed at teaching reading as well as writing letters and single words in a decontextualized situation.

For Grades 4–6, we found that the dominant content was literary analysis, spelling and grammar with 22%, 20% and 10%, respectively (cf. figure 2). Working with literary texts, traditionally seen as the main content of Danish L1, does have a more prominent place in Grades 4–6 compared to Grades 1–3, but spelling and grammar were more prevalent. Please note that we differentiated between literary

analysis and literary interpretation, evaluation and discussion. Learning materials focused on the latter only accounted for 6%. This indicates that the main focus is on describing and characterizing literary texts rather than on understanding, interpreting and discussing the existential questions arising from those texts.

The reading and writing instruction in Grades 4-6 shifts towards more focus on reading strategies and the composition of texts, both fiction and nonfiction, and also to a certain extent multimodal texts. At this level, the pedagogical approach shifts towards a more instructional and product-oriented approach, both with a mean code of around 1.25 (cf. Figure 2). However, the repetitive approach still dominates, with a mean code of around 1.75. Overall, the learning materials in the middle grades (4–6) can therefore be characterized as more diverse than in the first three grades, with more focus on literary analysis as well as production- and instruction-oriented approaches.

In Grades 7–10, there is slightly more focus on literary interpretation and less on spelling and grammar, the latter of which account for 19% (cf. Figure 2). Furthermore, the learning materials' coverage of content areas becomes more diverse, with an increased focus on reading strategies and written composition (with 9% each) and a visible but small focus on multimodal reading (5%) and different communication aspects (orality, media and communication analysis, with 9% total).

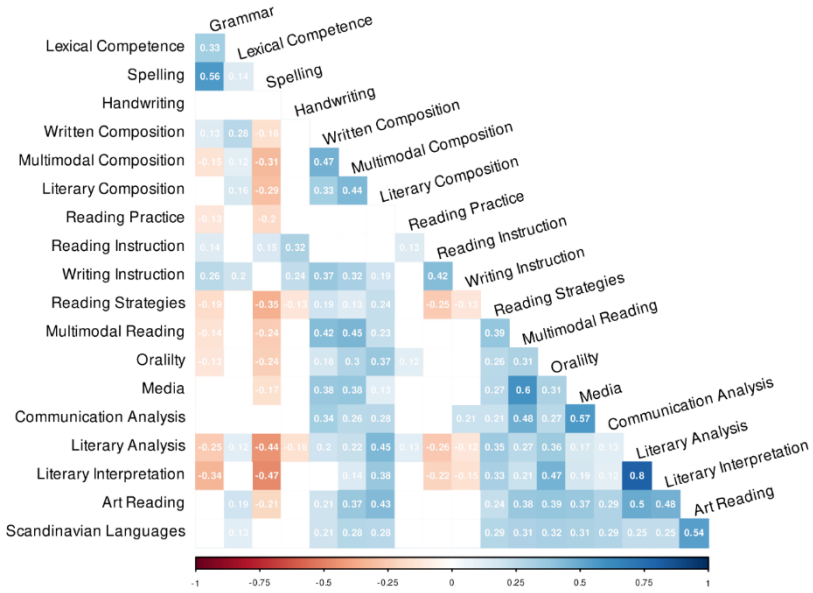
At this level, the pedagogical approaches shift away from the repetitive approach (a mean of less than 1.0) and towards a production-oriented and instructionist approach (both with means of around 1.75). Furthermore, the scaffolding approach becomes more prevalent but still remains the smallest of the four (around 0.75). Overall, the learning materials in the upper grades (7–10) can be characterized as more diverse, with more variation in the pedagogical approaches, but a focus on literary analysis remains. The number of practice-scaffolding approaches was observed so low at all three levels that it could not be shown in the Figure 2.

4.3 Correlations in content

In order to gain a deeper understanding of the characteristics of the analysed learning materials we investigated organization of the content areas by looking at the correlations between the different content areas using Spearman's (1904) rank correlation (see Section 3.5). The results are shown in Figure 3. Higher positive correlations have a saturated blue colour, higher negative correlations are in saturated red and insignificant correlations are left blank.

Initially, this analysis was conducted in three stages (Grades 1–3, 4–6 and 7–10), but in the grouped analysis, fewer correlations were statistically significant. The tendencies described below were similar for all stages, although with slightly stronger correlations in Grades 4-10.

Figure 3. Spearman's rank correlation between content categories.



First, we noticed that there was a strong positive correlation between spelling and grammar. Second, there was a negative correlation between spelling and grammar together compared to almost all other content areas, meaning that spelling instruction is only related to grammar and is isolated from most other content areas besides reading instruction where there was a small but significant positive correlation between spelling and reading instruction. These results could indicate that the general approach in Danish L1 is a traditional instructionist approach that focuses on one subject area at a time and considers it out of context.

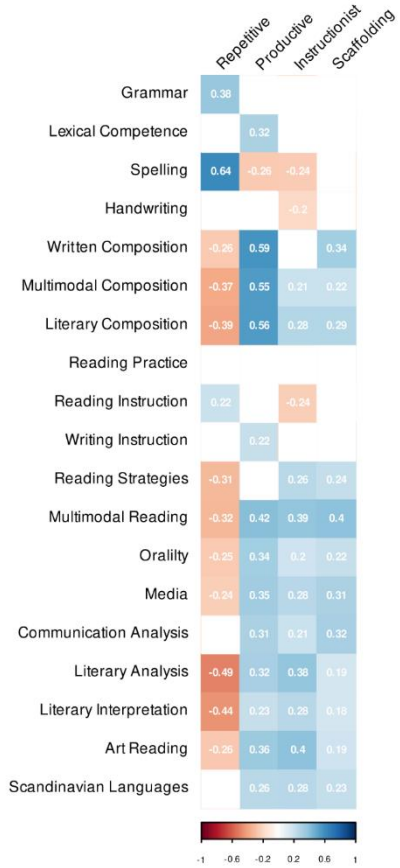
A positive significant correlation was found between reading instruction and writing instruction, which could indicate a shift towards a more integrationist approach along the lines of modern literacy theories (Berge, 2005; Gee, 2015; Graham & Hebert, 2010). However, there was no significant correlation between reading instruction and written composition. Written composition focuses on students writing longer coherent texts, while writing instruction focuses on words and sentences to practice writing in the context of reading strategies. Multimodal composition was not significantly correlated with reading instruction or reading training, either. This supports the hypothesis that Danish L1 uses a prevalent, traditional, instructionist approach in its reading instruction.

This is further consolidated by the significant correlation between reading instruction and reading strategies, and even more so when observing the non-significant relations between reading instruction and writing instruction on the one hand

and literary analysis and literary interpretation on the other. This suggests that even though there are many fiction texts in the early reading instruction material, a literary focus is not common.

Regarding reading strategies, there was a positive, significant correlation with written, multimodal and literary composition, indicating that there is a more prevalent integrationist literacy approach in the higher grades. Some of the strongest correlations were seen between literary analysis and literary interpretation as well as between these two subjects and the reading of art. Furthermore, there were rather strong correlations between these content areas and literary composition. Thus, working with literary texts seems to focus on an integrated combination of analysis, interpretation and writing of literature. Nevertheless, analysis is by far the most prevalent area of the three.

Figure 4. Spearman's rank correlations between pedagogical approaches and content categories.



On the rare occasion that communication analysis and media are addressed, this is usually done in connection with each other and with reading strategies, multimodal reading and oracy. Figure 4 presents the results of an analysis of Spearman's rank correlations between the pedagogical approaches and content categories.

First, we noticed that spelling was strongly positively correlated with the repetitive approach and negatively with the productive and instructionist approaches, indicating that spelling is taught almost exclusively in a repetitive way, and as explained above, in isolation from other content areas. Grammar and reading instruction were also significantly positively correlated with the repetitive approach, while most of the remaining content areas were negatively correlated with the repetitive approach. Further, many of the remaining content areas were also positively correlated with the productive, instructionist and scaffolding approaches. This points to a clear distinction between the three areas that correlated with the repetitive approach (grammar, spelling and reading instruction) and the rest of the content areas in Danish L1.

5. DISCUSSION

In this article, we presented a survey on which learning materials Danish L1 teachers use, and we characterized the content and pedagogical approach of these materials. Our study shows that analysing learning materials by categorizing the content and using quantitative methods can provide valuable insights into Danish L1. Before discussing our main results, we must first bring a number of limitations of the study to the reader's attention.

5.1 Limitations

The analysis does not provide direct knowledge about what takes place in the classrooms. Teachers use the materials in very different ways. Some follow the plans and instructions given in the learning materials (and their students might do the same to some extent), while others choose specific texts, assignments and suggestions from the materials (Gilje et al., 2016; Kolbeck & Röhl, 2018). Still others integrate various learning materials, and some never use pedagogical learning materials (around 15 percent of the respondents in this survey used learning materials between 0 and 25 percent of the time). Our assumption is, however, that the learning materials reported to be used by the teachers can be considered an indication of what actually occurs in the Danish L1 classrooms (see the introductory article of this special issue, Fougt, Bremholm, & Buch, 2020). This assumption is supported by the fact that more than 50% of the teachers reported that they use learning materials more than half of the time in class (and an additional one-third reported that they use them more than 25% of the time in class). Nonetheless, our results call for more in-depth research into how learning materials are actually used and interact with other artefacts and actors in the classrooms.

There are four issues related to quantifying the characteristics of the content and pedagogical approaches in such diverse pedagogical learning materials. First, the coding depends on rather subjective interpretations. As reported in the Methods section, we took every measure to explicate the coding criteria and to reach agreement on the coding, and we have published the guides used as well as the coding of the individual learning materials online (See sciencedata.dk/shared/lmu). We encourage other researchers to verify or challenge our work.

Second, determining the percentage of different types of content based on the extent to which it is present in a learning material does not provide the entire picture. Given that content is a very broad concept, different types of content could take up different amounts of space while still being present to the same extent (for example, compare a theoretical concept and a historical phenomenon). In our coding, we assigned percentages mainly based on how much space the content takes up and not on an analysis of what it would mean in the lives of the students. The same goes for the pedagogical approach, where we tried to identify how prevalent the five different approaches were. When we added up numbers, split up different grade levels and took the mean, we assumed that the numbers were comparable and interval scaled and that these kinds of calculations were meaningful. We encourage others to take these analyses into careful consideration and come up with more appropriate statistical methods to deal with the characteristics we have identified. All data are accessible at sciencedata.dk/shared/lmu.

Third, we made sure to discuss the extent of the learning materials and not time spent on those materials. However, it is natural to conclude that extent corresponds to time spent, and we hypothesize that there is a correlation between these two.
Fourth, learning materials were considered to be one unit no matter how comprehensive they were or how they were used. We do not actually know if a learning material is used every day of each week or if it is just used in one lesson a month. We think this is an important possible source of error, but we did expect this to be addressed to some extent by the way we asked the question: 'Which learning materials have you used during the last two months?'

The percentages of the total content presented in the analyses are at best a very vague estimate of the time spent, and they therefore cannot be expected to be directly comparable. We therefore urge our readers to be careful not to state findings, as these results merely support our hypothesis rather than presenting final conclusions.

5.2 What is Danish L1 according to the learning materials?

In this article we have addressed the following research questions:

1) Which learning materials do Danish L1 teachers report using?
2) How can we characterize the content and pedagogical approach of the materials used?
3) What characterizes Danish L1 based on the learning materials?

As for the first research question, 1) *Which learning materials do Danish L1 teachers report using?*, we have listed the ten most popular materials for the three levels (indskoling, mellemtrin and udskoling) in Table 3. We have found that a few learning materials are dominating the market since the difference between the most used materials and the materials in the lower half of top ten is large, the materials in the lower half of top 10 are being used by only 1-2 % and the top 3-materials are used by 14-21 %. It appears that the learning materials that teachers considered the best are also the ones that are used the most, and teachers have a significant influence on which materials are used.

As for the second research question, 2*) How can we characterize the content and pedagogical approach of the materials used?*, we conclude, keeping the limitations of the study in mind, that the study supports the following assumptions: According to the learning materials used, Danish L1 teaching has a strong focus on spelling and grammar based on the repetitive approach and is often decontextualized from teaching other content. This is especially the case in Grades 1–3, while in Grades 7–10, the focus shifts to some extent to literary analysis. Furthermore, in the first three grades, reading is taught mainly in the tradition of the phonics approach.

The analyses showed that in Grades 1–3, spelling, learning to read (phonics based) and writing dominate, with the repetitive approach being used to a large extent. In Grades 4–6, we found that the dominant content is teaching literary analysis, spelling and grammar, with the repetitive approach still being used to a certain extent as well as the instructional and product-oriented approaches. In Grades 7–10, we observed more focus on literary interpretation and less on spelling and grammar. Furthermore, the learning materials' coverage of content areas becomes more diverse, and the pedagogical approaches shift towards the production-oriented and instructionist approaches.

Our correlation analysis showed that spelling and grammar in particular had significant negative correlations with almost all other content areas. We identified significant positive correlations between the different analysis areas, but the areas were generally small.

Finally, the third research question, *3) What characterizes Danish L1 based on the learning materials,* we find several interesting points. Given that only a few learning materials focus on media, communication and the reading and composition of multimodal messages, Danish L1 does not seem to focus on preparing students for a life in a highly globalized, networked society in which communication occurs through digital technologies and commercial, political and religious institutions and movements attempt to influence and manipulate consumers and citizens.

Furthermore, even though there is a vast amount of learning material on literary texts, especially in Grades 7–10, it seems that there is more focus on analysis and reading than on interpretation, evaluation and discussion of literary texts. This basically challenges the common belief that Danish L1 is a subject where *Bildung* takes

place. The results showed a subject dominated by the repetitive pedagogical approach, with content mainly consisting of repetitive spelling instruction and literary analysis. This focus is not in line with the written curriculum.

If these assumptions are true, there is a disparity between the subject being empirically described through its learning materials and the definition of the subject in the national curriculum. As mentioned earlier, the Danish Ministry of Education (UVM, 2015a) stated that L1 should support the students' understanding of literary texts, language and communication as sources for developing personal and cultural identity as well as students' aesthetic, ethical and historical understanding. This is not reflected in the learning materials used, and this challenges the common notion that Danish L1 is a subject in which *Bildung* occurs as well as the recommendations found in learning theories (e.g., Sawyer, 2006a). Given that the repetitive and instructionist approaches are so prevalent in the learning materials, we think it is reasonable to be concerned that these pedagogical practices are far more prevalent in the Danish L1 subject than what is recommended in learning theories (e.g., Sawyer, 2006a). We believe that the support given for the hypotheses in this paper calls for more research to gain a deeper and broader understanding of and reasons for the practices in Danish L1.

6. CONCLUSION

This article presented results from the first systematic and representative survey on learning materials used in Danish L1 based on a stratified cluster sampling design (Lehtonen & Djerf, 2008). The project solely considered pedagogical learning materials (J. J. Hansen, 2010), as we had reason to believe that they were dominant in the classrooms (cf. Houang & Schmidt, 2008; Sosniak & Perlman, 1990; Valverde et al., 2002). This assumption was confirmed in the survey. As stressed in this article, the content of the learning materials is not equivalent to what is actually practiced in the classrooms, although research suggests that there is a close connection (Schmidt et al., 2001; Sosniak & Perlmann, 1990). Our assumption is that the learning materials used can be considered an indication of what takes place in Danish classrooms but not what is actually done.

We pinpointed four issues related to this kind of research: The coding and percentages were based on subjective interpretations. We focused on extent, not time spent. Finally, learning materials were considered as one unit no matter how comprehensive they are or how they are used.

In this article, we presented a method that allowed us to gain a much deeper understanding of the *implemented curriculum* of the Danish L1 subject than we had before. The analyses provided us with a number of surprising insights into Danish L1, which would be interesting to compare with similar analyses of L1 in other countries. It would also be interesting to gain more knowledge of what actually occurs in the classrooms when the materials are used.

Finally, as indicated in the data collection and analysis section, we gathered more data than was presented here. Future studies could make comparisons on the use of learning materials between less experienced and more experienced teachers, based on the year of graduation or in conjunction with the learning practices in the respondents' classrooms. All datasets are available at sciencedata.dk/shared/lmu, and we invite other researchers to use the data to conduct their own analyses.

LEARNING MATERIALS REFERRED TO IN THE ARTICLE

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