



Article

Sparse and Selective: Digital Responsibility Practices in Lower Secondary English Classrooms in Norway

Kaja Granum Skarpaas

Oslo Metropolitan University - OsloMet

Email: kajagranum.skarpaas@oslomet.no

Katherina Dodou

University of Oslo

Email: katherina.dodou@ils.uio.no

Abstract

Despite broad agreement that schools should support students in becoming digitally responsible citizens, research suggests that this dimension of students' digital competence remains underdeveloped, even in highly digitalised educational settings. Addressing this issue, the present study explored the prevalence and characteristics of digital responsibility practices in Norwegian lower secondary schools' English classrooms. Utilising a tracing comparative logic, it examined classroom practices over time, following the same student cohorts across Grades 8 and 10 (ages 13–15). Video recordings from 63 naturally occurring English lessons and 9 teacher interviews were quantitatively and qualitatively analysed. The findings indicate that digital responsibility was the least prevalent dimension of digital competence across both grades, with teachers rarely seizing opportunities for students to gain insight into – or to reflect on – digital responsibility and seemingly de-prioritising progression across grades. Instead, digital responsibility instruction primarily occurred in response to student queries and was often overshadowed by the teaching of functional digital skills. The findings suggest the need to support English teachers in better integrating digital responsibility into classroom practices.

Keywords: Digital competence, digital responsibility, English language teaching, lower secondary schools, mixed methods



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Introduction

While increasing numbers of children worldwide use digital technology daily, their digital competence has not improved accordingly (Fraillon, 2024). The International Computer and Information Literacy Study (ICILS) suggests that students' digital responsibility, broadly defined as attitudes and actions that influence their ability to navigate the digital world in an ethical and responsible manner, remains critically low (Fraillon, 2024; Rohatgi et al., 2024). Adolescents need support to develop digital competence, and schools play a key role in fostering it (Choi, 2016; Mason et al., 2014, UNESCO, 2017). However, the documented gaps in many adolescents' digital competence call the adequacy of instruction into question (Eickelmann et al., 2024). Buckingham (2015) worries that efforts to develop students' competence in using and learning from digital media are often reduced to functional approaches that emphasise technical know-how, without properly preparing students to critically evaluate and use digital information. While curricular content impacts how schools approach the development of digital competence, teachers shape this development, directly through digital technology instruction and indirectly when using technology in other activities (Kure et al., 2025). To better understand opportunities to develop digital responsibility within formal education, this study examines how digital responsibility is addressed in Norwegian lower secondary schools' English classrooms through video observations and teacher interviews.

Norway has long been a front-runner in equipping schools with digital technology, resulting in a 1:1 student-to-laptop ratio (Norwegian Directorate for Education and Training [NDET], 2022). This makes Norway an interesting case for examining digital practices in schools, as technological use can be studied without considering resource constraints. In 2006, Norway was one of the first countries to define digital skills as a basic competence across subjects through the Knowledge Promotion Curricular Reform (LK06) (Gudmundsdottir, Brevik et al., 2024). However, reform evaluations revealed significant local variations in how the LK06 digital initiative was approached and found considerable differences in digital competence both among students and teachers (Egeberg et al., 2016; Hatlevik & Christophersen, 2013; Aasen et al., 2012). The revised national Framework for Basic Skills (NDET, 2017b) and the Knowledge Promotion 2020 Reform (LK20) stipulated that students should develop digital competence through engagement with subject matter and specified that students are to exercise digital responsibility in every subject. These prescriptions have implications for teaching and learning practices as digital responsibility should be part of classroom instruction in all subjects and grades (Engen, 2020; Gudmundsdottir et al., 2020).

Despite explicit curricular intentions and a highly digitalised school environment, digital responsibility remains a neglected dimension of digital competence in Norwegian schools (Blikstad-Balas & Klette, 2020; Gudmundsdottir, Brevik et al., 2024; Kure et al., 2025). To date, little is known about digital responsibility practices and teachers' views on them. Arguably, these practices are urgent to investigate given rapid

developments in the digital society—particularly the widespread adoption of artificial intelligence (AI) resources, including large language models (LLMs). Since studies have already documented that LLMs are heavily present in classrooms, often without norms to guide practice (Elstad & Eriksen, 2024; Furberg et al., 2024), the issue of digital responsibility in education will likely remain critical for years to come.

To better understand the characteristics of current practices, our study investigates how students and teachers engage with digital responsibility in English classes for Grades 8 and 10 (ages 13–15) after the implementation of the LK20 reform, providing valuable insights into the impact of this new curriculum on classroom practices. We examined digital responsibility practices using video-recorded lessons and teacher interviews, following the same student cohorts over the longest possible timespan within lower secondary education in Norway. English's status as the dominant language online makes this subject particularly pertinent to investigations of how digital responsibility is addressed in schools. Because our study captures early-stage practices under the LK20 curricular reform, it can serve as a baseline for future comparative studies of developments in digital responsibility practices.

Aims and research questions

This study adds to existing knowledge on digital competence practices in schools by illuminating how digital responsibility is addressed in English lessons in Norwegian lower secondary schools. We pose the following research questions (RQs):

RQ1: How prevalent are digital responsibility practices in English lessons in highly digitalised classes in Grades 8 and 10 in relation to other dimensions of digital competence?

RQ2: What characterises the observed classroom practices relating to digital responsibility in Grades 8 and 10?

RQ3: How do interviewed teachers describe their digital responsibility instruction?

Digital responsibility

Digital responsibility, sometimes called digital judgement, is a key dimension of digital competence reflected in various frameworks, including the European Union's Digital Competence Framework for Citizens (Vuorikari et al., 2022) and the Norwegian Framework for Basic Skills (NDET, 2017b). In these frameworks, digital responsibility encompasses the management of digital identities, the application of copyright and licences, data protection and netiquette. In this study, we draw on Gudmundsdottir, Holmarsdottir et al.'s (2024) conceptualisation of students' digital responsibility, which comprises three interrelated aspects: legal, ethical and attitudinal (Table 1). Although digital responsibility can be explored differently – for example, by categorising according to knowledge, skills and attitudes (Vuorikari et al., 2022) – our framework enabled us to obtain a nuanced understanding of the focus of digital responsibility

practices, which facilitated our characterisation of classroom practices.

Table 1. Conceptualising digital responsibility

Digital responsibility	Legal aspects	Copyright and plagiarism Privacy and data protection
	Ethical aspects	Responsibility for self and others Moral agency Sense of trust, friendship, goodwill
	Attitudinal aspects	Online behaviour and identities Online bullying Critical source awareness

Note. From Gudmundsdottir, Holmarsdottir et al. (2024, p. 381).

The legal aspects of digital responsibility concern the rules that govern lawful conduct in the digital realm, including knowledge of when rules apply, how to apply them and potential consequences of violations. These rules cover issues of copyright, plagiarism, privacy and data protection. The ethical aspects involve the ability to respect norms, uphold values and navigate moral issues; thus, they involve the competence to reflect on and act in ways that respect ethical standards in the digitalised world. Attitudinal aspects include learners' online behaviour and attitudes, identity expression and critical source awareness. Together, these aspects show that digital responsibility exceeds mastering technological skills (cf. Martzoukou et al., 2020; NDET, 2017b). It is a form of computer ethics (Lee & Chan, 2008) describing an individual's ability to engage ethically and respectfully online, adapting existing societal standards to the digital context.

Thus defined, digital responsibility encompasses not only the ability to follow rules but also attitudes, identity, and critical thinking (Gudmundsdottir, Holmarsdottir et al., 2024), all of which requires practice and experience to develop (Engen et al., 2021). Knowledge and skills are simply not enough; students also need opportunities to reflect on and exercise digital responsibility in a safe environment.

Previous research

While research on digital responsibility instruction is not extensive (Giæver et al., 2021), several studies have identified a need to support young people in becoming digitally responsible citizens (Gudmundsdottir, Holmarsdottir et al., 2024; Burns & Gottschalk, 2019; Kure et al., 2023). In 2013, the ICILS highlighted the importance of schools raising students' awareness of safe and responsible digital technology use, including source criticism, copyright and privacy (Ottestad et al., 2014). A decade later, the ICILS reaffirmed the need to strengthen students' digital responsibility (Rohatgi et al., 2024). Additionally, advancements in AI accessibility have intensified concerns about insufficient attention to digital responsibility in school

(Gudmundsdottir, Brevik et al., 2024).

Discussing international research on approaches to digital responsibility in schools, Giæver et al. (2021) indicate that teachers typically prioritise certain aspects of digital responsibility (e.g. digital bullying and plagiarism) while neglecting others. In Norway, teachers emphasise source criticism, digital bullying and netiquette but display limited competence in the legal aspects of digital responsibility (Giæver et al., 2021). Furthermore, Norwegian studies of naturally occurring instruction suggest that digital responsibility is sidelined compared to other dimensions of digital competence. For example, two studies of lower secondary English teaching before and after LK20's introduction showed an almost complete absence of digital responsibility practices, despite opportunities for students to develop other dimensions of digital competence (Kure et al., 2023; Kure et al., 2025). The authors describe this absence as concerning, as the students often engaged in activities that required digital responsibility, such as online searches. Similarly, in an assessment of the implementation of LK20, digital responsibility was the least frequently observed dimension of digital competence across multiple subjects despite widespread technology use in all classrooms (Gudmundsdottir, Brevik et al., 2024).

This apparent lack of systematic instruction in digital responsibility may result in disproportionate attention to some aspects, potentially explaining why Norwegian students have reported greater knowledge of critical source awareness compared to other aspects of digital responsibility (Gudmundsdottir, Holmarsdottir et al., 2024). In the same study, the students also reported limited knowledge of privacy and copyright and admitted to frequently ignoring applicable rules or recommendations. Additionally, they claimed that although their teachers talked about the importance of some aspects of digital responsibility, they were generally not taught how to develop the necessary competence to behave accordingly. In this environment, peer norms would often shape online behaviours (Gudmundsdottir, Holmarsdottir et al., 2024).

In sum, existing research suggests that teachers give limited and inconsistent attention to students' digital responsibility. Furthermore, while the reviewed studies show traces of instruction that targets digital responsibility, we know little about the characteristics of digital responsibility practices in classrooms. This study aims to help bridge this gap.

Method

Our study is part of the large-scale longitudinal research project EDUCATE, which evaluated the implementation of the LK20 curricular reform in several subjects of Norwegian primary and secondary schools (Brevik et al., 2023). This study used data from the project to examine the characteristics of digital responsibility practices in lower secondary English classrooms. We employed a mixed methods design,

analysing video-recorded lessons and teacher interviews, integrating findings and drawing inferences about classroom practices using qualitative and quantitative methods (Mertens, 2023). Our comparative approach draws on conceptualisations of comparative case studies that emphasise the tracing of a phenomenon of interest across sites or scales, over contrasting targeted features across cases (Bartlett & Vavrus, 2017). Utilising this tracing comparative logic, we examined digital responsibility practices transversally over time, following selected student cohorts in Grades 8 and 10. To our knowledge, this study is the first to use longitudinal, multi-site video data to systematically trace opportunities for lower secondary school students to develop digital responsibility during English lessons and to combine those with interview data to better understand classroom practices.

Sampling

Our study sampled all lower secondary lesson and interview data for English collected by EDUCATE project members (Table 2).

Table 2. Data overview

	School year	Schools	Classes	Teachers	Video-recorded lessons	Teachers interviewed
Grade 8	2021-22	4	9	6	36	5
Grade 10	2023-24	4	8	5	27	4
Total		4	9*	9**	63	9

*Note: *We followed the same classes from Grade 8 to 10, however, one withdrew in Grade 10. **Two teachers were followed across school years.*

In 2021–2024, EDUCATE video recorded 63 naturally occurring English lessons from the same nine student cohorts in Grades 8 (36 lessons) and 10 (27 lessons), without researcher intervention or intentional manipulation of variables. Schools from four school districts in Norway were strategically sampled to reflect geographic, demographic, and language diversity, as well as variations in student achievement on national tests (Brevik et al., 2023). Using a longitudinal case methodology, the project revisited the same schools and student cohorts, gathering comparable video and interview data at each data collection point. Nine teachers with differing backgrounds taught the video-recorded lessons (Table 3), seven of whom agreed to be interviewed. EDUCATE's longitudinal case methodology allowed us to examine classroom practices involving the same student cohorts at the beginning and end of lower secondary education. Using video and interview data from both data collection points allowed us to trace any progression between Grades 8

and 10—for example, if teachers purposefully broadened or deepened students’ understanding of digital responsibility. To illuminate these dimensions, the integration of video-recorded lesson observations with teachers’ self-reported priorities, reasoning and reflections was crucial.

Table 3. Teacher demographics

Age				Qualification in English (ECTS)			Years of teaching experience		
20-29	30-39	40-49	50-59	MA (90)	31-60	None	0-5	6-10	11-20
1	3	2	1	4	2	1	4	2	1

Note: ECTS=European credit transfer system. No data available for the two teachers who were not interviewed

Video-recorded English lessons

Three to four consecutive English lessons from each classroom were video recorded. Participating teachers were requested to follow their teaching plans independently of the topics covered, the teaching methods used or inclusion of digital technology, including the thematisation of digital responsibility. To obtain high-quality video data on whole-class teaching and teacher–student interactions, EDUCATE used two small cameras and at least two microphones—one wireless on the teacher and one for student voices—that simultaneously recorded each lesson from the front and back of the classroom. The same video design was used across all observed lessons (Brevik et al., 2023). All schools, teachers and students were pseudonymised.

Teacher interviews

Individual in-depth interviews were held with each of the seven consenting teachers within three weeks of completing the classroom observations. Teachers Monica (S02) and Sebastian (S17) taught the same student cohorts in Grades 8 and 10 and were thus interviewed twice, in 2021–22 and 2023–24; the remaining teachers, Andrea (S50), Iben (S13), Iselin (S50), Karoline (S13) and Selma (S13), were each interviewed once. The interviews included prompts on the teaching observed to ensure that teachers could recall and comment on observed digital responsibility practices. The interviews, which were held in Norwegian, were audio recorded, pseudonymised and transcribed verbatim. Transcript extracts included in the findings were translated into English by the authors.

Analytical procedures

Our study integrated the quantitative and qualitative analysis of video data to expound observed digital

responsibility practices and further integrated the qualitative analysis of interview data to corroborate and explain observed practices following the steps described below.

First, to answer RQ1, regarding the prevalence of digital responsibility in English lessons compared to other dimensions of digital competence, we systematically analysed the 63 video-recorded lessons using the validated EDUCATE observation protocol (version 1.1) for digital competence (Gudmundsdottir, Brevik et al., 2024) as our analytical framework. This protocol was specifically developed to capture instructional features that align with national stipulations about digital competence in the LK20 core curriculum and subject curricula (Ministry of Education and Research [MER], 2019b; NDET, 2017a) and the Norwegian Framework for Basic Skills (NDET, 2017b) while being informed by relevant international research (Gudmundsdottir, Brevik et al., 2024). The protocol includes a teacher category that focuses on instructional practices and four student categories representing digital sub-competencies in *search and navigation*, *production*, *communication*, and *digital responsibility*. It operationalises the use of these digital competencies through four levels, ranging from no observation (Score 1) to advanced use (Score 4). The protocol enabled us to identify instructional practices that gave students opportunities to engage their digital competencies and to differentiate between simple (Score 2), varied (Score 3) or advanced (Score 4) use.

Figure 1. Observation protocol used to identify digital competence practices in the classroom

		1 No observation of digital competence	2 Simple use of digital competence	3 Varied use of digital competence	4 Advanced use of digital competence
Teachers	Instruction	Teacher does <i>not</i> use and does not provide opportunities to use digital technology to gather information, for production, communication or to conduct digital responsibility.	Teacher models simple use or provides opportunities for students' <i>simple</i> use of digital technology for search and navigation, production or communication. Or: instruction about rules or procedures in how to conduct digital responsibility.	Teacher models varied use or provides opportunities for students' <i>varied</i> use of digital technology for search and navigation, production or communication. Or: instruction about legal, ethical or social considerations by use of digital technology or resources.	Teacher models advanced use or provides opportunities for students' <i>advanced</i> use of digital technology for search and navigation, production or communication. Or: Teacher provides opportunities for students to make legal, ethical or social considerations by using digital technology or resources.
Students	Search and navigation	Students do <i>not</i> navigate or search for information by using digital technology.	One or more students conduct <i>simple</i> use of digital technology for search or navigation to find, store, use or retrieve information.	One or more students conduct <i>varied</i> use of digital technology for search or navigation to find, store, use or retrieve information.	One or more students conduct <i>advanced</i> use of digital technology for search or navigation to find, store, use or retrieve information.
	Production	Students do <i>not</i> use digital technology to create products.	One or more students demonstrate <i>simple</i> use of digital technology to create products.	One or more students demonstrate <i>varied</i> use of digital technology to create products.	One or more students demonstrate <i>advanced</i> use of digital technology to create digital products.
	Communication	Students do <i>not</i> use digital technology in communication or interaction.	One or more students show simple use of digital technology in communication or interaction.	One or more students show varied use of digital technology for interaction processes.	One or more students show <i>advanced</i> use of digital technology for interaction processes and communication.
	Digital responsibility	It is not possible to identify whether students talk about or follow privacy rules, use of sources or the protection of digital technology.	One or more students talk about or follow simple privacy rules, use of sources or the protection of digital technology. Or they talk about or show simple digital use of sources or follow copyright rules.	One or more students talk about or behave ethically and responsibly online, or they apply varied strategies to protect digital technology. Or they talk about or choose varied digital sources or manage copyright rules.	One or more students reflect on or behave ethically and responsibly online, or they use advanced strategies to avoid unwanted events in line with rules and regulations. Or they assess digital sources critically.

Note. From Gudmundsdottir, Brevik et al. (2024). Reprinted with permission.

To enable a finer-grained analysis of the data, we divided each lesson into 15-minute segments, totalling 214 segments in Grades 8 ($n = 117$) and 10 ($n = 97$). Following previous video studies (Brevik, 2019; Cohen, 2018), we coded all lessons using the video analysis programme InterAct for synchronised viewing, coding and statistical analysis. To ensure reliable coding, we double coded 20% of the lessons in Grades 8 ($n = 7$) and 10 ($n = 6$), ensuring spread across classes. We achieved an inter-rater agreement of 82.38% and reached consensus on the remaining 17.62% after discussing disagreements. Using this procedure, we generated descriptive statistics which showed that the teachers' or students' digital competencies figured in all 214 segments, but that students' digital responsibility was rarely observed. Subsequently, we focused solely on the protocol category of *digital responsibility*.

As a second step, to investigate what characterises the observed digital responsibility practices and answer RQ2, we qualitatively analysed all segments scored 2–4 in the *digital responsibility* category ($n = 16$), i.e. those in which students engaged in or discussed digital responsibility. This analysis served the purpose of completion (Poth, 2018), meaning enhancing evidence to better understand the video data. Using Gudmundsdottir, Holmarsdottir et al.'s (2024) conceptualisation of digital responsibility, Skarpaas coded the relevant segments deductively based on a combination of lesson transcripts and video recordings. The discrete aspects of digital responsibility conceptualised in the framework were used as categories to identify the legal, ethical and attitudinal aspects that students engaged in or that the teachers' instruction addressed (e.g. copyright and plagiarism, moral agency, and source criticism awareness). The qualitative analysis also examined lesson topics, learning activities and how the identified aspects of digital responsibility were addressed. This included examining whether instruction encompassed multiple aspects of digital responsibility and whether digital responsibility practices were prompted by the teacher or the students.

Third, the video data analyses initiated the analysis of the nine teacher interviews to answer RQ3. Our qualitative analysis of these data served two purposes: a) to corroborate (or not) the typicality of the observed instructional practices and b) to help explain these practices (Poth, 2018). To create data-grounded categories that could facilitate a deeper understanding of the practices we observed, Dodou analysed the interview transcripts using qualitative content analysis (Drisko & Maschi, 2016). The data were coded abductively by combining the theory-based categories in EDUCATE's observation protocol and in Gudmundsdottir, Holmarsdottir et al.'s (2024) with inductive codes to capture the teachers' reported views and practices related to digital responsibility. Through an iterative process, Dodou generated descriptive themes identifying what aspects of digital responsibility the participants deemed important for English instruction and how they described their teaching of digital responsibility.

As indicated above, to gain a more holistic view of the studied digital responsibility practices, our data

analyses were strategically connected, with the quantitative analysis of the lesson data initiating their qualitative analysis and, subsequently, the qualitative examination of teacher interviews. Our analytical procedure included identifying consistencies and contradictions across the video and interview data. Finally, we narratively integrated the three analyses conducted in our reporting of the study. Below, we present the findings from each analysis separately and integrate them into our discussion, where we draw conclusions and address implications from the combined data analyses.

Research ethics and limitations

EDUCATE received approval from the Norwegian Ethics Committee (Sikt) before data collection and followed all national guidelines for research ethics throughout the project, from obtaining consent to data storage (Brevik et al., 2023). All teachers, students and parents of students aged under 15 years provided written voluntary and informed consent (National Committee for Research Ethics in the Social Sciences and the Humanities, 2024), with the opportunity to opt out at any time without consequences. Because we observed naturally occurring instruction without specifically requesting that teachers thematise digital responsibility, a limitation of our study concerns comparability. As expected, digital responsibility was not addressed in every English lesson, which posed challenges for comparisons across grades. However, our study design combining video observations with teacher interviews provided insights into classroom practices beyond what could be gleaned from the observed lessons, which enabled us to obtain a deeper understanding of teachers' instructional repertoires and reasoning about digital responsibility.

Results

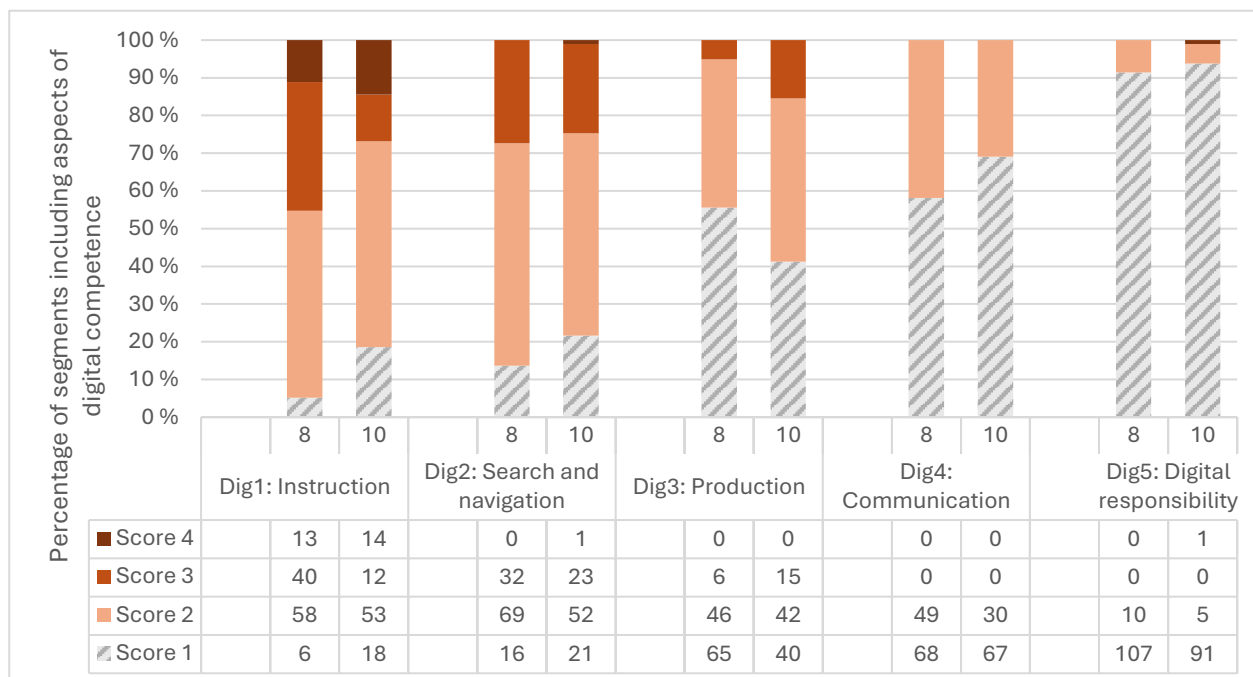
Our core findings are as follows: First, despite the abundant use of digital technology in the classes we observed, digital responsibility was seldom addressed or prompted in the lessons. Second, digital responsibility practices focused on a limited selection of the construct's aspects. Third, in the interviews teachers largely confirmed the typicality of the observed practices, reporting that they addressed digital responsibility on an *ad hoc* basis, prioritising aspects related to source criticism and management as well as the timely and appropriate use of digital technology. Most also implied that their digital responsibility instruction was not as prominent as they would like.

Digital responsibility was rarely present in the observed lessons

Using EDUCATE's observation protocol for digital competence (Gudmundsdottir, Brevik et al., 2024), we observed instances of digital competence in all 214 segments. Students' demonstration of *digital responsibility* was present in only 16 of them (Figure 2). By contrast, we observed students' *search and navigation* in 177 segments, students' *production* in 109 segments and their *communication* in 79

segments. Additionally, the teachers utilised digital competence in their instruction in 190 out of 214 segments across the two school grades.

Figure 2. Aspects of digital competence observed in English instruction per grade (2021–2024)



Note. Score 1 = no observation of digital competence; Score 2 = simple use of digital competence; Score 3 = varied use of digital competence; Score 4 = advanced use of digital competence.

Students' digital responsibility was conspicuous in its absence in both Grades 8 and 10, appearing in ten Grade 8 segments and six Grade 10 segments. Tracing its presence across segments in Grades 8 and 10, there is little evidence that digital responsibility instruction became more advanced as students matured. As Figure 3 shows, 15 of the 16 segments involved basic digital competence (Score 2), typically featuring students talking about or following simple rules for source referencing, exercising some degree of moral agency or demonstrating basic critical source awareness. Although only one segment (Score 4) showed students reflecting on the ethical and responsible use of digital resources, students may have behaved ethically online or assessed digital sources critically without this being observable in the video recordings.

In these segments, five of the nine teachers included digital responsibility instruction. This usually occurred when teachers invited students to search for information across sources or use digital resources as part of a learning activity. Table 4 indicates whether the 16 segments involved only students or both students and teachers.

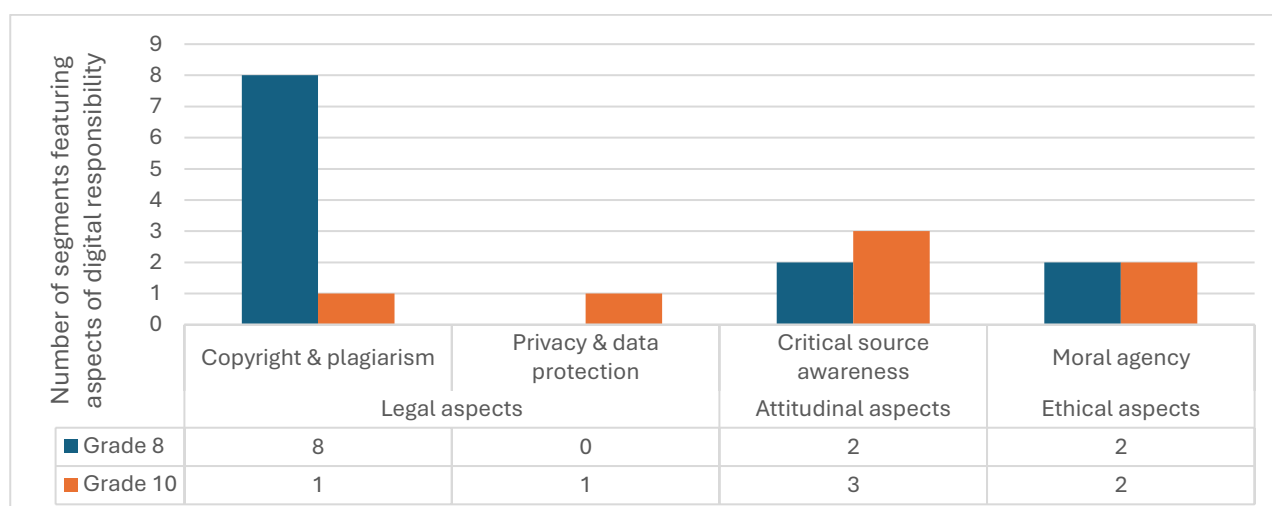
Table 4. Overview of segments that included digital responsibility by parties involved

Grade 8 (117 segments in total)		Grade 10 (97 segments in total)	
Teacher and students	Student(s) only	Teacher and student(s)	Student(s) only
9	1	4	2

In most cases, teachers and students engaged with digital responsibility in the same segments ($n = 13$). The predominant pattern involved teachers drawing attention to digital responsibility, followed by student responses. Additionally, in three instances, students engaged with digital responsibility without teacher involvement.

Classroom practices prioritized selected aspects of digital responsibility

As shown in Figure 3, the 16 digital responsibility segments primarily concerned copyright and plagiarism ($n = 9$), followed by critical source awareness ($n = 5$) and moral agency ($n = 4$). Privacy and data protection appeared in one segment. No other aspects of digital responsibility, as conceptualised by Gudmundsdottir, Holmarsdottir et al. (2024), were observed. Apart from copyright and plagiarism, which featured across several segments in one teacher's Grade 8 instruction, the other aspects were evenly distributed across the two grades.

Figure 3. Prevalence of different aspects of digital responsibility across 214 segments

Note. Some segments included more than one aspect of digital responsibility and were counted more than once.

Digital responsibility, when addressed, mainly focused on copyright and plagiarism, especially how to reference sources using digital referencing tools. Teachers' instruction in these segments ($n = 9$) emphasised the technical aspects of referencing sources over concerns about intellectual property or

plagiarism. As an exception, Monica briefly explained why her Grade 8 students should reference sources (S02, 2021–22), stressing that referencing gives due credit:

So why you need to reference? It's super easy. Referencing is just about giving credit, okay? Okay, so it's really about giving credit where credit is due. So, if you find any facts or any opinions or any ideas online or in a book or wherever and you use those facts, ideas or anything really in whatever you are writing or talking about, you need to reference. It's a bit like if I say I'm going to create a music album and then I just steal all of Beyonce's songs. And then say they're mine, that's theft. You need to credit who's done what. And it's not just facts, also ideas.

(Lesson transcript, S02, Grade 8, 2021–22 - English in the original)

The rest of her lesson focused on how students should enter references into a digital referencing system, thus inviting them to follow copyright rules (Score 2). As the related tasks involved adding arbitrary sources to an empty document, the students were not required to consider when referencing is necessary, and the focus remained on technical know-how.

Critical source awareness ($n = 5$) was typically found in lessons where students engaged in independent information gathering. For example, Iben addressed source criticism in a lesson where her students were to find online information about various English-speaking regions (S13, 2021–22). As the following episode illustrates, Iben provided advice on how to verify information in response to individual student queries:

Student: I have Southern USA, but is Florida part of southern USA or is that deep South? [showing the teacher her computer screen with a Wikipedia entry open]

Iben: Ah, well, it says according to Wikipedia Florida is ... um ... you can also, if you are unsure, you can compare so that you have multiple resources telling you. So, if you're unsure of a fact that's like a way to use critical thinking and good internet ...um... skills. So do another search for southern states USA and find another source. And then maybe even do one more to see if they agree. And then land on what you think is right.

(Lesson transcript, grade 8, S13, 2021–22 - English in the original)

Observed instances of critical source awareness were generally characterized by impromptu instruction and students demonstrating simple digital responsibility (Score 2), as in the case above. Additionally, when students were encouraged to search for online information, teachers rarely provided whole-class instruction on how to find qualitative, credible and relevant sources. Instead, they offered tailored advice to individuals or small groups that asked for help.

The segments concerning moral agency ($n = 4$) typically addressed the boundaries between cheating and ethical practices when using digital resources. For example, Monica addressed the moral agency of her students when explaining that sources should be referenced to avoid 'stealing' ideas. In the solitary segment in which students' digital responsibility practices were scored at an advanced level (Score 4), a small group of Grade 10 students talked about the ethical use of AI for preparing 'mini talks'. The following extract illustrates how the students discussed this question after the teacher, Selma, had confronted them about using AI to prepare notes:

Student 1: Why should we lie? She realized that it wasn't our work.

Student 2: The important thing is that we didn't plan to bring it [to the mini talk] or anything...

Student 1: And it's not like it was to be handed in.

Student 2: It's for learning, right? [...]

Student 1: ChatGPT is a tool, it's not for cheating.

(Lesson transcript, grade 10, S13, 2023–24. Our translation)

Here, the students acknowledged that while AI can help generate input and ideas, it would be cheating to present it as one's own work. We observed a similar reasoning from the teacher Andrea as she made a distinction between using AI to understand and to cheat: 'See, I don't want you to use ChatGPT to cheat. I want you to use ChatGPT to understand, right? And to be able to use it to draw parallels. Because it is a tool' (S50, 2023–24).

Finally, it can be noted that students repeatedly used digital resources that involved the sharing of personal data. In some segments, they needed to use the centralised identity management solution for the educational sector of Norway, FEIDE, for secure login (e.g. to use learning platforms and resources), but this action was rarely addressed in terms of privacy or data protection. Instead, it became a practical procedure for accessing resources behind a paywall. In only one instance did we observe a mention of data protection, when Monica presented her Grade 10 students with a video editing tool that she recommended using in a task. Although she did not discuss FEIDE login in terms of acting responsibly online, Monica noted the importance of guarding students' personal data on digital platforms and resources – "we don't want you to give away all your contact information and personal data to all sorts of things" (S02, 2023–24) – and she implied that privacy and data protection were recommended for schoolwork.

Teacher interviews largely confirmed the typicality of the observed practices

In the interviews, the teachers corroborated that several of the digital responsibility practices we observed were typical of their teaching. First, most teachers remarked that they addressed digital responsibility on an *ad hoc* basis. By contrast, other dimensions of digital competence were described as organically incorporated into their daily English teaching. Several clarified that instruction on digital responsibility occurred 'periodically' (Sebastian, 2023–24) and 'depend[ing] on what we are working with' (Iselin, 2021–22), sometimes indicating that it occurred in conjunction with selected topics. Iben (2021–22), Monica (2023–24) and Sebastian (2021–22), for example, linked source criticism to lessons on Indigenous peoples in which students searched for information online. Monica remarked that she rarely planned instruction on digital responsibility – 'It is not something I give much thought. Either in planning or when teaching' (2023–24) – instead addressing it as the need arose. This statement may help to explain why we saw little progression in how digital responsibility was treated across Grades 8 and 10. As an exception, Sebastian indicated that his teaching involved the progressive development of competences, noting that students had practiced source awareness and referencing 'slowly but surely since Grade 8, so when they are going to

deliver something [in Grade 10], they are good at referencing sources along the way and using credible sources' (2023–24).

Further, the teachers confirmed our observations that attitudinal aspects were a priority in their teaching by naming students' abilities to find and assess sources as central to digital responsibility instruction in English teaching. Most teachers stressed the importance of fostering students' ability to find 'good sources', remarking that many students fail to assess information, even when it is 'almost a bit obvious that it should probably be double checked' (Karoline, 2021–22) and that 'they just click on the first two-three articles' that come up in their searches without critically evaluating them (Selma, 2023–24). Andrea (2023–24) emphasised the importance of addressing the students' use of social media as information providers, commenting that 'we [teachers] talk about source criticism when it comes to Google; we talk about choosing the right articles. We don't think about the fact that what they use as search engine number one, also for education, is TikTok and Instagram'. Iben (2021–22) noted that students can become 'very overwhelmed' by the sheer volume of information that is available online, underscoring the need for students to learn how to find reliable and accessible sources and how to assess informational relevance. A related sub-competence addressed by a couple of teachers was source management, particularly students' ability to correctly reference sources, follow intellectual property regulations and avoid plagiarism.

In the interviews, the teachers' stated priorities included students' timely and appropriate use of technology as a crucial aspect of digital responsibility in English instruction. They described appropriate use as being able to select the most suitable digital resource for a task at hand (Monica, 2023–24) and to use digital resources 'as strategically as possible' (Iben, 2021–22). In Grade 8, it was tied to the ability to self-regulate and focus in technology-rich environments. Iselin observed that a major challenge for some students was refraining from chatting or gaming during English lessons: 'That is the downside of everyone having a PC [...] They struggle with focusing over a longer period on the same thing' (2021–22). Two years later, as LLMs were becoming mainstream, focus issues were no longer mentioned. In Grade 10, the teachers instead addressed students' use of AI resources, including the importance of helping students understand how ChatGPT can be used ethically and responsibly for learning.

Finally, the teachers expanded on their practices by implying that several factors hindered the prominence of digital responsibility in their teaching. Iben, for example, explained that she preferred individualised student feedback over whole-class instruction. Yet, she wondered whether this approach made her digital responsibility instruction less noticeable than she intended and if perhaps she needed to 'work in a more structured, . . . planned and conscious manner, and not just in the moments when it comes up' (2021–22). Selma, who was new at her school, assumed her Grade 10 students had already been taught how to find appropriate digital sources: 'I don't think I talk so much about [digital responsibility]. I just take for granted

that in Grade 10 you have gained an idea of what [it means] . . . to be critical and use sources and so on' (2023–24).

Furthermore, most teachers seemed to consider the ethical aspects of digital responsibility as a task primarily for other subjects. Four said that they addressed these topics themselves in social studies. One teacher clarified that she did not address questions related to online identity and safety as teaching topics in English lessons: 'If we take comments on TikTok videos and Snap[chat] and that kind of thing, it is not part of the stuff we teach' (Monica, 2021–22). Others indicated that personal interests and dispositions influenced how they addressed aspects of digital responsibility in teaching. For example, Sebastian implied that he struggled to address online identity and safety related to social media, as he had 'little experience with the newest and most popular apps' (2023–24).

Notably, teachers' tendency to de-prioritise digital responsibility in English contrasts with their reported active role in developing other dimensions of digital competence. For example, all teachers said that they addressed basic digital competencies with which many students struggled, such as organising documents in retrievable folders, both in Grades 8 and 10.

Discussion

Based on an analysis of 63 video-recorded English lessons and 9 teacher interviews, this study illuminates digital responsibility practices in highly digitalised English classrooms at Norwegian lower secondary schools. Specifically, we determined the frequency of such practices in English classes (RQ1), what characterises these practices (RQ2) and how teachers describe their digital responsibility instruction (RQ3). Our comparative study found that students visibly engaged with digital responsibility in only 7% of the 214 observed lesson segments, with minimal variation across school grades. The limited presence of digital responsibility compared with other dimensions of digital competence aligns with findings from previous observational studies of naturally occurring English teaching in Norwegian lower secondary schools (Kure et al., 2025; Kure et al., 2023). This implies that the LK20 curricular reform has yet to boost the occurrence of digital responsibility in English teaching. The teacher interviews partly confirmed this, as some teachers reported not planning for digital responsibility instruction, sometimes assuming that the students received such instruction elsewhere. At the same time, the interview data complicate this finding by indicating that several teachers connected digital responsibility to selected teaching topics, suggesting that digital responsibility instruction may be concentrated at designated times during the school year. For future research on naturally occurring teaching, the findings indicate that digital responsibility instruction may go unnoticed unless the researchers specifically request to observe it, highlighting the value of combining classroom observations with teacher self-reports.

A key finding from examining practices over time was that teachers seldom encouraged students to reflect on digital responsibility, despite frequent use of digital resources in learning activities and the high prevalence of tasks requiring students to search for information online. Teacher accounts of periodic work with digital responsibility only partially explain this finding. Although opportunities arose across the 214 observed segments, the teaching mainly emphasised functional digital skills and technical know-how over the attitudinal, ethical and legal aspects of digital responsibility (cf. Buckingham, 2015). The teachers seldom scaffolded the online searches they prompted or activated digital responsibility strategies for the whole class before students began working independently. Instead, support typically came in response to individual student requests and was offered on an impromptu and one-to-one basis. Moreover, when teachers introduced aspects of digital responsibility, the accompanying learning activities were rarely integrated with ongoing schoolwork. While our findings indicate that teachers chose to emphasise other learning points over digital responsibility, they also suggest a need for professional development to help teachers recognise opportunities to incorporate digital responsibility instruction into their lessons as well as how to do so.

In the interviews, the teachers voiced concerns about students' limited ability to locate and assess information. Although students in Grades 8 and 10 varied in abilities, the teachers reported that limited competence in critical source awareness was widespread in both school grades. Furthermore, in line with the national curriculum (MER, 2019b), teachers identified source criticism as a core component of English. These concerns and priorities were not necessarily reflected in the instruction we observed. While the teachers may have offered more targeted instruction in lessons that were not video recorded in the project, the observed reliance on student prompting raises questions about how English instruction prepares students for the digital age in line with the intentions of educational policy (see Blikstad-Balas & Klette, 2020; Engen, 2020; Gudmundsdottir et al., 2020) and the national curriculum for English. Instruction driven by student queries tends to benefit those who already grasp the significance of practices such as finding reliable sources relevant to a task. Students who do not seek help may miss opportunities to develop critical source awareness. Our findings thus underscore the importance of balancing one-to-one instruction that can offer timely guidance on specific individual challenges with targeted whole-class instruction to develop the digital responsibility of all students present.

A second main finding was that although digital responsibility involves a complex set of competencies (see Gudmundsdottir, Holmarsdottir et al., 2024), this complexity was not reflected in observed classroom practices or teacher interviews. This finding aligns with studies that show teachers' tendencies to focus on certain aspects of digital responsibility while neglecting others (Giæver et al., 2021). The teachers' emphasis on certain aspects of digital responsibility may reflect the specifications of the national curriculum for English. The English subject curriculum emphasises students' abilities 'to use sources in a critical and

accountable manner’ (MER, 2019b, pp. 8–9). Thus, unsurprisingly, the teachers in our study recognised critical source awareness, copyright and plagiarism, and moral agency as particularly relevant for English teaching and reported prioritising them over, for example, online safety and how to treat others online. Most teachers reported addressing the latter aspects in other school subjects, particularly social science, which in Norway is tasked with developing students’ digital citizenship, including the ability to ‘follow the rules and norms for online communication, privacy protection and copyright’ (MER, 2019a, p. 6). The teachers’ subject-based associations suggest that the stipulations of the national curriculum shape how teachers understand their role when it comes to fostering students’ digital responsibility in English lessons. Simultaneously, a recent report on digital competence practices in Norwegian Grade 10 classrooms across seven school subjects indicated a relatively one-sided focus on critical source awareness across subjects (Gudmundsdottir, Brevik et al., 2024). It also showed that many teachers, irrespective of the subject taught, expressed a vague understanding of the multifaceted nature of digital responsibility, mainly associating it with source criticism (Gudmundsdottir, Brevik et al., 2024). In light of this, our findings suggest the importance of supporting English teachers in gaining a more nuanced understanding of digital responsibility instruction and recognising how that instruction might align with the curricular goals for English. This is particularly important given that increases in LLM use – observed in classroom recordings and noted in the last round of interviews – entail a need for more attention to the ethical aspects of digital responsibility (cf. Elstad & Eriksen, 2024; Gudmundsdottir et al., 2024).

An important finding relating to the transversal comparisons of our study is that teachers’ sporadic and *ad hoc* instruction on digital responsibility did not necessarily prioritise progression across grades. There was little evidence of teachers’ planning increased emphasis on digital responsibility for older students, and little evidence that Grade 10 students had more opportunities to reflect on legal, ethical or other considerations when using digital technology than Grade 8 students. Although such instruction may have occurred elsewhere, most teachers indicated that they did not prioritise progression. Instead, their interview responses suggested that their digital responsibility instruction was shaped by factors such as the teachers’ own interests and dispositions regarding digital technology inside and outside the English classroom as well as their understanding of the English teacher’s role in students’ developing digital responsibility. They also implied that students’ lack of functional digital competence (storing and retrieving documents, creating folders, etc.) took priority in English lessons. Their reports echo previous studies stressing the need for digital competence instruction – even among students with high levels of digital exposure (Fraillon, 2024; Marshall, 2018). Notably, the teachers reported that many students still struggled with the efficient use of basic software in Grade 10 despite teacher efforts to address functional digital competence from Grade 8 onwards. The persisting lack of basic digital competence among these student cohorts may have been a contributing factor for the teachers’ de-prioritising the development of the

students' digital responsibility, which is generally considered a more complex dimension of digital competence that builds on a foundation of technical know-how (Engen et al., 2021). That the observed teaching allowed the practical dimensions of using digital technology to take precedence over digital responsibility seems to support this view.

The factors that contribute to maintaining these student cohorts' limited functional digital competence remain unclear. Yet, their persistence raises questions about the efficacy of digital competence instruction as a shared responsibility across school subjects. Given that Norwegian secondary teachers across subjects spend considerable lesson time on functional digital competence (Gudmundsdottir, Brevik et al., 2024), policymakers and school leaders should explore whether those dimensions of digital competence can be taught outside the subjects to make more room for digital responsibility instruction.

Conclusion

This study's main contribution is its systematic examination of digital responsibility practices in lower secondary English classrooms. Combining the analysis of video-recorded lessons and teacher interviews, the study contributes valuable knowledge about the prevalence and characteristics of such practices across classes and grades in highly digitalised lower secondary schools in Norway following the implementation of the LK20 reform. The study presents compelling evidence of the marginalised position of digital responsibility instruction compared to other dimensions of digital competence. It also indicates a need for professional development initiatives that can help English teachers balance the instruction on functional digital skills with the complex and demanding task of fostering students' responsible digital practices. As the digital landscape increases in complexity – including the growing presence of LLMs in education – there is an urgent need to ensure that students are equipped with the ethical, legal and attitudinal competence required to navigate digital environments responsibly. Future research should explore how digital responsibility can be more systematically integrated into subject teaching and how teachers and students can become more aware of the responsibility practices needed when engaging with digital technologies in class.

Acknowledgements

We wish to thank the schools, teachers and students that participated in the study. We would also like to thank all members of the EDUCATE research team for invaluable contributions throughout the research process.

Author contributions

Kaja Granum Skarpaas: Conceptualization, Formal analysis, Project administration, Validation, Visualization Writing – original draft, Writing – review & editing. **Katherina Dodou:** Conceptualization, Formal analysis, Methodology, Validation, Writing – original draft, Writing – review & editing.

References

- Bartlett, L., & Vavrus, F. (2017). Comparative case studies: An innovative approach. *Nordic Journal of Comparative and International Education (NJCIE)*, 1(1). <https://doi.org/10.7577/njcie.1929>
- Blikstad-Balas, M., & Klette, K. (2020). Still a long way to go. *Nordic Journal of Digital Literacy*, 15(1), 55–68. <https://doi.org/10.18261/issn.1891-943x-2020-01-05>
- Brevik, L. M. (2019). Explicit reading strategy instruction or daily use of strategies? Studying the teaching of reading comprehension through naturalistic classroom observation in English L2. *Reading and Writing*, 32(9), 2281–2310. <https://doi.org/10.1007/s11145-019-09951-w>
- Brevik, L. M., Gudmundsdottir, G. B., Doetjes, G., & Barreng, R. L. S. (2023). *Å observere fagfornyelsen i klasserommet. Observasjonsprotokoller for livsmestring, utforskning og digital kompetanse* [Observing the Subject Renewal in the Classroom. Observation Protocols for Life Skills, Inquiry and Digital Competence]. Rapport 1 fra forsknings- og evalueringsprosjektet EDUCATE ved Institutt for lærerutdanning og skoleforskning. Universitetet i Oslo.
- Buckingham, D. (2015). Defining digital literacy – What do young people need to know about digital media? *Nordic Journal of Digital Literacy*, 10, 21–35. <https://doi.org/10.18261/ISSN1891-943X-2015-Jubileumsnummer-03>
- Burns, T., & Gottschalk, F. (2019). *Educating 21st century children: Emotional well-being in the digital age*. OECD Publishing. <https://doi.org/10.1787/b7f33425-en>
- Choi, M. (2016). A concept analysis of digital citizenship for democratic citizenship education in the internet age. *Theory & Research in Social Education*, 44(4), 565–607. <https://doi.org/10.1080/00933104.2016.1210549>
- Cohen, J. (2018). Practices that cross disciplines? Revisiting explicit instruction in elementary mathematics and English language arts. *Teaching and Teacher Education*, 69, 324–335. <https://doi.org/10.1016/j.tate.2017.10.021>
- Drisko, J., & Maschi, T. (2016). *Content analysis*. Oxford University Press.
- Egeberg, G., Hultin, H., & Berge, O. (2016). *Monitor 2016. Skolens digitale tilstand [Monitor 2016. Schools' digital state]*. Senter for IKT i utdanningen.
- Eickelmann, B., Barbovschi, M., Holmarsdottir, H., Parsanoglou, D., Sisask, M., & Labusch, A. (2024). Perspectives of children and young people on their education as preparation for their future in the digital age: In-depth qualitative study in five European countries. In H. Holmarsdottir, I. Seland, C. Hyggen, & M. Roth (Eds.), *Understanding the everyday digital lives of children and young people* (pp. 321–350). Springer International Publishing. https://doi.org/10.1007/978-3-031-46929-9_11
- Elstad, E., & Eriksen, H. (2024). High school teachers' adoption of generative AI: Antecedents of instructional AI utility in the early stages of school-specific chatbot implementation. *Nordic Journal of Comparative and International Education*, 8(1). <https://doi.org/10.7577/njcie.5736>
- Engen, B. (2020). Innledning: Om forholdet mellom utdanning, digitalisering og sosial forandring [Introduction: On the relationship between education, digitalization, and social change]. In B. Engen (Ed.), *Digitalisering, kompetanse og læring* (pp. 11–26). Gyldendal.
- Engen, B., Giæver, T., & Mifsud, L. (2021). Om å utøve digital dømmekraft [On exercising digital responsibility]. In B. Engen, T. Giæver, & L. Mifsud (Eds.), *Digital dømmekraft* (pp.17–29). Gyldendal.

- Fraillon, J. (Ed.). (2024). *An international perspective on digital literacy. Results from ICILS 2023*. International Association for the Evaluation of Educational Achievement (IEA).
- Furberg, A., Silseth, K., Rødnes, K., Arnseth, H., Kvamme, O., Rasmussen, I., Sæther, E., Vasbø, K., Pettersen, K., Øistad, J., & Lund, A. (2021). *Fagfornyelsen i møte med klasseromspraksiser: Elevers læring i møte med de tverrfaglige temaene* [The curriculum renewal facing classroom practices: Students encounter the cross-curricular topics]. Rapport 7 fra prosjektet EVA2020 ved Utdanningsvitenskapelig fakultet. Universitetet i Oslo.
- Giæver, T., Mifsud, L., & Gjølstad, E. (2021). Digital dømmekraft i skolen: Lærers tilnærming [Digital responsibility in schools: The teacher's approach]. In B. K. Engen, T. Giæver, & L. Mifsud (Eds.), *Digital dømmekraft* (pp. 105–122). Gyldendal.
- Gudmundsdottir, G., Gassó, H., Rubio, J., & Hatlevik, O. (2020). Student teachers' responsible use of ICT: Examining two samples in Spain and Norway. *Computers & Education*, 152, Article 103877. <https://doi.org/10.1016/j.compedu.2020.103877>
- Gudmundsdottir, G. B., Brevik, L. M., Aashamar, P. N., Barreng, R. L. S., Dodou, K., Doetjes, G., Hartvigsen, K. M., Hatlevik, O. E., Isaksen, A. R., Magnusson, C. G., Mathé, N. E. H., Roe, A., Skarpaas, K. G., Stovner, R. B., & Suhr, M. L. (2024). *Variasjon og valgfrihet, mens vi venter på digital dømmekraft. Digital kompetanse i fagene i det heldigitale klasserommet på 10. trinn og vg3* [Variation and freedom of choice, while we are waiting for digital responsibility. Digital competence in the subjects in the digital classroom in grade 10 and 13]. Rapport 4 fra forsknings-og evalueringsprosjektet EDUCATE ved Institutt for lærerutdanning og skoleforskning. Universitetet i Oslo.
- Gudmundsdottir, G., Holmarsdottir, H., Mifsud, L., Teidla-Kunitsõn, G., Barbovski, M., & Sisask, M. (2024). Talking about digital responsibility: Children's and young people's voices. In H. Holmarsdottir, I. Seland, C. Hyggen, & M. Roth (Eds.), *Understanding the everyday digital lives of children and young people* (pp. 379–431). Springer International Publishing. https://doi.org/10.1007/978-3-031-46929-9_13
- Hatlevik, O., & Christophersen, K. (2013). Digital competence at the beginning of upper secondary school: Identifying factors explaining digital inclusion. *Computers & Education*, 63, 240–247. <https://doi.org/10.1016/j.compedu.2012.11.015>
- Kure, A., Blikstad-Balas, M., & Brevik, L. M. (2025). Digital ambitions vs. classroom reality in Norwegian lower secondary schools: What digital competencies are students developing over time? *Teaching and Teacher Education*, 153. <https://doi.org/10.1016/j.tate.2024.104843>
- Kure, A., Brevik, L. M., & Blikstad-Balas, M. (2023). Digital skills critical for education: Video analysis of students' technology use in Norwegian secondary English classrooms. *Journal of Computer Assisted Learning*, 39(1), 269–285. <https://doi.org/10.1111/jcal.12745>
- Lee, W., & Chan, A. (2008). Computer ethics: An argument for rethinking business ethics. *2nd World Business Ethics Forum, Hong Kong*.
- Marshall, S. J. (2018). Technology and modern students—The digital natives fallacy. In S. J. Marshall (Ed.), *Shaping the university of the future: Using technology to catalyse change in university learning and teaching* (pp. 197–211). Springer Singapore. https://doi.org/10.1007/978-981-10-7620-6_10
- Martzoukou, K., Fulton, C., Kostagiolas, P., & Lavranos, C. (2020). A study of higher education students' self-perceived digital competences for learning and everyday life online participation. *Journal of Documentation*, 76(6), 1413–1458. <https://doi.org/10.1108/JD-03-2020-0041>
- Mason, L., Junyent, A., & Tornatora, M. (2014). Epistemic evaluation and comprehension of web-source information on controversial science-related topics: Effects of a short-term instructional intervention. *Computers & Education*, 76, 143–157. <https://doi.org/10.1016/j.compedu.2014.03.016>
- Mertens, D. (2023). *Mixed methods research. Research methods*. Bloomsbury Publishing.

- Ministry of Education and Research. (2019a). *Læreplan i samfunnsfag (SAF01-04)* [Curriculum for Social Studies]. Established as regulations. The National curriculum for the Knowledge Promotion 2020. <https://www.udir.no/lk20/saf01-04>
- Ministry of Education and Research. (2019b). *Læreplan i engelsk (ENG01-05)* [Curriculum for English]. Established as regulations. The National curriculum for the Knowledge Promotion 2020. <https://www.udir.no/lk20/eng01-05>
- National Committee for Research Ethics in the Social Sciences and the Humanities. (2024). *Guidelines for Research Ethics in the Social Sciences and the Humanities*.
- Norwegian Directorate for Education and Training (NDET). (2017a). *Core curriculum—Values and principles for primary and secondary education*. Laid down by Royal decree. The National curriculum for the Knowledge Promotion 2020. <https://www.regjeringen.no/contentassets/53d21ea2bc3a4202b86b83cfe82da93e/core-curriculum.pdf>
- Norwegian Directorate for Education and Training (NDET). (2017b). *Rammeverk for grunnleggende ferdigheter* [Framework for basic skills]. <https://www.udir.no/laring-og-trivsel/rammeverk/rammeverk-for-grunnleggende-ferdigheter/2.1-digitale-ferdigheter/>
- Norwegian Directorate for Education and Training (NDET). (2022). *Utdanningsspeilet 2022* [The Norwegian education mirror 2022]. <https://www.udir.no/tall-og-forskning/publikasjoner/utdanningsspeilet/utdanningsspeilet-2022/>
- Ottestad, G., Throndsen, I., Hatlevik, O., & Rohatgi, A. (2014). *Digitale ferdigheter for alle? Norske resultater fra ICILS 2013* [Digital skills for all? Norwegian results from ICILS 2013]. Senter for IKT i utdanningen, Universitetet i Oslo.
- Poth, C. N. (2018). *Innovation in mixed methods research: A practical guide to integrative thinking with complexity*. Sage Publications.
- Rohatgi, A., Hatlevik, O., Gudmundsdottir, G., Erstad, O., & Björnsson, J. (2024). *ICILS 2023: Digital kompetanse og algoritmisk tenkning hos norske niendeklassinger* [ICILS 2023: Digital competence and algorithmic thinking among Norwegian ninth graders]. Cappelen Damm Akademisk. <https://doi.org/https://doi.org/10.23865/noasp.219>
- UNESCO. (2017). *Working group on education: Digital skills for life and work*. UNESCO Digital Library
- Vuorikari, R., Kluzer, S., & Punie, Y. (2022). *DigComp 2.2: The digital competence framework for citizens – With new examples of knowledge, skills and attitudes*. Publications Office of the European Union. <https://dx.doi.org/10.2760/115376>
- Aasen, P., Møller, J., Rye, E., Ottesen, E., Prøitz, T., & Hertzberg, F. (2012). *Kunnskapsløftet som styringsreform - et løft eller et løfte? Forvaltningsnivåenes og institusjonenes rolle i implementeringen av reformen* [The Knowledge Promotion Reform as a Governance Reform. The Role of Administrative Levels and Institutions in the Implementation of the Reform]. NIFU.