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## INFORMATION & COMMUNICATIONS TECHNOLOGY IN EDUCATION | RESEARCH ARTICLE

# A multiple-case study on students' sourcing activities in a group task

Eva Wennås Brante\*

**Abstract:** Students need to apply evaluation strategies to find relevant and trustworthy information when completing open-inquiry tasks on the Internet. One such strategy, sourcing, implies attention to information about the sources of documents. This multiple-case study investigates how three small groups of secondary school students solved an open-inquiry task. The task took place after extensive instruction on how to benefit from the use of source information when selecting, reading, and integrating information. The multiple-case study aimed to ascertain how the taught sourcing skills were reflected in the different groups' sourcing activities. Data consisted of observations, interviews, and documents. Results show that groups performed more sourcing activities than they displayed in their oral presentation. Though the integration of information from multiple documents was less prominent, teachers valued it highly. The findings suggest that instructions in school should not focus on the performance of sourcing activities but on discussions where students compare their selections and integration of information.

**Subjects:** ICT; Classroom Practice; Teaching & Learning; Technology in Education; Teaching

**Keywords:** multiple documents; sourcing; multiple case study; secondary school; group task; computer-based

### ABOUT THE AUTHOR

Eva Wennås Brante, Ph.D. Her research interests are in reading comprehension and critical reading. Her recent research is on promoting upper-secondary school students' critical reading and learning in the 21st century information society and on dyslexic and non-dyslexic readers' comprehension of multimodal material. This paper was written during her post-doctor period at Oslo University.

### PUBLIC INTEREST STATEMENT

To search, evaluate and then select trustworthy information online is challenging. Thus, students need strategies when they are sifting through internet searching for information. It has repeatedly been shown that without instructions in how to evaluate information, students base their decisions on either top search hits or what they already are familiar with. This paper investigates how 15 students in secondary school solved an online inquiry task. The students had received instructions into how to select and evaluate information by attending to the sources of the information. Through interviews and observations, it was found that students knew more about evaluation of sources than they displayed in their final product. Moreover, students' motivation to use source information was mostly driven by demands from the teacher. This shows that discussions around *why* a certain piece of information is selected is as important as to practice *how* to select information.

## 1. Introduction

When students go online to complete open-inquiry tasks, the challenge nowadays is not merely to find information but to sift through a wealth of online resources to find information relevant to their particular task. To make appropriate selections, students must weigh the credibility of various resources (Goldman & Scardamalia, 2013; Leu et al., 2015). Once students have selected their resources, they must synthesize information from different, and perhaps even contradictory, perspectives to arrive at a well-grounded answer. Thus, completing a task using online resources involves more than merely reading the content. Without strategies for distinguishing between and evaluating online resources, students are likely to just choose the top search hits (Hargittai, Fullerton, Menchen-Trevino, & Thomas, 2010), select information that aligns with their personal opinions on assigned topics (Maier & Richter, 2014), or assess online resources' credibility by content relevance alone, thus failing to discern the author's or publisher's intention in sharing the information (Goldman, Braasch, Wiley, Graesser, & Brodowska, 2012). Goldman, Snow, and Vaughn (2016) have argued that, although students in grades 4 to 12 may master reading basics, such as word reading and fluency, most are unable to independently acquire the proficiency needed to read in increasingly complex text environments. Reading activities such as evaluating, corroborating, and synthesizing require continuous reading instruction. Reading researchers have shown an interest in designing instructions targeting these skills, often through the use of a heuristic strategy called "sourcing" (Wineburg, 1991). Sourcing can be explained as an advanced reading strategy where the reader pays close attention to available information about the sources of documents when selecting, reading, and synthesizing information.

In a recent literature review of instructional intervention studies targeting sourcing in text comprehension, Brante and Strømsø (2018) showed that 16 of the 18 reviewed studies used pre-selected documents; only two studies permitted students to search the Internet for information. The researchers argued that the approach with pre-selected documents does not prepare students for the real demands they will meet when solving inquiry problems in school assignments. Furthermore, the reviewed studies mainly focused on the evaluation of credibility when selecting information, but it is necessary also to study the process of synthesizing retrieved information.

Consequently, the research reported in this paper aimed to investigate how upper-secondary students succeeded in performing an open-inquiry group task using the Internet. The students were participating in a more extensive study that focused on developing students' sourcing skills. The quantitative results of the larger study showed that students indeed had increased their attention to source information, remembered source information better than the control group, and justified their choices of sources to a greater extent by referring back to source features (Bråten, Brante, & Strømsø, 2019). However, the current study attempts to contribute to the field by presenting a fuller and more diverse understanding of how students actually use sourcing strategies after receiving instructions in sourcing skills, a perspective less addressed in previous studies. Thus, by providing teachers with concrete examples of students' reasoning when searching, evaluating, and synthesizing information, this research aims to better equip teachers in designing teaching activities targeting sourcing skills.

## 2. Theoretical framework

Sourcing—a key concept in this study—emerged from the field of history (Wineburg, 1991). It has been described as a helpful strategy when reading from multiple documents, and it involves separating the source of the document from its content and pursuing detailed information about the source itself. Sourcing occurs when readers pay close attention to features about a document's source (e.g., the author, the year of publication, and the publisher) and consider this information when selecting their online resources. Sourcing may also involve considering source features (e.g., what it means if a commercial site publishes a resource) while reading. Reading online involves sourcing demands beyond those required for reading print. On the Internet, source features like publisher information may be harder to discern. The hypertext system created by the Internet adds an extra dimension to the practice of sourcing (Cho &

Afflerbach, 2017). Even if a reader evaluates the source features of one website, there is no guarantee that this process will be repeated with every click on a new hyperlink. Thus, when reading hypertexts, one must engage in useful responsive strategies to interrelate multiple digital resources.

### **2.1. Reading from multiple documents**

Reading from more than one document requires both sorting and organizing information and content. Source features are central when reading from more than one document. Britt, Perfetti, Sandak, and Rouet (1999) and Perfetti, Rouet, and Britt (1999) described this practice using the documents model framework (DMF), which posits that reading from multiple documents (as opposed to reading from a single document) requires the construction of an additional text-representing layer: an intertext model. This means that the reader must tag content to source features. For example, a unit about the dangers of social media may be written by a professor, but a journalist may write another unit about its advantages. By recording this information, the reader constructs a mental representation of which document each information unit belongs to and how these information units are interrelated.

## **3. Literature review**

### **3.1. Students sourcing skills**

Identifying quality issues in a set of multiple documents is a challenging task for adolescents. In a recent study by Macedo-Rouet et al. (2019), 57 French high school students were asked to identify quality issues for several documents in a simulated study assignment. Most students failed to detect features such as non-competent authors or outdated information. In a follow-up experiment, the authors showed that prompts directing students' attention to source features helped improve students' evaluation of information. If teachers implement structures that support students in attending to source information, students may take source information into account when evaluating information.

In a theoretical paper, List and Alexander (2017) proposed an explanation for the general failure to source by introducing four default stance profiles related to multiple source use: evaluative, disengaged, affectively engaged, and critical analytic. For example, a student with an evaluative default stance may routinely assess source features but lack the motivation to use them to integrate information and support multiple text comprehension. List and Alexander (2017) explanation corroborates findings from an interview study with 44 French and German ninth-grade students by Paul, Macedo-Rouet, Rouet, and Stadler (2017). The interviewed students reported being aware of sourcing strategies. However, they refrained from using them in a classroom setting due to a lack of motivation and encouragement from teachers.

### **3.2. Teachers' instructions in sourcing skills**

Teachers' motivations for instructing sourcing skills differ. When 18 Swedish and Norwegian upper-secondary school teachers were interviewed about their perceptions of critical reading, it was found that they invested time in instructing students in sourcing skills when national examination criteria emphasized such skills (Brante & Stang Lund, 2017). However, if national exams focused on other literacy competencies, for example, writing a short story, teachers perceived instruction in sourcing skills to be unessential. The interviewed teachers reported that they generally spent little time on teaching sourcing skills. The researchers argued that students may consider it unusual to spend much time on learning sourcing skills. This was the case in a study of 65 undergraduate pre-service teachers (Damico & Panos, 2016). The participants evaluated four web resources and repeated the evaluation three times. In their feedback, the participants communicated that they seldom spent such a long time on focused reading and the evaluation of only four online resources. To sum up, these studies show that there is room for teachers to consider more time on instructions in sourcing skills.

### 3.3. Specific instructions in sourcing skills

Instructions concerning the use of source information may be scant and inadequate. In the earlier mentioned review of 18 intervention studies targeting sourcing skills in text comprehension, Brante and Strømsø (2018) noted that scaffolds in the interventions failed to teach students *which* source features to focus on. Different source features can serve as tools for different types of interpretations, depending on the nature of the reading task or domain. More specific instructions may help direct students' attention to appropriate source features (Brante & Strømsø, 2018). An example of specific instructions is the use of prompts. In a study by Bråten, McCrudden, Stang Lund, Brante, and Strømsø (2018), 190 Norwegian upper-secondary students were presented with documents that pertained to familiar topics. Students received instructions to select 10 of the documents for solving an information task. A third of the participants received brief instruction to assess source credibility when selecting the information. This short prompt was found to affect the value students placed on authors' topic expertise (Bråten et al., 2018); students used the retrieved source information to exert a more accurate assessment of the document. This shows how essential it is to direct students' attention to source information when they select and evaluate information.

### 3.4. Prior beliefs and sourcing

Prior beliefs are yet another factor that has been found to affect individuals' comprehension and evaluation of controversial information. Recently, Maier, Richter, Nauroth, and Gollwitzer (2018) investigated how readers' in-group identifications and beliefs influence the comprehension of texts. In their study, 45 psychology students read text materials that consisted of two texts discussing the efficacy of two different types of psychotherapy. Before participants read the texts, their prior beliefs about the two different types of psychotherapy were measured. The authors found a strong belief consistency effect in readers' memory representation of controversial texts. This may be attributed to a defense mechanism activated when readers face belief-inconsistent information, which they strategically avoid processing. According to Maier et al. (2018), readers *can* disregard their beliefs when assessing the validity of arguments in social scientific issues. When confronted with belief-inconsistent information, paying attention to and memorizing source features may aid the evaluation and acceptance of belief-inconsistent information. Thus, the authors argued that the ability to use source features when selecting, reading, and writing is a valuable intellectual tool that should be taught in schools. The very same ability was taught to the students in this study.

The purpose of this study is to explore what type of sourcing activities students engage in after receiving instructions on sourcing. The following research questions were used:

- (1) How do students perform sourcing activities when selecting, reading, and integrating information in an open-inquiry group task?
- (2) Which sourcing activities were *least* prominent, and were they related to either the selection, reading, or integration of information?
- (3) Which sourcing activities were *most* prominent, and were they related to either the selection, reading, or integration of information?

By addressing the research questions, this study aims to make recommendations on ways to strengthen teacher instructions in sourcing skills.

## 4. Methods

To address the abovementioned research questions, this study used a qualitative case study approach. Case studies can provide detailed information about targeted topics (Yin, 2003) and are suitable when attempting to answer questions of "why" or "how" (Yin, 2009). A case study approach also supports illuminating the general via an examination of the particular (Denscombe, 2014). In this case, the general is the students' sourcing skills, and the particular is how different

student groups performed the task and how they reflected on their performance. As each group is treated as one case, it is also a multiple-case study. Yin (2003) has claimed that there are no sharp limits between a single-case study and a multiple-case study. Cases should also be circumscribed (Merriam, 2010). Thus, the cases were delimited with temporal boundaries and lasted from the moment the teacher distributed instructions for the task until the final grading. The data consisted of observations, interviews, and documents.

#### **4.1. Setting**

The open-inquiry group task analyzed in this paper took place during a six-week theory-based instructional intervention in a Norwegian upper-secondary school (for detailed information, see Appendix). The intervention focused on teaching students to pay attention to source features while selecting, reading, and integrating information (Bråten et al., 2019). Teachers instructed students to a) attend to available or accessible source features; b) use source features for the evaluation and selection of online resources; c) use source features when reading resources to predict, interpret, and evaluate content; and d) use source features to strengthen or weaken arguments when integrating retrieved information. After the instructions, the students practiced sourcing activities while completing an inquiry group task using the Internet as a resource. The teachers split the classes into groups of five or six students. Each group was assigned an assertion (“The Norwegian and Swedish languages should become one Scandinavian language” or “We should get rid of Nynorsk”<sup>1</sup>). Students were instructed to search the Internet for arguments to strengthen their assertions. The final product was to be a 15-minute oral presentation. The groups were instructed to complete a worksheet with questions about the validity and relevance of the source that was to be gathered by the teachers. One of the grading criteria for this task required the students to discuss how they had found and selected information. The degree to which they discussed and supported their processes in their presentations impacted their task grade.

In completing the task, students had the opportunity to use all the sourcing skills they had practiced. The task was not, in itself, the outcome measure of the intervention. For that purpose, students took a post-test and a delayed post-test. Outcomes from the pre- and post-tests for all participants and the whole intervention are reported in Bråten et al. (2019). Here, a qualitative perspective is applied via a multiple-case study to explore how sourcing activities were carried out by three student groups during the assigned task and why the students chose certain sourcing activities.

#### **4.2. Participants**

The participants in the current study was a subsample from the larger intervention. Participants in the current study thus comprised one teacher and 15 students (8 female, 7 male). The students were in their first year of upper-secondary school in Norway (mean age = 15.4 years old, SD = 0.5), and the teacher was their Language and Arts instructor. Before the intervention, demographic measures (gender, age, mother tongue) were collected. Students also took a reading comprehension test, a Norwegian version of a Danish cloze test in which they filled in word gaps by drawing bridging inferences (Gellert & Elbro, 2013). The results of the reading comprehension test, the percentages of native Norwegian-speaking students, and the students’ mean grades from primary school are displayed in Table 1 for the 15 participants.

#### **4.3. Data collection**

In case studies, researchers rely on “multiple sources of evidence” (Yin, 2003, p.13). Thus, data have been collected from three different sources: observations, interviews, and documents.

##### **4.3.1. Observations**

To facilitate careful observation of the students’ group work, three groups of students (from a total of six groups in the class) were observed. To avoid bias, the author decided before entering the classroom to observe the first three groups of students the teacher had formed. The naturalistic observations took place over three 90-minute lessons. During the first lesson, the observation

**Table 1. Participants’ pre-test results, mean grades, and first languages**

	<b>Reading comprehension (max score = 41)</b>	<b>Age</b>	<b>Mean grade from compulsory school (max grade = 6)</b>	<b>Norwegian as first language</b>
Group A (2 male, 3 female)	26.2 (SD = 8.07)	15.6 (SD = 0.55)	4.44 (SD = 0.17)	60%
Group B (3 male, 2 female)	27.0 <sup>1</sup> (SD = 8.71)	15.4 (SD = 0.55)	4.40 (SD = 0.40)	80%
Group C (2 male, 3 female)	26.5 <sup>2</sup> (SD = 3.31)	15.2 (SD = 0.45)	4.68 (SD = 0.30)	80%

<sup>1</sup> Only three students completed this test in Group B.

<sup>2</sup> Only four students completed this test in Group C.

focused on how the task was introduced; during the second, it focused on the students’ work; and during the third, it focused on the students’ oral presentations. The observer recorded what the teacher said and what the students asked or uttered, and she took notes of conversations that took place among the students during group work. During the third observation, the notes focused on how the students discussed and presented their sourcing processes.

#### 4.3.2. Interviews

The interviews were semi-structured (Brinkmann & Kvale, 2015), and all interviews were recorded and later transcribed. The teacher was interviewed after school hours in her classroom, and the interview lasted for about 30 minutes. The interviewer recapitulated the teaching sequence and asked the teacher to comment on it. The teacher was also given room to reflect on related topics. In addition, specific questions were asked targeting, for example, the planning of the task (e.g., How did you select these assertions?) and the teacher’s experience of the students’ performance (e.g., What kinds of questions did the students ask you during their group work?).

The students’ focus group interviews took approximately 15 minutes per group. The interviews took place in a group room during school hours. The student interviews comprised questions concerning sourcing activities, such as selecting information (e.g., What do you consider when selecting a resource?), reading information (e.g., How do you think source information can help us read and evaluate content?), and communicating information (e.g., What do you think about using source information when writing?). Some questions targeted the inquiry task specifically (e.g., “What do you think about the grading criteria?” and “What do you think the purpose of this task was?”). During the group interviews, the interviewer opened the discussion with a question and then let the students speak freely. If only one student answered a question, the interviewer made eye contact with other students and asked follow-up questions (e.g., “What do you think about that?”) to collect more perspectives.

#### 4.3.3. Documents

Text documents were collected and included the following: instructions, grading criteria, worksheets, students’ PowerPoints, and the teacher’s grade sheets. The PowerPoints also included some visual representations. The documents served as both data and memory support.

#### 4.4. Data analysis

Each group has been analyzed as a single case. This approach makes it possible not only to compare the cases (i.e., the groups) but also to discover whether they differed. Thus, the multiple cases studied in this paper are the three student groups and their handling of the task, as described earlier in the paper. The teacher was also interviewed about her experiences with the sourcing intervention in general and the group task in particular.

All data were treated as equally important. All transcripts and written materials were read carefully several times using a theoretical thematic analysis approach (Braun & Clarke, 2006). After familiarization with the whole data set, one group at a time was focused on. The reading centered on the different sourcing activities students had been taught: the use of source features when a) selecting, b) reading, and c) integrating information. According to Braun and Clarke (2006), a theoretical thematic analysis is mostly “driven by the researcher’s theoretical or analytic interest in the area” (p. 84), with the researcher coding for a specific research question.

#### 4.4.1. Coding

When the data contained a phrase or statement mentioning how to use source features for selecting, reading, or integrating information (e.g., “I check if it is recently published”), the statement was marked and coded for the content it contained (e.g., “evaluating publication date”). Then, all codes were revised and clustered to develop themes capturing the unique characteristics of each case and answering research question 1: *How do students perform sourcing activities when selecting, reading, and integrating information in an open-inquiry group task?*

To determine which of the sourcing activities taught was most or least present (research questions 2 and 3), the codes were scored for either selecting, reading, or integrating, and percentages were calculated for each activity. Finally, to deepen the analysis, a cross-case theme was sought.

### 5. Findings

The demographic data showed small differences between groups. Group B performed slightly better on the reading comprehension test, while group C had slightly higher grades from high school. Group A had a more substantial proportion of non-native speakers in their group. However, all these students attended a high-stakes school. In all, the demographic data did not show any clear trends in group differences that could have affected the results.

To answer research question 1 regarding how students performed sourcing activities—the codes were clustered into themes. The focus on visible and/or stated sourcing activities differed between groups. The themes have been named goal-orientated selection, broad repertoire of sourcing activities, and checking source features. The names represent the primary strategy performed by students. Each theme is described and presented in Table 2 in the same order as the groups performed their presentations.

#### 5.1. How students perform sourcing activities

The three themes display how the groups performed sourcing activities, and they will be elaborated in the following section.

The theme *goal-orientated selection* represents an understanding of how to select sources for a specific purpose. The purpose could be either to make well-grounded selections of sources or to take shortcuts in schoolwork. Group A’s assertion was the following: “We should get rid of Nynorsk.” They understood this as a position for which one could be either for or against. Consequently, they set as a goal to search specifically for viewpoints on the issue and used text type as a source feature for their search. They selected the date of publication as another prominent source feature and searched for current views by selecting newly updated resources over older ones. During the oral presentation, the students’ motivation for selecting sources was expressed as “It was published recently, so it is good.” Though the motivation for their selection approach was unclear in their presentation, during their interview, they added information about why they chose to highlight recently published resources, particularly opinions from young people (a largely unsuccessful search). The group’s particular selection focus failed to integrate sources. The teacher stated that “their argumentation could have been deeper,” noting that the students understood what “a source is but not how to use source features in texts.” The students presented their source information separately from their content, listing all their references in the final slide

**Table 2. Description of themes with examples**

Group	A	B	C
Theme	<b>Goal-orientated selection</b>	<b>Broad repertoire of sourcing activities</b>	<b>Checking source features</b>
Description	Using specific source features to select resources for a particular purpose	Adjusting and varying sourcing activities depending on the task or the goal	Determining resources' trustworthiness by using internal checklists without integrating information
Examples from student interviews Examples from teacher's grading	<p>"We looked for personal meanings about our statement, pro or con, so we tried to find resources where people expressed their opinions."</p> <p>"It was important to have an updated source. The discussion has changed, so it could have been very different if we had not looked for an updated source."</p> <p>"Explicated why they have selected the specific resources."</p>	<p>"If you read something on a blog and think, 'I am not sure if I believe this,' then you can use the text on the blog to search for more info and see if you find more credible resources than a blog is."</p> <p>"... the way we write essays, that we write 'according to XX' and such, and the way we present sources in the text. It should not be only links; it should also be the author."</p> <p>"Arguments are elaborated, articulated, and often reference the resource where you found the argument."</p>	<p>"... if it is written in a newspaper, like <i>Aftenposten</i>, because they should not have published anything without being sure that it is true, as there are so many reading <i>Aftenposten</i>."</p> <p>"From which website is this? If there is a well-known site, fine, but if it is, for example, a blog, I would think more like I am not sure if this is a trustworthy source."</p> <p>"Lacked a discussion of why you find certain websites trustworthy."</p>

of their seven-slide PowerPoint. They declared how they were more eager to demonstrate their selection of resources when grades were involved "and the teacher ask[ed] for it." They revealed that they "did it [checked source features] when we had that task, but not anymore." Students in Group A needed prompts to perform all the sourcing activities they had practiced during the intervention.

In contrast to the above-described theme, the codes for Group B revealed a pattern of using multiple tools when reading and evaluating information, leading to the theme *broad repertoire of sourcing activities*. In addition to using the most common strategy for reflecting on the author, the students also acknowledged using strategies involving visual inspection, noting that, "for example, [in] blogs, there may be another type of font, colors here and there," and revealed paying attention to language markers: "If you read lots of 'I think,' 'I mean,' 'I believe,' compared to an article where it says 'according to XX.'" Students also performed backward searches: "If you read something on a blog and you are not sure whether to believe it, you can use the text on the blog to search for more information and find more credible resources than a blog." And they corroborated between sources: "You ought to find three to four resources and compare, and then, you'll see which one you think is most credible." This variation in the students' performance of sourcing strategies seemed to positively affect their integration. The observation notes revealed that the students in this group used content from resources in their argumentation and interwove found information with their own personal views. When presenting arguments, they displayed more than one perspective. The teacher asserted that the students in Group B succeeded in integrating arguments and that their arguments were "elaborated, articulated, and often referenced the resource where [they] found the argument." The students were also able to connect claims with their authors. The teacher pointed out that, if the students could do this orally, they may likely do it in writing.

In the last theme, *checking source features*, students displayed more superficial performance of sourcing activities. This theme involved checking the trustworthiness of resources in a truncated way. Students executed a “check-up” of one source feature, but stopped before reflecting on its significance. The students in this group probably knew more than they showed during their presentation. In the interview, they reported that “it was good that we talked about it so we could explain why we had chosen that particular resource.” Concerning some of their selections, they also conveyed that checking the publication date was not enough and that it was necessary to consider whether content might have changed over time. However, the teacher was not satisfied with their explanations during the presentation and asked questions like “Why is a website trustworthy?”; “Why do you perceive a particular website as a trustworthy resource?”; and “Have you cross checked your results?” It was obvious in their presentation that they did not go “behind” the first source information they found (e.g., the name of a website) to examine the source’s publisher or owner. Their strategy was to check source features to determine trustworthiness quickly. After establishing a source’s trustworthiness based on superficial sourcing criteria, they halted their search: “If we find a trustworthy resource, which is written by a researcher and on trustworthy websites, we select it.” Thus, though the codes in this theme reflect constant use of source features when checking for trustworthiness, they also reveal that these students did not reflect on the results of the checked trustworthiness. In other words, they were less diligent in re-reading information in light of their evaluation.

### **5.2. Cross-case theme: sourcing is related to schoolwork**

In all three groups, students conveyed that including references in texts is a nuisance that steals time from the actual writing process and disrupts the flow of the text, but they saw this sourcing activity as being useful for strengthening arguments, giving credit to the original author, and learning the referencing practice in preparation for university studies. Simultaneously, the groups’ interview answers showed that they would not engage in sourcing activities outside of school and school tasks. The students performed them primarily to achieve good grades and to meet their teacher’s demands.

### **5.3. Comparing themes**

The themes displayed different levels of sourcing skills. The theme *checking source features* represented a more mechanical sourcing activity, while the theme *goal-orientated selection* employed a strategy to achieve a pre-determined goal. Only the theme *broad repertoire of sourcing activities* illustrated how students could shift between sourcing activities and integrate them into their reading strategies. The themes, in this order, represent a hierarchy that illustrates the development of sourcing skills from more mechanical checklists to choosing a specific strategy for a certain goal and to finally moving freely between sourcing activities depending on the situation.

### **5.4. Least and most performed sourcing activities**

The students received instructions on how to use source information when selecting, reading, and integrating information. Previous studies (Brante & Strømsø, 2018) have put less focus on the use of source information concerning reading and integrating information. Research questions 2 and 3 explored whether students engaged in those types of sourcing activities and which sourcing activity students applied most. It should be noted that students worked independently without explicit prompts during the group task of framing the data collection. To determine which of the taught sourcing activities were the least, and respectively most, present in students’ group work, the codes were scored for either selecting, reading, or integration. In all, there were 89 codes distributed over the three cases. Of these, 48% concerned source activities when selecting information, 17% concerned source activities when reading, and 35% concerned source activities when integrating information. Not all of the codes for integration were positive. For example, four instances described the students’ irritation concerning the need to use references in their texts or presentations. To sum up, these scores reflect how students’ sourcing activities mostly concern the *selection* of resources and that they rarely attempt to read documents in the light of source features.

## 6. Discussion

This multiple-case study explored how three groups of students performed sourcing activities when selecting, reading, and integrating information in an open-inquiry group task (research question 1). The three groups received the same type of instructions, yet they differed in sourcing skills. The different levels of sourcing are not explained by the groups' differences in reading skills or grades, as the groups were rather homogenous. Moreover, the study examined which of the involved processes (selecting, reading, integrating) were least, and respectively most, prominent in the sourcing activities (research questions 2 and 3). Here, the groups showed the same pattern as in earlier studies (Brante & Strømsø, 2018)—a strong emphasis on using source information when selecting information. The main conclusion from these results is that students have absorbed sourcing instructions to some extent, but to assure continued growth in sourcing skills, perpetual and simultaneous feedback and discussions are needed. When solving the group task, students worked independently, and feedback was given in conjunction with the exam. This work mode meant two things: first, if a group chose a less successful way of using sourcing information, the teacher did not interfere by suggesting alternative routes, and second, feedback in relation to task fulfilment is less motivating than feedback during the process. In the following, I will discuss two aspects of the findings: the different levels of sourcing skills and how motivational factors matter for engagement in more cognitively demanding sourcing processes.

Regarding the different levels of sourcing skills, it was found that some of the taught sourcing activities (e.g., noticing source features, such as authors or publication dates) were executed mechanically. These sourcing activities were visible in the collected data, and the students exhibited a familiarity with basic sourcing procedures. The theme *checking source features* describes how the students routinely assessed source features but paused before actually reflecting. The theme *goal-orientated selection* describes how the students rationally focused on a particular source feature. These findings support what List and Alexander (2017) have characterized as students' default "evaluative" stance. Evaluative students have "well-developed habits associated with diligent, evaluative source use" (List & Alexander, 2017, p. 187). However, as the authors have pointed out, students may be somewhat immature when it comes to text evaluation.

When Wineburg (1991) coined the term "sourcing," he compared expert readers to high school readers and found that the former utilized different strategies, including sourcing. In other words, sourcing is a reading strategy that expert readers have developed over years of training, and it would be somewhat unrealistic to expect upper-secondary school students to display a high level of skill in this strategy. However, the first step—an evaluative stance—is essential. As a first step, students must begin to notice (more) source features, evaluate them, and predict the content of a document by evaluating specific source features. Most of the reading in which students will engage during their school years will involve multiple documents, and the central part will involve online documents. It is, therefore, hoped that students would gradually become more attentive to source features.

Another interesting finding concerns differences in the grading of the oral presentations. Students were expected to dedicate one part of their presentation to explaining their motivations for selecting their resources. Group A, which reported the most source features, received the lowest grade. Their goal-orientated selection of resources was not apparent during their presentation. Group B, which was most successful in integrating resources and using source features in argumentation, received the highest grade, despite providing little information on their resource selection process. It was evident that the teacher valued integration. However, successful integration is preceded by thorough groundwork, such as evaluation of trustworthiness and the critical reading of information. Such groundwork is typically not visible in an oral presentation; rather, it may be *perceived* by the audience as a quality in a presentation. In the task, students were expected to visualize their groundwork. Thus, they were "forced" to explicate and explain their motivations for their resource selection choices. During an initial learning stage, these steps might

be fruitful. In the long run, students should not burden their products with explications or motivations. Instead, sourcing skills should become visible through the quality of their work.

The second and third research questions concerned which of the sourcing activities taught was the most and least observed. This has already been touched upon in the discussion of the evaluative default stance and the visibility of the more mechanical source selection. It is of interest to reflect on why students do not invest in the more cognitively demanding processes of reading and re-reading information in light of source information. The DMF (Britt et al., 1999; Perfetti et al., 1999) notes that good readers integrate information from several documents to arrive at a more global understanding by, for example, connecting source information to content (via an intertext model). Generally, readers will only engage in creating an intertext model when it is relevant to their goals or reading task (Britt & Rouet, 2012). The relevance of the group task, and whether the students felt motivated to read about their specific assertions critically, remains an open question. In this task, as in many school tasks, the question was not initiated by the students; thus, it is unclear whether the students' motivation to complete the task was intrinsic. Second, it was obvious from the interviews that the assigned assertions did not evoke any deeply felt concern or pressing need for an answer. Some students felt that their assigned assertions directly opposed their personal views. Thus, the students' motivation to find and evaluate source features might have been extrinsically driven (i.e., by grading criteria). The students knew that they had to present at least three resources and explain, by discussing the source features, why they had chosen these particular resources. Being graded was sufficient motivation for the students to diligently but mechanically perform what was expected of them; however, the students were not motivated enough to engage in more reflective or sophisticated processes. List and Alexander (2017) have shown that motivation, interest, and attitude may encourage a shift in the default stance (e.g., a student's interest in an issue may move him or her from disengaged to engaged). It is less likely that a student will shift from an evaluative stance to a critical analytic default stance by chance. Instead, this default stance demands a combination of well-developed evaluative habits and affective factors. According to List and Alexander (2017), students should be interested in their task and in solving discrepancies among documents to arrive at a deeper understanding. In other words, if students are given simultaneous opportunities to discover discrepancies among documents, form source-content links, and create a global understanding of an issue, they may have a positive experience that will motivate them further. Such experiences take time. Damico and Panos (2016) showed that it is rare for schools to devote much time to discussing and reflecting on the selection of online resources. Concerning engagement, structured discussions and collaboration in pairs or small groups can facilitate students' regulative behaviors when they search the Internet (Lazonder, 2005) by encouraging them to articulate their thoughts.

One of the limitations of this small-scale study is that it is not possible to generalize the results. Instead, it is more appropriate to think of the results and implications as transferrable. Besides, there is a risk that the researchers have biased the interpretations of the interview data and observations. To mitigate this issue, multiple data sets have been used. Furthermore, a detailed description of the data-coding process has been provided.

## 7. Conclusions

It is clear that students need motivation and continuous support to perform advanced sourcing activities. If students are not engaged in the task at hand, they succumb to simpler and more mechanical source activities, such as checking the author. It is also of utmost importance that students perceive sourcing as an activity valued by their teachers. If not, they have little incentive to engage in the more cognitively demanding process of sourcing.

## 8. Implications for teaching

The invisible processes students perform when sourcing needs to be visualized. Learning situations *should* require students to discuss and compare their selections of Internet resources, their

understandings of content, their knowledge of how to interpret content in light of source features, and more. Thus, visualizations may be achieved through activities as modelling, practicing, worksheets, and discussions. Visualizations are essential, as are teachers' abilities to communicate that sourcing skills matter when students use computers and go online to complete open-inquiry tasks.

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#### Notes

1. Norway has two official languages: Nynorsk and Bokmål. All students study and receive grades in both languages.

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