

ORIGINAL ARTICLE

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# Engaging upper secondary school pupils with integrity and source criticism

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## Abstract

The ambition of the article is to create an awareness among upper secondary school pupils on what academic integrity and source criticism mean. Instead of devoting time to a general presentation of academic studies, the claim is that a collective reflection based upon the common practices of pupils (sources) could be efficient to describe the outlines of academic integrity. An action research was made in 2019 and 2020 among Swedish upper secondary school pupils with the help of an instructional video on sources, academic integrity and plagiarism. It revealed a consensus on the notion of source criticism. Furthermore, the findings show that a majority of pupils used platforms such as Wikipedia to get a quick access to facts without daring quoting them in a work for school. This gap represents an opportunity to introduce academic integrity in a very concrete manner with an insistence on the necessity of citing all the sources that contributed to the elaboration of a work.

**Keywords:** Academic integrity, Source criticism, Secondary school, Plagiarism, Wikipedia

## Background and introduction

Many universities proposed standards and guidebooks to avoid plagiarism and academic misconduct (Whitley & Keith-Speigel 2002; Carroll & Zetterling 2009; Bendixen et al. 2022). In this perspective, universities develop a more positive discourse on academic integrity to empower students with successful learning strategies (James 2018, p. 44) and avoid the simple logic of punishment (Bertram Gallant et al., 2020, p. 61). The existence of centres of academic writing is an important tool to help students to acquire this academic integrity and get trained to produce original texts in their respective fields (Bowman et al., 2018; Power 2009, p. 659; Karlsson 2019, p. 43; Hellman & Thorsten 2021; Kaufhold & Yencken 2021). In Sweden, all the universities have these structures and provide information about the consequences of plagiarism but the reports of the Swedish Higher Education Authority still point out an increase of cases of plagiarism that are subject to disciplinary sanctions. In 2019 and 2020, 2.466 cases (0.79% of all the 312.705 students who were registered) were submitted to a disciplinary board, around 54% of the cases concerned cheating and plagiarism issues (Swedish Higher Education Authority, 2021, p.8; Asplund 2021). In comparison



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with 2018 where 1.326 cases were submitted (0.46% of all students registered), it is an increase of 54% (Swedish Higher Education Authority, 2018). In 2015, there were 880 cases against 790 in 2011 (Karlsson 2019, p. 33). It means that in the last decade, there was an increase of 312% of all disciplinary cases, of which a significant proportion was due to plagiarism.

It is striking to see this increase of plagiarism in a country where the general discourse on fraud is perceived as way of cheating taxpayers and questioning a sense of solidarity (Lundström, 2013). Furthermore, source criticism is part of the course syllabi at the primary and secondary schools. In fact, the Swedish Agency for Education emphasized source criticism in the last reforms of course syllabi in 2011 (Sundin & al., 2016) and 2018 with the acquisition of a basic digital competence (Sundin 2019). Sweden is a country where policies of digital competence have been implemented at school for pupils, teachers and leaders since the 1960s (Hanell 2018; Lind, 2019; Olofsson et al. 2021, p. 322). Secondary school pupils are thus encouraged to select and investigate the sources during their studies in order to question given discourses in different fields (McGowan 2005). Moreover, at the university level, students are expected to be able to find reliable sources in the essays they write (Li et al. 2012, p.167; Lewoniewski et al. 2020; Kasler et al. 2021). Many universities organize visits for high school students or research days to make them aware of career opportunities but also scientific practices (Diehl et al. 2016, p. 47; Sultan et al. 2020). During these welcoming seminars, it is not really common to have a presentation on academic integrity. Consequently, there might be a gap between secondary studies and higher education when it comes to the awareness of what plagiarism is (Lim 2013; Richards et al 2016, p. 245). It may explain the need to explore the ways to inform secondary students on academic integrity without mentioning the punitive dimension (Skaar et al., 2013, p. 20). Recent studies have focused on the necessity of fostering a pragmatic and critical pedagogy to talk about plagiarism, patchwriting strategies (Carroll et al., 2009, p. 15; Pecorari 2003; Prentice, 2018, p. 5; Premat 2020), information seeking and source criticism (Gray et al. 2008; Li & Casanave 2012; Du 2022). Plagiarism is a problem which is faced in high school and some habits can already be crystallized under these years (Dias et al., 2014, p. 2601). In addition to this, the culture of personal success that exists in different contexts is a risk factor that may lead to these habits as Demerath concluded from his investigation of elite high schools in the United States (Demerath 2009). This is why it is essential in plagiarism issues to create a path of integrity between high school and university (Wangaard & Stephens 2011; Griffin et al., 2015; Wangaard 2016, p. 432). Plagiarism is here defined “as submitting someone else’s work as one’s own, even though part or all of the work is not self-produced text” (Bendixen et al. 2022, p. 6). The aim is to benefit from others’ work in order to get a better grade (Li & Casanave 2012). The intention to deceive is condemned but plagiarism also includes patchwriting strategies when students borrow fragments of text and make up a new text without giving appropriate attribution (Pecorari 2015). As Chankova proposed, “using text without proper attribution with the intention to deceive is called prototypical plagiarism, whereas in cases where such an intention is irrelevant – textual plagiarism – is also used as an umbrella term, covering both prototypical plagiarism and patchwriting” (Chankova 2017, p. 2). In an academic context, plagiarism is linked to the act of copying someone else’s production disregarding the origin of the source (a copyrighted book or a student production).

The claim of this paper is that there is a need to discuss the study technique of secondary school pupils in connection with the expectations of studies at the university. Most of pupils have a “general competence” (Davies 2013) on information seeking that they should question, contextualize and adapt to their future studies at the university (Okoro 2011). How do pupils search information? What is their strategy and how is it possible to open a dialogue on sources and fake news? The assumption is that by having a dialogue on their own way of searching information, it is possible to disseminate at an early stage a discourse on academic integrity and scientificity that can even make the university more attractive (East 2009). Whereas some studies focus on the social pressure of the results that explain why secondary school pupils may cheat (Anderman et al. 1998; Galloway 2012, p. 391), the goal is here to analyze how these pupils perceive their own study technique. The current investigation is an action research dedicated to source information with the help of a short movie on plagiarism which was specifically created for upper secondary school pupils. The short movie was created in December 2018 with the help of the Centre for the Advancement of University Teaching of Stockholm University. The film lasts six minutes with several sequences on source criticism and a series of instructions on the best ways to achieve academic integrity and avoid plagiarism.<sup>1</sup> Many universities provide instructional short movies to introduce freshmen to academic integrity as it is the case for instance for RMIT University in Melbourne,<sup>2</sup> the University of Derby in England<sup>3</sup> or the online program of Mercy College in Dobbs.<sup>4</sup>

The action research is described as an intervention to modify the perceptions of academic integrity by secondary school pupils (Fish & Hura 2013). This methodology is appropriate to prepare these pupils in critical thinking that they will use to transform mentalities in higher education (Gayá & Brydon-Miller 2017, p. 40; Velliariis 2015). The secondary school pupils had to watch the movie during the seminar and then they had to fill out a questionnaire where they were invited to question their behaviors regarding how to find appropriate sources. The questionnaire was not only a quiz testing what they learnt in the movie, it was also an invitation to explore their praxis when they collect sources. By reflecting on their current learning strategies, they can have an insight on the attitude to have to start college (Mol & van den Hoven, 2022). Instead of promoting only a code of conduct (Cerdà-Navarro et al. 2022), this paper highlights the necessity of having presentations of university studies that concretize the notion of academic integrity.

### Data and method

Two sets of data were collected in 2019 and 2020 with each time three first-year secondary school classes from a Swedish high school. The data are available in Open Access (Premat 2022). The surveys were anonymously obtained with the help of a public link

<sup>1</sup> <https://www.youtube.com/watch?v=pCd0oAJlxyI> (Accessed on 7 December 2022, 6 min). The movie was produced by Jonas Collin and funded by the Centre for the Advancement of University Teaching of Stockholm University.

<sup>2</sup> <https://www.youtube.com/watch?v=8AKdsDMPv20> (Accessed on 16 December 2022, 2 min 20 s).

<sup>3</sup> <https://www.youtube.com/watch?v=0DwrnTXX7E> (Accessed on 16 December 2022, 4 min 13 s). In this case, it is interesting to see who testifies on academic integrity. The Dean of the University, the academic staff (three researchers from three different faculties, the Faculty of Humanities, the Faculty of natural sciences and the Faculty of law and social sciences), three students and an academic librarian give their interpretation on academic integrity.

<sup>4</sup> <https://www.youtube.com/watch?v=dRRUeCEUm5E> (Accessed on 16 December 2022, 3 min 55 s).

which means that the respondents did not need to fill out any information related to personal data according to the principles of transparency and accountability of the General Data Protection Regulation (GDPR).<sup>5</sup> It is impossible to attribute the answers to the respondents and no questions were raised on the gender of the respondents. The confidentiality of the answers was guaranteed during the collect of data (Robinson 1996, p. 43). Furthermore, the name of the Swedish high school was deliberately not mentioned. The teachers in charge of the classes were informed about the work on the perceptions of academic integrity and presented the project to their pupils. The school is a general and public high school in the suburb of Stockholm with around 1.200 pupils.<sup>6</sup> According to some official indicators, the municipality is a middle-sized one with no big social problems. The segregation is limited in this area as the index of inequalities has a score of 29%.<sup>7</sup> In addition to this, the main specialties (natural sciences, economy and social sciences, literature and aesthetic programmes) are represented in this school. The guidelines of the Swedish Ethical Review Authority regarding research in social sciences were strictly followed (Wetterberg 2004, p. 30). The teachers had already informed the pupils on this introductory seminar on academic integrity and no psychosocial questions were included in the short survey.<sup>8</sup>

The first phase was devoted to the creation of a short movie that presented academic integrity and focused on source criticism. The second phase was elaborated with the teachers who contacted the University for a presentation on academic studies. The idea and the questionnaire were co-constructed with the teachers so that the secondary school pupils could be engaged in a discussion on academic integrity. Furthermore, the teachers paid attention to the ethical aspect so that no question could affect the psychosocial state of their pupils. The third phase concerned the venue of secondary school pupils (four classes) to the campus with a presentation on academic integrity and a screening of the short movie. The pupils were informed that they would have the possibility to answer to a questionnaire after the seminar. The fourth phase enabled to collect the answers from the participants. The same approach was followed in 2020 for the seminar and the survey as it is indicated in Fig. 1.

The pupils watched a short movie on source criticism and had to fill out a survey that was composed of five questions. The questions were about sources, plagiarism and fake news; the purpose of the questionnaire was to facilitate the understanding of the notion of plagiarism in order to engage a reflection on source criticism and academic integrity.

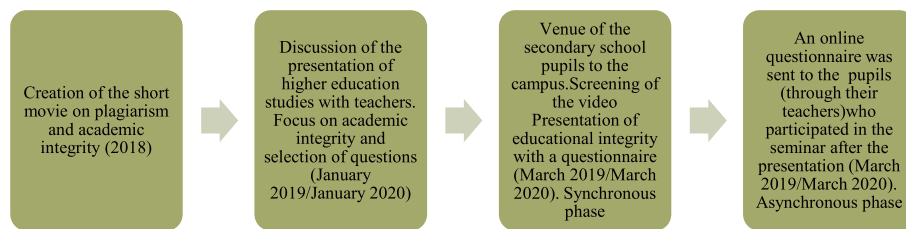
- 1) After watching the short movie, can you define what plagiarism means?
- 2) Which sources do you use most? Why?
- 3) Do you think that it is acceptable to use a Wikipedia source? Exemplify your answer
- 4) In the short movie, when was defined the notion of plagiarism?
- 5) What is the best way to fight against fake news?

<sup>5</sup> The article 5 of the GDPR concerns the principles relating to processing of personal data, <https://gdpr-info.eu/art-5-gdpr/> (Accessed on 7 December 2022).

<sup>6</sup> In the Swedish system, the schools are either independent or under the responsibility of the municipality since the reform of 1992 (Böhlmark et al., 2015, p. 508).

<sup>7</sup> <https://segregationsbarometern.delmos.se/> (Last accessed on 13 December 2022). Many studies focus on the social segregation in Swedish schools with the reforms engaged in the 1990s where parents can choose any school (Lind, 2017).

<sup>8</sup> <https://fra.europa.eu/en/publication/2019/child-participation-research;> <https://etikprovningmyndigheten.se/en/> (Last accessed on 12 December 2022).



**Fig. 1** The main phases of the collection of data. Source: summary of the different phases of the project

There were 79 pupils who took part in the questionnaire in 2019 and 77 in 2020 who were in between 16 and 17 years old. The same high school teachers were involved in the experimentation in 2019 and in 2020. In 2019, 12 pupils did not take part in the questionnaire whereas 8 pupils did not fill out the questionnaire in 2020. The questionnaires were anonymous as the participants received a link from the software Survey&Report. The following mentions appeared for the participants before they started to answer the questions: “Stockholm University is responsible for the processing of personal data that takes place in ‘Survey and Report (...). The information will be processed in a way that ensures that unauthorized persons cannot access it.”<sup>9</sup> The software Survey&Report is a digital device used by some Swedish Universities to create surveys, collect data and publish reports.<sup>10</sup> The choice of open questions was motivated by the fact that the pupils were in the classroom and watched a movie that presented the outlines of academic integrity (Baburajan et al. 2022). The pupils could expand their comments after the screening of the short movie and the discussion in class. Only one closed question was incorporated in the questionnaire to make sure that the pupils did understand the short movie. Last but not least, the presentation and the questionnaire were in Swedish. The questionnaire and the comments of the secondary school students were translated into English for the purpose of the current research. The method of action research was selected in order to awake the curiosity of high school pupils so that they could discuss the outlines of academic integrity. The principle of action research is defined by the fact that the research has the ambition to modify the perceptions of academic integrity, collect data on behaviors and empower secondary school pupils so that they assimilate and contextualize a discourse on source criticism and scientific investigation. The dimension of empowerment is decisive to succeed with an action research (Strumińska-Kutra et al., 2022). By integrating high school teachers and pupils in the elaboration of a discussion on academic integrity, it was possible to link the expectations of higher education institutions to the discourse that the pupils heard during their studies in school. The action research is one of the possibilities to avoid the gap between high school and higher education when it comes to the use of sources and academic writing. The intervention on the perceptions of participants is the main aspect of the research action dispositive.

<sup>9</sup> Preliminary paragraph that the participants had to agree before accessing the questionnaire.

<sup>10</sup> <https://www.kau.se/student/ar-student/it-stod/tjanster/survey-report> (Last visit, 29 April 2022).

**Table 1** Ten recurrent words in the whole surveys of 2019 and 2020

Words	Number of occurrences
Source	419
Wikipedia	247
Information	182
NE (National Encyclopedia)	108
Fact	50
News	46
Thing	43
Text	33
Page	28
People	27

Source: Analysis of the whole survey with the help of the software Tropes

Beyond the pragmatic aspect of the action research, the objective was to prepare students to question their own information-seeking practices.

In the short movie that was shown to the pupils and available on YouTube, plagiarism problems were connected to the necessity of citing all sources. The movie proposed in Swedish an history of plagiarism within different periods (Antiquity, Renaissance, Enlightenment) with recommendations on source criticism. The movie could awake a discussion on study technique so that the pupils could comment how they were used to seek information (Peters & Cadieux 2019). It defined what plagiarism was and it gave an insight on the historical debates on the question of copyright issues. The movie was followed by a presentation on the principles of academic integrity. After the presentation, the pupils had to fill out a questionnaire so that they could compare their study technique with what is expected at university. Since the same questions were asked to participants in 2019 and 2020, the results were aggregated with the help of the softwares Freewordcloudgenerator and Tropes to be able to identify the reference fields and scenarios. The objective was to project the narratives in a cloud analysis to visualize the amount of recurrent utterances.

### Findings

The results were analyzed in two different steps, first a global phase where the recurrent references were noted and then a phase where the focus was on the answers to the specific questions. In the whole surveys from 2019 and 2020, “Wikipedia” is named 247 times in the narratives of the participants whereas the Swedish National Encyclopedia ([www.ne.se](http://www.ne.se)) appears at 108 occasions. Table 1 gives a projection of the ten main words that were used by the respondents.

This analysis highlights the way the factual information is searched by secondary students as “source”, “Wikipedia”, “Information” and “Fact” appear most of the time. A study of the modalities reveals that in 19.8% of cases (216 occurrences), the adverbs reflect a time procedure.<sup>11</sup> It means that secondary school pupils hierarchize their actions when it

<sup>11</sup> The information on sequences, modalities, verbs and scenarios was provided thanks to the use of the software Tropes which is specialized in lexicometry.



**Table 2** Answers to the question on the definition of plagiarism (according to the short movie, when was the notion of plagiarism defined?)

Definitions of plagiarism	2019	2020
Renaissance	7 (8.9%)	9 (11.7%)
Antiquity	44 (55.7%)	31 (40.3%)
After the Enlightenment	28 (35.4%)	37 (48.1%)
Under the Russian revolution	0	0
Total	79 (100)	77 (100%)

Source: answers of Swedish secondary students in 2019 and in 2020

comes to the search of information. For instance, the adverbs “before”, “after”, “actually”, “usually”, “often” are regularly named to specify the temporal sequencing of the selection of information. Then, there were 17.8% of adverbs of manner (195 occurrences) which were related to the way the secondary school pupils selected the information. The analysis of remaining modalities showed that 16.2% of expressions (177 occurrences) were associated with assertions which is not surprising given the type of questions whereas 2.3% of the utterances (25) expressed a doubt. However, it was striking to notice that 246 meanings (22.5% of the modalities) were negative. In this perspective, the negation includes a feeling of cautiousness where secondary school pupils evaluate the relation to the sources and understand what is expected from them. In addition to this, it is a direct effect of the action research as they were influenced by the short movie. They had to mobilize a capacity of judging and their comments could be more accurate in this perspective. Table 2 compares the answers to the closed question on the short movie given in the surveys of 2019 and 2020.

It is surprising to notice that the respondents were hesitating between Antiquity and the Enlightenment. It is due to the fact that the movie introduced the discussions on original/copy for the Antiquity and emphasized the discussions on copyright issues during the nineteenth century with an example around the fight of the writer Charles Dickens. The respondents of 2020 had a majority of wrong answers for this question, but the objective of that sequence was to help them to focus on the movie. The errors were also understandable as the questionnaire was filled out after the discussions.

The first open question was about the sources that they used most. Not surprisingly, Wikipedia was the first source that was mentioned, far away before the online Swedish National Encyclopedia (*NE*) and other common sources for the high school such as *SO-rummet* (social sciences).<sup>12</sup> Figure 2 helps to visualize the sources but also the words that reflect the explanations of the participants.

The words “sources” and “information” are also recurrent in the narratives of the secondary school pupils. The connector “and” comes back often, the pupils name a platform of information and complete it with other examples. The first type of sources that students consult are websites with a positive attitude on Wikipedia. “Wikipedia mostly as it provides good general information about most things. I generally use the first source that comes up” (example 1, survey 2019). This statement is confirmed by other respondents who reveal a common praxis: “Wikipedia because it usually has the most

<sup>12</sup> <https://www.so-rummet.se/>; <https://www.ne.se/> (Last visit, 29 April 2022).



**Fig. 2** Which sources do you use most? Why? Source: Recurrent keywords in the answers of Swedish secondary students in 2019 and in 2020

information. It is also usually the first option when looking for something” (example 2, survey 2019). The association with the adjectives “fast” and “quick” is illustrated in many other responses: “Wikipedia is my main source for checking out quick facts” (example 3, survey 2019). In some responses, the actions of the secondary school pupils are commented: “I usually use google, then I google what I am looking for and can take from various sources as *Svenska Dagbladet*” (example 4, survey 2019)<sup>13</sup>. Another response explains the reason why the information is not searched outside Wikipedia and internet sources: “I do not really have time to sit down and read like a book and use it as a source” (example 5, survey 2019). Wikipedia is described as an important source where it is possible to check general facts (Agarwal 2019). “I use Wikipedia because it is so accessible. I know that the facts are not always correct, but because so many people use that source and check it often, so I usually take it for granted that the information is quite accurate” (example 6, survey 2020). The trustworthiness of the source is here linked to the fact that many people use it. The perceptions of Wikipedia by pupils are quite positive, even if the short movie provided strong recommendations on the use of sources. In recent studies, some scholars showed that students had a negative perception of Wikipedia sources as if the discourse on academic integrity already had an impact on their capacity of criticizing sources (Premat 2020, p. 204; Konieczny 2021, p. 156).

All these answers show that there is an established praxis to work with Wikipedia. “I use Wikipedia because it often presents simple explanations, short summaries and there are answers to most things” (example 7, survey 2020). In this comment, the pedagogical support of Wikipedia is underlined but at the same time, there is a challenge as Wikipedia gives “answers to most things”. The other sources are the National Encyclopedia which also share the same characteristics than Wikipedia with an easy and clear access. One respondent made a clear difference between Wikipedia and the National Encyclopedia: “the National Encyclopedia is connected to school which makes it a more reliable source” (example 8, survey 2019). Another response confirms the privilege of this source

<sup>13</sup> *Svenska Dagbladet* and *Dagens Nyheter* are two well-established newspapers in Sweden.





the word “source” in the answers to this question for Swedish high school pupils taking part in the survey in 2019 and in 2020.

There is a split between a group of secondary school pupils who see Wikipedia as a practical and reliable source and another group who is unsure about the consequences of using Wikipedia (Blikstad-Balas 2016). When the detailed answers are analyzed, there are interesting analysis that come up. Even the positive answers include the necessity of being cautious and a slight hesitation. “Yes, as long as you have compared with other sources and judged that it is reasonable and there is a reliable writer” (example 14, survey 2019). Most of the answers are nuanced, showing that the pupils have a critical capacity, they rarely consider Wikipedia as a non-problematic source.

In addition to this, some answers question the exactitude of the source: “yes, I think that it’s OK to quote, but then you have to keep in mind that the information does not have to be completely correct. I think you should compare with another source if you choose to quote Wikipedia”. The hesitating answers show that the pupils are used to question the process and the way the information is corrected and published on Wikipedia. “Sometimes, if it is a popular topic, you can trust that the information is often checked so that no one writes something that is not true. However, if there is not much information on the subject, Wikipedia may not be the best source” (example 17, survey 2019). The negative answers point out the instability of the editing process as anybody can change and modify the content of the articles. Consequently, there is a practical difficulty to quote these sources. “No I do not think so. Many people have access to Wikipedia and anyone can go in and add information. Hence, the source is not credible” (example 18, survey 2019). There is a consensus among the answers on the easiness to check facts and compare the information with other sources (Wikipedia is not a sufficient source), there is a reflection on the process of publication (the anonymous community that constantly checks, edits and updates the information) (Capiluppi 2012). Some answers recall the fact that Wikipedia is a non-profit organization which lives with readers’ donations to disseminate knowledge. On the one hand, pupils see the editing process as a proof of a non-reliable source whereas another group highlights the possibility of modifying the information. The most interesting aspect of the answers revealed what most pupils do. They consult the sources on Wikipedia but they seem to hesitate to use these sources in a potential academic text. In other words, they have an easy access to the source, they have learnt a discourse from school regarding the reliability of the sources and the difficulty to integrate them. They partly base their investigations on these sources but they are not sure if they would quote them. Even the positive answers share this kind of hesitation. It gives here a clear signal on how it is possible to work with freshmen on the principles of academic integrity.

The last question gave the possibility to secondary school pupils to reflect on the phenomenon of “fake news” by collecting ideas and tips to avoid the misuse of information. Figure 4 illustrates the recurrent notions associated with the answers: “source”, “information”, “primary”, “news”, “check”, “other” were the recurrent words. The pronoun “you” is used in this context to provide commentaries on potential actions that could be followed by other pupils to avoid a certain misconduct.

In this part, the pupils could provide recommendations and elaborate a strategy to fight against the spread of fake news. The common remark was about the necessity



**Fig. 4** What is the best way to fight against fake news? Source: Recurrent keywords in the answers of Swedish secondary students in 2019 and in 2020

of source criticism even if the open answers reveal a variety of expressions. “Do not believe what you read and form your own opinions before taking action or asserting something based on facts” (example 19, survey 2019). Other answers underlined the notion of “primary sources” to avoid a biased view on specific sources. One piece of advice even described a methodological path: “1. Pin the webpage 2. Write against/explain why it is fake 3. Find primary sources” (example 20, survey 2019). The answer comments the visualization of the source (“pin the webpage”) and invites other pupils to detect the fake content. The practical action (“pin the webpage”) comes back in other comments as well, they give a concrete detail on how pupils proceed when they are on the internet. There were answers that encouraged pupils to report the sites that had a tendency to spread fake news.

A distinction between “fake news” and “established sources” was made in different answers to consecrate the access to primary sources. It shows a consciousness of the gap between Wikipedia and scholarly sources (Arnett & Forrestal 2012, p. 181; Bendixen et al. 2022, p. 28). In some cases, the explanation was more complete: “you should refer to sources where you know who wrote the text and when the text is written” (example 21, 2020). This is a contrastive answer to the former question on Wikipedia as many respondents found it difficult to identify the source when it was written by anonymous writers. “Question the ‘probability’ of the news. Does it seem right? Make sure that the questions ‘How’, ‘Who?’, ‘What?’ are answered and that it is possible to contextualize them” (example 22, 2020). Last but not least, some recommendations could even emphasize the critical investigation of sources by questioning what is said. “Do not have faith in authority, things are not true just because teachers, politicians, websites say so if the sources are not correctly reported” (example 23, 2020). In addition to this, the recommendations were pragmatic as the respondents could encourage their classmates not to share information which is not checked (the quote “check the writer” comes back often). One comment gave an insight on how fake news could be spread: “it should not be a testimony but a real event” (example 24, 2020). This pupil points out here the danger to base an investigation on the feelings of others.

## Discussion

The consideration of Wikipedia as a support for most of the tasks can be a potential source of plagiarism as pupils might feel that they have to rephrase some texts extracted from Wikipedia. Other studies showed that secondary school students always look for a form of “inspiration” (Skaar et al., 2013, p. 29). Secondary school pupils associate Wikipedia with a good start before testing the credibility of the source (Rowley & Johnson 2013, p. 4) even if they notice what Rosenzweig noted: “writing about *Wikipedia* is maddeningly difficult. Because *Wikipedia* is subject to constant change, much that I write about *Wikipedia* could be untrue by the time you read this” (Rosenzweig 2006, p. 119). This finding corroborates other results made on college students who test the credibility of Wikipedia sources (Lim 2013, p. 412). In this perspective, the behaviors of upper secondary school pupils and college students are similar.

The results show that there is a need to work on the expectations of studies at the University in order to engage presumptive students with the notions of academic integrity. In the Swedish context, many upper school pupils often choose to take a sabbatical year when they are done with their studies, which may explain why they do not necessarily connect university with the notions of academic integrity (Blum 2016, p. 385). In this regard, this is similar to what Mariya Chankova observed in Bulgaria when she recorded the experience of freshmen students. (Chankova 2020, p. 161). Source criticism was an easy input to explain how a scientific investigation is conceived. It could be added to the “assemblage” of tools that are needed to be presented on academic integrity to freshmen (Vasilopoulos, Bangou, 2022, p. 11). There is a discourse on source criticism in upper secondary schools in Sweden which is quite well-known by upper secondary pupils (Tallerås & Sköld 2020). The discussion on sources with the help of videos has concrete consequences on how to develop strategies that can avoid the risk of plagiarism.

Last but not least, the action research could reveal that some of the pupils had an awareness of what fake news were and how they could generate a resistance to knowledge (Rowley & Johnson 2013; Wikforss 2017). They also point out the relation between social media and fake news, this is why sources should be found in other platforms. The study shows that secondary school teachers still have possibilities to train the information and digital literacy of their students (Sureda-Negre et al. 2015, p. 106).

## Conclusion

The result of the action research is that most pupils are aware of the principles of source criticism. They know what a reliable source is but they would need to have presentations and discussions that question their ways of searching information. Furthermore, most of them are critical when it comes to the use of sources even if in many cases they are tempted to privilege a quick access to sources. It is why a presentation on academic integrity is needed to point out the bad habits that could potentially lead to problems of plagiarism (Premat et al. 2022). The action research was not only a method to collect metadata and information on the secondary school pupils’ learning strategies, it had a pragmatic intention that made the pupils aware of problematic study habits (Pecorari 2015; Weber-Wulff 2015, p. 104). Future research has to be made on the upper secondary pupils’ perceptions on their study techniques

regarding source criticism. They are aware of a general discourse on source criticism but find it difficult to reflect on patchwriting strategies which is also the case in other studies on student plagiarism (Kalin 2015; Kasler et al. 2021). Regarding Wikipedia, the result was all the more interesting as it indicates a contrast between what the pupils do (Wikipedia is used by all the respondents) and the hesitation to quote a Wikipedia content. This dissonance has to be deepened as it can lead to plagiarism practices when pupils (and later on students) extract second-hand information from these sources without citing anything. The secondary school pupils know how Wikipedia works with a community of anonymous writers and referees who constantly check and update the articles (Lee & Seo 2016, p. 4). The problem is that Wikipedia replaces textbooks and there is a risk that pupils tend to plagiarize these contents, which is often referred to as “Wiki-plagiarism” in the scientific literature (Laurent 2020, p. 402; Bendixen et al. 2022, p. 29). If academic integrity was understood by the upper secondary pupils, the risk of patchwriting strategies needs to be questioned to prepare them for academic writing (Power 2009). It shows how educators, faculty members and teachers can cooperate and adjust their presentations of academic integrity teachers, students and academic writing centres can cooperate at an early stage to make students work on their academic integrity (Vandehey et al. 2007; Gul-lifer & Tyson 2014; Bretag 2016; Richards et al. 2016).

The presentations of academic integrity and source criticism to an audience of upper secondary school pupils are relevant as they activate the capacity of reasoning around the sources of information that they have access to. These presentations can facilitate a boundary between the pupils’ world and the expectations of university teachers.

#### Abbreviations

GDPR	General Data Protection Regulation. This is the European regulation on data protection which was adopted in the European Union in 2016 and implemented in the member States in 2018
NE	National Encyclopedia in Sweden. This abbreviation refers to the website of the Swedish National Encyclopedia where it is possible to find information, articles and movies related to any kind of topic which has a relevance for students ( <a href="https://www.ne.se/">https://www.ne.se/</a> )
RMIT	University: specific name for a “global university of technology, design and enterprise” ( <a href="https://www.rmit.edu.au/">https://www.rmit.edu.au/</a> )
SO	abbreviation for social sciences in Swedish (Samhällsorienterade ämnen). In the article, the abbreviation is used for the resources that can be found on the website <a href="https://www.so-rummet.se/">https://www.so-rummet.se/</a>
SVT	abbreviation for the Swedish Television funded by the State (Sveriges Television, <a href="https://www.svt.se/">https://www.svt.se/</a> )

#### Acknowledgements

The author would like to thank the Centre for the Advancement of University Teaching of Stockholm University and especially Jonas Collin, media pedagogue at Stockholm University who was in charge of the video production.

#### Authors’ contributions

The author has been involved in *Aktuell högskolepedagogisk forskning* (2020–2022) with the redaction of several critical rections on academic integrity, <https://www.su.se/ceul/forskning/aktuell-h%C3%B6gskolepedagogisk-forskning/vi-beh%C3%B6ver-fler-insatser-f%C3%B6r-att-st%C3%B6dja-akademisk-integritet-1.637891>. Different presentations have been made on plagiarism in Sweden. Premat, C. (2020). Plagiarism issues in Swedish universities. Stockholm University. Conference contribution. <https://doi.org/10.17045/sthlmuni.13109417.v1>. Premat, Christophe (2020). Hur kan vi undvika att våra studenter plagierar Wikipedia?. Stockholm University. Presentation. <https://doi.org/10.17045/sthlmuni.12000096.v1>. Premat, C. (2020). Deepening source criticism in higher education to avoid plagiarism. Stockholm University. Conference contribution. <https://doi.org/10.17045/sthlmuni.13067432.v1>. Premat, C. (2019). Quick facts and plagiarism in higher education. Stockholm University. Educational resource. <https://doi.org/10.17045/sthlmuni.9944180.v1>. Premat, C. (2019). Hur kan man lära studenter att undvika plagiering?. Stockholm University. Preprint. <https://doi.org/10.17045/sthlmuni.7850993.v2>. The author(s) read and approved the final manuscript.

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### Funding

Open access funding provided by Stockholm University. There was no other direct funding outside the time devoted to the project for the Centre for the Advancement of University Teaching of Stockholm University.

### Availability of data and materials

The data of the surveys were deposited on the following repository:

Premat, C (2022). Anonyma data från två undersökningar av svenska gymnasieelevers attityder till källhantering (2019 och 2020). Stockholm University. Dataset. <https://doi.org/10.17045/sthlmuni.21688262.v1>

The movie "Plagiat, fake news och källkritik" (Plagiarism, fake news and source criticism) is available on <https://www.youtube.com/watch?v=pCd0oAJlxyl>

A design pattern on academic integrity has also been created by the author in 2022. Premat, C., Fagerlind, C., Collin, J. (2022). Att presentera akademisk integritet. Stockholm University Design Patterns. Presentation. <https://doi.org/10.17045/sthlmuni.19746493.v1>

### Declarations

#### Competing interests

The author has no competing interests to declare.

Received: 2 May 2022 Accepted: 24 February 2023

Published online: 20 March 2023

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Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

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