With or without Wikipedia? Integrating Wikipedia into the Teaching Process in Estonian General Education Schools

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Abstract: Today’s education has been shaped by the rapid development of digital technologies and easy accessibility to a large number of electronic sources. This has instigated a genuine need to change current teaching attitudes and practices. Wikipedia, as a multilingual online platform open to all, is a source of information that is used on a daily basis and therefore cannot be ignored in the teaching process. The aim of this study is to explore the possibilities of using the Estonian Wikipedia for teaching purposes in general education schools. The study is based on semi-structured interviews with 49 teachers from 11 general education schools in Estonia. The results of the qualitative content analysis of the interviews indicate that teachers consider the use of Wikipedia to be a suitable for teaching, alongside other information sources and environments. However, teachers acknowledge some uncertainty and caution towards Wikipedia, as they do not consider it a very reliable teaching tool: an attitude largely inherited from the early days of Wikipedia. While teachers themselves are active and frequent Wikipedia users, and allow students to search for information, they do not assign Wikipedia-based text-creation tasks to students. The results of this study provide a basis for discussion about integrating Wikipedia into teaching in a way that is accessible, engaging, and inclusive for students.

Keywords: 21st century skills; information literacy; source evaluation; digital pedagogics; Wikipedia in schools

1. Introduction

Wikipedia is an online encyclopaedia, a multilingual online environment for knowledge creation and dissemination built on a wiki-platform [1]. Due to its global openness and free access, it has been considered an inclusive and democratic educational platform [2] but also has been referred to as a new regime of power in the mediation of academic knowledge and the imposition of mental models [3]. Reflecting and amplifying cultural hegemony [4], Wikipedia can be envisioned as a global repository of human knowledge [5], somewhat reminiscent of the library of Babel in Jorge Luis Borges’ 1941 novel of the same title. This library, with an immeasurable perimeter and no centre can be understood as a metaphor of the universe as an ever-growing digital repository of knowledge. Wikipedia’s ambition to provide a vast amount of rapidly accessible information that is authentic and prestigious, but also clearly structured, has been both applauded and criticised in the field of pedagogy.

Over the last few decades, education has been strongly influenced by the rapid growth of digital technologies. This has given impetus to digital pedagogy, which specifically deals with how digital tools can be used meaningfully, and in various ways, in the teaching and learning process. The leap that has resulted from this technological involvement has made electronic information sources and learning materials easily accessible to all those involved in the teaching and learning process, requiring them to have the information and digital
literacy skills that are becoming the foundation of contemporary education. E-learning, in any discipline or format, which involves various digital sources, including Wikipedia, has transformed the role of the teacher in many important aspects [6]. The widespread use of Wikipedia as a universal tool for learning and research in secondary and higher education has laid the foundations for a Wikipedia-based pedagogy with its own specific challenges [7,8]. Covering a wide range of pedagogical practices and educational concepts, Wikipedia has been used in teaching a range of 21st century skills, including critical reading, academic research and writing, but also in participation and collaboration.

1.1. Teachers’ Critical Attitudes towards Wikipedia

The attitudes of the research and education communities towards Wikipedia reflect a number of common critical arguments, as well as frequent misconceptions, repeatedly raised in general discussions [9,10]. In many research articles, a key problem with Wikipedia-based pedagogy is said to be based on teachers’ negative perceptions. In what follows, we summarise some of the most prominent ones.

Since everyone can create Wikipedia content, it means that knowledge is produced as the “wisdom of the crowds” [11], in the form of large-scale collaborations that are dispersed in time and space [12]. The principle whereby anyone can edit the content of a site in a web browser, that is, add and remove information, as well as look up earlier versions of an article “sounds like a recipe for disaster” [9]. Academic credibility is further undermined by the fact that it is not only certified experts but also thousands of anonymous non-experts, who produce Wikipedia articles [13], which does not comply with the usual principles of authorship in Western academia [14,15]. When evaluating the impact of Wikipedia on their students’ research, teachers often express concerns that Wikipedia is being used as an anonymous information repository rather than as a springboard for more academic research sites [16].

The above concerns are related to another frequent claim, that Wikipedia is not an unequivocally reliable information environment. A general distrust of Wikipedia is fuelled by the perception that a collaborative encyclopaedia cannot meet rigorous quality standards [2] or impose a monopoly on knowledge [17]. Indeed, Wikipedia’s content is usually produced by volunteers whose competence has never been verified. Many teachers feel that Wikipedia is an unreliable site because it legitimises the constantly changing but also manipulable content, which, in the worst case, can be biased or outright false [10,18]. In many cases, problems also arise with the lack of controllable sources [16]. It may well be that this academic reluctance to accept Wikipedia stems from teachers’ ignorance or a lack of pedagogical perspective, rather than from the fact that Wikipedia is a fundamentally inappropriate teaching tool and research source [9] that should be banned in schools.

Having a broad anonymous author community necessarily leads to the variable quality of Wikipedia articles. Indeed, due to open access and democratic work principles, Wikipedia is open to contributions from writers of varying levels of expertise [19], which leads to the uneven quality of Wikipedia articles. Since there is no prior peer-review mechanism in place, users may indeed find articles “in a bad state”, incomplete, unsourced, or recently vandalised [5]. Inevitably, some articles remain out of date because there are not enough volunteer writers and editors—dedicated Wikipedians—yet updating Wikipedia is considerably easier and cheaper than updating printed materials. While in the past teachers’ and researchers’ scepticism about Wikipedia was often justified [3], over time the perceived quality of Wikipedia has somewhat improved, especially among researchers [20,21], but teachers also see its increasing pedagogical potential [10,22].

Wikipedia is not an original source that generates new information, but a referential summary, densely packed with information, of existing secondary sources that can be verified. Nonetheless, learners in academic research use Wikipedia as a primary source, the authority of which they generally do not question [23]. As a patronising information environment with high visibility in Google search engine results, Wikipedia negates the need to search for alternative sources alongside it. From a pedagogical perspective, there is
no point in telling learners to avoid Wikipedia [24]. Rather, we should raise their awareness of the educational potential of the site and the responsible use of it [25–27]. Wikipedia undoubtedly has its value in academic research, but primarily as a research tool, not as a source to be used unchecked [9] or as one’s own work [28].

In addition, teachers have observed that Wikipedia has under-represented areas and imbalanced content. A lack of systems in Wikipedia has been accused of responsibility for marginalising certain sociocultural topics and under-representing gender and race issues [22]. This also includes an unbalanced presentation of sensitive and controversial topics [29] and, in some cases, the spread of systemic biases and misconceptions [8,12], but at the same time, Wikipedia has been observed to possess a unique ability to protect itself from problematic information and ensure the validity and verifiability of the information [30]. Wikipedia’s information policy has been considered as uneven and its impartiality has even been questioned at times [31] (p. 271). If Wikipedia aspires to be a truly global and multifaceted resource that brings together the sum of human knowledge [32], it must find ways to more effectively mediate regional knowledge practices [12] as well as overcome challenges in teaching sensitive and controversial topics [33]. This is the direction the Wikimedia Foundation has taken in its 2030 strategy [34].

In less direct ways, teachers fear of Wikipedia may be related to their own lack of digital literacy. Previous studies confirm that a digital schism between students and their teachers can be observed in universities [35]. This confirms the problem that academic personnel are not adapted to the opportunities offered by new technologies, while students have a greater motivation and a natural willingness, which is reflected in their skills. The same can be said of teachers in general education schools, who sometimes feel like digital immigrants [36].

Thus, while earlier, more radical criticisms by teachers and researchers see Wikipedia as a barbarian attacking the ivory tower of academia [1], more moderate reproaches and discreet doubts are tempered by the desire of many teachers to learn more about Wikipedia as a tool of modern pedagogy. A number of studies (e.g., [10]) reveal gaps in teachers’ Wikipedia knowledge and demonstrate the underuse of this resource in teaching and learning.

1.2. The Potential of Wikipedia-Based Pedagogy

While the above criticisms do reflect the sceptical attitudes of many researchers and teachers towards Wikipedia, numerous studies confirm its growing pedagogical value as a teaching tool [37]. Research clearly suggests that the key to a successful use of Wikipedia lies in an innovative approach, rather than restricting its use [16]. Therefore, publications often discuss how Wikipedia can be used to improve learner engagement in classroom and facilitate collaboration in study groups. It can support the development of academic literacy and shape research skills, enhance information retrieval and improve critical reading skills. Additionally, it provides an active and meaningful learning experience and offers learning opportunities. As a useful active learning tool, Wikipedia requires a purposeful approach from the teacher when integrating Wikipedia-based tasks into the learning process [38].

The ways in which Wikipedia can be used in the learning process are nowadays seen in a much broader way than in the past [39], linking it to transferable skills in the 21st century learning concept that supports learning skills that are part of academic literacy.

1. Digital literacy. Wikipedia, as a digital platform, enables learners to acquire word processing skills, to participate in the process of collaborative writing, i.e., digital content creation, and in the interactive activities of an online community [38]. Furthermore, digital literacy is linked to an awareness of digital identity, data protection, and copyright. Digital literacy is an indispensable skill in the current and future world for fully exploiting the potential of Wikipedia and for managing it securely and reliably [36] (p. 116), and its positive impact on learning outcomes has been repeatedly demonstrated [40].

2. Information literacy. Wikipedia, as an interactive learning tool, enables the teaching of information literacy skills [8,11,30,41], which include searching for sources, as well as critically evaluating and interpreting them adequately. More broadly, it helps with navi-
gating the media space [29]. Wikipedia articles allow the evaluation of the usefulness and reliability of sources, the comparison of different sources, the analysis of their assumptions and context, the search for additional information, and the formatting of references and bibliography [42].

3. Research and analysis skills. Writing an article for Wikipedia mimics the real-world research process: first, one chooses a topic, and then one identifies a knowledge gap, drafts a proposal, conducts research, completes the text, and publishes it in its final form [43]. This kind of task improves research writing skills and helps the learner to feel like a real researcher, working through authoritative sources, processing existing knowledge and writing for a real audience [5].

4. Writing skills. Wikipedia enables learners to increase their awareness of the encyclopaedia article as a genre and to develop their writing skills through the process of completing and writing articles [37,44,45]. Writing for Wikipedia is an effective academic exercise that requires reviewing sources, synthesising knowledge, proper citation, and clear and accurate expression [13]. A wiki-assignment can also be used to draw learners’ attention to the creation of a complete text, paragraph structure, sentence structure and word choice, as well as to issues of orthography.

5. Cooperation skills. The collaborative nature of Wikipedia tasks and their orientation towards the public community speaks to the ability of this type of pedagogy to generate creative awareness and public participation in writing [46] (p. 390). Wikipedia represents a community-engaged pedagogy [30] that allows for increased civic engagement, as well as a sense of responsibility and motivation to learn, and academic and extra-academic engagement [22].

There are several reasons for integrating Wikipedia into teaching. In addition to outcome-based motivations, which include the learning skills included in the aforementioned academic literacy, Xing and Vetter distinguish between two other types of motivations in the context of university teaching. The first type are social equity motivations, which focus the attention of writers and editors on marginalised topics and under-represented content. The second type are interactive motivations, which value Wikipedia as a social environment where community collaboration can take place to generate public information and validate feedback [22]. Wikipedia has the potential to promote active learning, foster a sense of responsibility towards knowledge, and improve the awareness of the digital generation regarding critical contemporary topics, ranging from misinformation and fake news to biases, knowledge gaps, and knowledge equity [47]. It is the desire to help students develop skills related to research work and to provide them with an authentic opportunity to contribute to the public information space that is considered important by Estonian lecturers, who have integrated writing assignments based on the Estonian Wikipedia into their teaching [48].

Many discussions will lead to suggestions on how to use Wikipedia more effectively in teaching. In order to create a positive predisposition, it is recommended that teachers introduce students to the tools and guidelines of Wikipedia [26], as well as holding in-depth discussions with students about the roles of readers and writers in the digital environments [5]. Such collaborative debates help to raise learners’ awareness of Wikipedia’s resources, but also develop in them a meta-awareness of a range of ethical issues such as digital security or copyright. The range of tasks that can be integrated into the learning process should ideally be varied. For example, evaluating the accuracy and timeliness of the content of articles, adding content links and sources, paying attention to the versatile treatment of the topic and content gaps, summarising some research studies in the existing article, supplementing articles, suggesting topics for new articles, drafting one’s own article or translating it from a foreign language, editing the structure and language, and collaborating with an experienced Wikipedian [8,26,45]. In all of this, it is up to teachers to design school policies that foster positive attitudes towards Wikipedia, but which also regulate the practices and requirements for Wikipedia use that teachers and students alike must follow [11,16].
1.3. Estonian Educational Context

Estonia’s national school system provides a compulsory general basic education (grades 1–9) and a voluntary upper secondary education (grades 10–12). Based on the national curriculum, it is up to schools and teachers to determine the teaching materials and methods to be used to achieve the compulsory learning outcomes. At the end of the basic education, in addition to compulsory examinations, students are required to produce a piece of creative work. At the end of the upper secondary education, they are required to produce some research or practical work, which requires, among other things, the ability to search for and critically evaluate information, to read and refer to different texts, and to produce an academic text.

Estonia’s national curriculum defines eight general competencies to be developed in all subjects. One of the objectives of communication competence is the production of different texts, and in order to achieve digital competence students must, among other things, create digital content and interact in different digital environments [49]. In order to teach effective communication in today’s world, reading and writing need to be seen as socio-cultural phenomena [50]. Shaping new kinds of literacies requires adapting to societal changes and providing meaningful learning experiences [51]. It also includes multimodal practices, the use of authentic texts, dialogic feedback and collaborative writing, digital content creation and its interactive sharing, publishing, etc. [52]. However, it is considered a problem that the majority of teachers in Estonia, whose average age is relatively high (49.2 years), teach from old habits of mind in a subject-centred way, and use cognitively simpler tasks in their teaching activities. Very little use is made of learning activities and long-term projects (including collaborative ones) that support students’ cognitive development and thinking [53]. Similarly, students create very little educational content using digital tools and do not share it interactively, as their digital activities are predominantly related to communication and web browsing [54].

Between 2014 and 2020, Estonia’s education system underwent a digital shift, which focused on the development of students’ and teachers’ digital competencies and the introduction of the principles of a new learning approach. That led to the creation and use of various e-tools: e-learning environments, e-books, e-tasks, e-exams, e-learning days, etc. From 2020 onwards, general education schools will be able, if they so wish, to base their teaching exclusively on e-learning materials. For the period 2021–2035, the development of digital pedagogy in education is the main target [55]. It is known that 95% of teachers in general education schools say they use some form of digital solutions in their teaching [56]. However, only 52% of teachers who have graduated in the last five years rate their preparation for using ICT to teach their subject as good or very good [53]. Survey data also show that students are passive in their use of digital devices for educational purposes, and use digital devices more at home than at school, i.e., teachers are more likely to leave assignments using digital tools for homework [54]. The development of digital literacy among students and teachers remains a national priority, and Estonian schools have the technical readiness and access to ICT tools.

In view of the above, there is a great potential for Estonian schools to use Wikipedia for educational purposes, but there is a lack of research-based data on its implementation. Unfortunately, only the development of university students’ academic literacy through writing Wikipedia articles has been addressed [48]. However, it is particularly important to study the relationship between general education schools and Wikipedia as a collaborative online environment, since the school, led by teachers, shapes students’ future attitudes towards Wikipedia. As Wikipedia is often one of the first sources to appear in online searches, it can be assumed that teachers have used it in one way or another in their teaching. The aim of the article is to explore the possibilities of using the Estonian Wikipedia for teaching purposes in general education schools. In order to achieve this goal, we seek answers to the following research questions:

1. What are teachers’ experiences of using Wikipedia outside the classroom?
2. What are the teachers’ perceptions of why and how students use Wikipedia in school?
3. How have teachers integrated Wikipedia into their teaching?
4. What factors do teachers say support or hinder the integration of Wikipedia into their teaching?

2. Materials and Methods

2.1. Sample

In the study, teachers from general education schools in various different regions of Estonia were invited to participate. The inclusion of schools in the study was based on the principles of purposive sampling, according to which the sample consists of the participants best suited to the purpose of the study, through whom information-rich cases can be opened up (see [57] (pp. 96–99)). Thus, we proposed for participation in the study only those schools where we knew that Wikipedia had been used in teaching, e.g., they had previously participated in article competitions, organised workshops, or given Wikipedia-related classroom assignments. In total, we approached 20 schools across Estonia during the design phase of the study, 11 of which agreed to participate. The contact for the schools that gave their consent included 3–5 colleagues who had used Wikipedia for educational purposes.

The 11 focus group interviews involved 49 native Estonian-speaking teachers, 38 of whom were women and 11 men. A total of 14 teachers worked in basic schools, 18 in upper secondary schools, and 17 in both basic and upper secondary schools. There were teachers of 21 subjects, representing all the subject areas stated in the national curricula. The most represented subjects were Estonian language (17), literature (16), history (8), English (7), basics of research (5), nature (4), social studies (4) and geography (3). The remaining subjects were taught by 1 or 2 teachers. A third of teachers taught up to 4 subjects at a time, a situation which was more common in smaller schools, or held other posts in addition to teaching, e.g., as a development manager, librarian, or educational technologist. The average length of service of the interviewees was 16 years (min 0.4, max 43).

2.2. Data Collection and Analysis

We collected the data via focus group interviews, which allow, thanks to the interaction between participants, for a greater amount and variety of material on the topic in hand (see [58] (pp. 695–700)). The interview schedule consisted of three parts, the first one covering the general use of Wikipedia, the second the use of Wikipedia in teaching on the initiative of the students, and the third the use of Wikipedia in teaching on the initiative of the teacher. Each thematic block included two main questions (open-ended questions, e.g., Please describe what you use Wikipedia for and how often; To what extent do students use Wikipedia for creative/research work?), but the sub-questions were varied, according to the interaction situation, as the semi-structured interview structure allows (see [57] (pp. 110–111)). At the end of the third part, we provided teachers with a written list of sample tasks on Wikipedia to support the discussion.

The pilot interview took place in November 2022, but as there was no need to make any changes to the interview schedule based on this, we included the pilot interview data in the study. The remaining interviews were conducted between December 2022 and February 2023. All interviews took place on-site at the schools at a time convenient to the participants. At the beginning of the interviews, the interviewers and participating teachers introduced themselves; the interviewers provided an overview of the objectives and organisation of the study, and asked them to fill in a consent form and a background information questionnaire. They were then introduced to the interview structure and asked for permission to record the interview. Interviews lasted on average 56 min (min 42, max 67 min). All interviews were conducted by two interviewers, one of whom was always either the first or second author of the article, to ensure that the interviews were conducted uniformly.

For transcribing the interviews, we used an online speech recognition tool [59], while we manually corrected the automatic transcriptions based on the recordings. The total
The length of the transcribed text was 262 standard pages (min 16, max 29, average 24 pages). During the transcription process, we replaced the names of all participants with codes (Teacher 1 = T1, etc.), and removed all other identifying information mentioned during the interviews, to ensure the anonymity of the participants.

The collected data were analysed according to the principles of qualitative content analysis, using the freeware web application QCAmap (www.qcamap.org, accessed on 22 March 2023). At the beginning, the first and second authors of the article read the transcripts of the interviews several times in order to obtain an overview of the data set. In the vertical analysis phase, the first author of the article coded all interviews inductively, based on the research questions, and then aligned the use of codes and names. In order to increase the reliability of the analysis, the second author of the article, in the horizontal analysis phase, co-coded the entire data set according to the research questions, building on the coding markers of the vertical analysis. Based on the resulting codes, categories representing thematically related larger units of meaning emerged from consensus discussions. For example, for the research question For what reasons and in what ways do teachers perceive that students use Wikipedia in their learning on their own initiative? four categories emerged: written non-referential tasks (codes: discussion, essay, classwork, independent work), written referential tasks (codes: report, creative work, research), oral tasks (codes: speech, presentation) and finding additional material (code: the same name).

The results of the research will be presented according to the themes of the research questions. The information provided in the chapters is based on the categories and codes that emerged from the data analysis. The statements are illustrated by interview transcripts, which we have been lightly edited, e.g., by removing features specific to oral language. Longer quotations are in separate blocks, shorter ones in italics within the text. Words, phrases or sentences omitted from longer quotations are indicated by /---/ and words or phrases added for clarity are indicated by [ ]. The codes next to the interview passages indicate schools (school 1 = S1, etc.).

3. Results

3.1. Teachers’ Experiences of Using Wikipedia Outside the Classroom

The focus group interviews show that teachers use Wikipedia outside of class mainly to find new information about unknown objects, such as people, films, literary works, and historical events, or to check facts. Most of the participants use the Estonian language version, but if it does not provide enough information, they turn to the English version, the big Wikipedia, although there are also some who prefer the English version or use both. In a few cases, the German, Finnish or Russian Wikipedia is used. Although there are some respondents who do not use Wikipedia for personal use (almost) at all, but do use it for work purposes, the majority of respondents still rate Wikipedia use as frequent or very frequent.

I think I probably use Wikipedia more than I realise, because when I start looking for something, it’s often the first source that comes up on the computer. (S1)

The overall ease of use of Wikipedia supports information seeking: Wikipedia offers a quick and convenient way to obtain initial information. The ease of access to information is facilitated by the fact that Wikipedia appears first in an online search, Wikipedia just pops up. The teachers interviewed also value the compendious nature and ease of understanding of the information presented on Wikipedia, which allows them to quickly familiarise themselves with the subject. One participant likened Wikipedia to a light meal, which, while not a substitute for a main meal, performs its function quickly and conveniently.

It seems to me that it really sums it up in a concise and popular way without going into detail. (S2)

Apart from the ease of use, the Wikipedia environment itself is an advantage in terms of information retrieval. For personal use, it is mainly the textual material that is used, the amount of which is generally considered sufficient. If the necessary information cannot be
found in the Estonian Wikipedia, other language versions are used. In the case of textual material, the logical and consistent structure of the articles is an argument in favour of Wikipedia as a source. The possibility of using internal links is specifically mentioned, but this can lead to the risk of getting lost in Wikipedia and finding additional material to read in the bibliography. Some individual teachers have also used audio files, but videos are more likely to be searched for on YouTube. However, the majority of teachers are not at all aware of Wikipedia’s audio and video materials, just as they are not familiar with Wikipedia’s sister projects, e.g., Wikibooks, Wikiquote and Commons.

*I have a bad habit—I understand that in the English media it is called the Wikipedia hole—of starting to check a fact and then finding yourself an hour and a half later somewhere reading about fusion dynamics, which you do not half understand.* (S10)

In addition to factors related to ease of use and the Wikipedia environment as such, teachers’ personal experience of using Wikipedia is influenced by the perceived quality of Wikipedia. Based on teachers’ experiences, this is related to their previous rigid and even prohibitive attitude towards Wikipedia, rather than their current experience of using it. Although some teachers consider that Wikipedia articles are full of errors, the overwhelming view is that there are some errors but that these are not so much factual as evaluative, and that they are mainly related to politicised topics. To verify the accuracy of the information, the trust-but-check principle is applied, i.e., the information on Wikipedia is compared with that on other sources, including Wikipedia in other languages. In doing so, it has been observed that paper sources are not always more reliable than online sources. Despite some inaccuracies, Wikipedia is perceived as a relatively reliable source, with a significant improvement in quality over the last decade. This is mainly seen as a result of the large readership that ensures quality control, as well as the efforts of the administrators in reviewing articles, including pointing out content problems in Section 4 and adding editorial notes to the article. Increased public awareness of Wikipedia has also contributed to this credibility.

*I think Wikipedia has got a lot better. I think maybe five years ago I was very cautious still, but maybe even more so years ago.* (S6)

In contrast to the information-seeking activities, only a very few teachers have experience of writing a Wikipedia article. None of them have done so voluntarily, but may have written it as a compulsory task as part of their university studies. The difficulties are not considered to be so much technical as rather their own insufficient knowledge of the content. Quite a few respondents have noted factual errors in Wikipedia articles, and in some cases errors of judgement, but only a few have corrected them. Only a couple of teachers have improved the article by adding text or images.

*It’s nice when you have a good grasp of the subject, but when it’s a more complex language topic , it’s not pleasant to write in such an insecure way, and all the more so to know that I might not be the only one who might have written a bit of nonsense.* (S5)

### 3.2. Use of Wikipedia as a Student-Initiated Learning Tool

According to teachers, students often use Wikipedia in their learning process, even when they have not received direct instructions from teachers. Wikipedia is a popular resource for classroom tasks that require searching for information (e.g., explanations of concepts and facts). Such use of Wikipedia is taken for granted by teachers, as Wikipedia is a handy resource which, moreover, usually appears at the top of the web search. Teachers also see it as a positive thing when students use Wikiquotes and Wikibooks, sister projects to Wikipedia, which teachers have become aware of through students.

*When we use [the computer] in class, I try to direct them to the databases, and when I ask where you got the answer from, he always says Wikipedia. And the answer is the same really.* (S6)
However, problems with the spontaneous use of Wikipedia arise with different types of independent work, which include oral presentations and speeches as well as written essays, papers and creative work. In most of the basic schools under review, the use of Wikipedia as a source is allowed, but students are expected to refer and cite correctly. The main problem has been copying text directly from a Wikipedia article without changing the wording or the formatting. However, this problem is not specific to Wikipedia, as the same applies to any other online source. On the one hand, and according to the teachers, this is due to the desire to make as little effort as possible, i.e., to take the first available source and the first available piece of text, without even making sure that it is relevant. On the other hand, the use of the cut-and-paste technique stems from the fact that the student does not understand what is being read and cannot therefore summarise it in his own words.

*What they usually do, is copy and paste, and then they forget the lines and things that immediately give a direct indication of where the text is taken from.* (S5)

Even more demanding is the compulsory research in upper secondary school (mostly in grade 11). In terms of demand, upper secondary schools are divided into two groups. There are schools where students are told that Wikipedia is a good source to start with if they need to obtain a quick and convenient initial overview of a topic, but that Wikipedia articles must not be referenced or cited in the research. Instead, they should look at the list of references at the end of the Wikipedia article and use it to find the original sources. On the other hand, a second group of upper secondary schools consider that there is no point in avoiding Wikipedia as a source, as the use of Wikipedia is in some ways an inevitability, but that it is important to teach students how to properly cite and refer to a Wikipedia article. In these schools, the problem is seen more as a tendency for students to limit themselves to Wikipedia without bothering to look for other sources.

*It [the Wikipedia article] is referenced from something else. Then the question is whether he can refer to Wikipedia in it [in the research paper] or whether he has to refer to the source where the information came from to Wikipedia.* (S7)

*My experience says that they would really like to use Wikipedia, both English and Estonian, because it’s really a good source actually, it’s all there. But yeah, I’ve been stressing the point that you need to have different sources.* (S2)

Although differences in attitudes towards Wikipedia can be seen between basic and upper secondary schools, there were also some schools whose teachers did not agree on whether Wikipedia could be used as a source or not. These differences of opinion also pointed in some cases to a lack of common agreement at the school as a whole.

### 3.3. Use of Wikipedia as a Teacher-Initiated Learning Tool

Teachers have integrated Wikipedia into their teaching predominantly in three main ways: by using it to prepare and deliver lessons; by giving students a variety of Wikipedia-based tasks; and by directing them to participate in Wikipedia-related extra-curricular activities. Despite the fact that some of the teachers are so called book-believers, they still use Wikipedia from time to time to prepare lessons and homework, to obtain an overview of a topic, or to search and check facts. Further information is also obtained from the list of references at the end of the articles. In addition to definitions and other textual material, images, drawings, maps, chemical equations, signatures of people, audio files, etc. are taken from Wikipedia to enrich their slide presentations. The main reason for choosing Wikipedia is that it is quick and easy to access information, without having to search for it from the bottomless pit of Google. Convenience also includes the issue of copyright: Wikipedia is known as a source where the use of all material is free, as long as it is properly referenced. However, in a couple of interviews, teachers admitted that they do not follow the citation and referencing requirements for Wikipedia, jokingly hoping that *this is forgivable for educational purposes.*
As a history teacher, you don’t always have the time or the energy, or the books at home, to quickly read up on a subject or check the facts. That’s pretty much what I do with this [Wikipedia]: pull up the article and have a quick look. (S10)

I also use a lot of the material there for slide presentations, so I copy-paste and use a picture. (S7)

Teachers also turn to Wikipedia for information during lessons when they or the students have a question on the go. Some search Wikipedia in front of the students, others do it on their own, using a laptop or phone. If there are students with different mother tongues in the class, teachers also value the possibility of using different language versions of Wikipedia—in this case Wikipedia acts as a dictionary.

I’ve also shown articles on the wall, because I need to normalise somehow that I can’t know everything and that’s okay. /---/ The student also understands that he doesn’t need to know everything. He/she needs to know how to use these resources. (S10)

In class, teachers have given students discussion-based tasks. As can be seen from the previous example, these include looking at an article together, with the aim of finding answers to questions of interest, but also looking at some of the articles in more detail. In some cases, the collaborative viewing has been extended to the Wikipedia environment, e.g., exploring how many language versions of Wikipedia there are, and how many articles are on Estonian Wikipedia (Vikipeedia), which is Wikipedia’s sister project. As some teachers consider this kind of review to be more suitable for the younger grades, it is mostly limited to discussions about the strengths and weaknesses of Wikipedia, in order to increase students’ critical awareness of sources. Students have also been allowed to compare the information on Wikipedia with other sources, including paper sources.

In class, when we talk about sources and source evaluation, Wikipedia is one of those larger chunks where we discuss what makes it reliable, what makes it unreliable, why it’s not a valid source in the context of research. (S8)

The second group of tasks relates to the consumption of information from Wikipedia. This group consists, in particular, of class assignments in which questions have to be answered or gaps in the worksheet filled in using different sources, including Wikipedia if so desired. According to Estonian teachers, some of the textbooks and workbooks also included tasks specifically on Wikipedia. In addition to the in-class assignments, teachers have offered students homework tasks related to Wikipedia, and have also suggested that they start their research by reading a Wikipedia article on the subject.

I find the range of proverbs and sayings on Wikipedia very good and I have given the homework task to choose a proverb and explain it or talk about your own life. (S10)

The third group of tasks, the least represented in the interviews, requires students to create content for Wikipedia. Only a few teachers have had students write an individual Wikipedia article, and just as few have experimented with writing an article together (e.g., about their school). At the same time, some teachers admit that they do dry runs with their students, i.e., they write the article but do not put it on Wikipedia because they do not dare to take responsibility for the quality. Translation has also been experimented with. However, some teachers have worked with students to add to articles on Wikipedia or to improve the language of articles.

I have also done some collaborative writing, but we haven’t just put it up. Somebody writes, adds something, I look it up, you look it up /---/. Most of the kids like this collaboration more /---/, the very few who want to do it all by themselves. (S11)

In order to support students’ content creation, teachers have commissioned Wikipedia workshops in school from the university or Wikimedia Estonia and organised project days. Under the teachers’ guidance, students have also participated in the National Mother Tongue Olympiad, and taken part in various public competitions, e.g., the 24 h and 36 h student article competitions, the competition for the 100th anniversary of the Republic of
Estonia. Although teachers say that not all students are capable of taking part in these competitions, the students who took part gained a wealth of new knowledge and skills that could be put to good use when writing their research papers. In addition, the cash prizes boosted students’ external motivation.

*A lot of people got just the kind of experience they needed for their research. After all, you could only use reliable sources and the way I formulate, the way I structure, is a very important experience.* (S8)

Many of the teachers interviewed said that they had so far limited themselves mainly to discussion-based tasks, but the interviews gave some ideas on how Wikipedia could be integrated more into teaching in the future.

### 3.4. Enabling and Disabling Factors for the Educational Use of Wikipedia

The factors that facilitate or hinder the educational use of Wikipedia are divided into five categories: factors related to Wikipedia as an environment, factors related to the knowledge, skills and attitudes of students, factors related to the knowledge, skills and attitudes of teachers, and factors related to the school and external factors.

The key factor related to Wikipedia as an environment is quality. Teachers perceive that Wikipedia has become increasingly trustworthy over the years, which is reflected inter alia in more accurate and up-to-date content, but they continue to question whether it is trustworthy enough to be used in teaching. Quality is important, as teachers note that Wikipedia is *the No 1 source* for students. As Wikipedia is a handy source (especially compared to paper encyclopaedias) and students are used to using it, this, according to some teachers, leads to a risk of *clinging on to Wikipedia*. Students tend to limit themselves mainly to Wikipedia, but teachers think that it is the diversity of sources that is important.

*Given what is being done with Wikipedia now, the same /---/ social awareness and attitudes have changed, maybe the image will improve and we can feed this idea to the students that you are part of this global information.* (S7)

*When they get to Wikipedia, it would still be good if it was not the only source for research. Just to have a more diverse thing.* (S2)

A factor related to students’ knowledge, skills and attitudes that has shaped teachers’ negative attitudes towards Wikipedia is students’ desire to get by as easily as possible, i.e., to use Wikipedia as the first source available. According to the teachers, this is due to students’ lack of information literacy and criticism of sources. Discussion-based exercises on Wikipedia are seen as one way of increasing students’ information literacy. Tasks that require content creation are perceived as unachievable for most students, due in particular to a lack of content knowledge and practical skills, but in discussions on writing, translating and revising Wikipedia articles, teachers expressed the view that tasks based on these activities allow students to develop reading, referencing, citing and writing skills, as well as collaborative and digital skills. By writing for the public via Wikipedia, some teachers felt that students’ interest in the task, and thus their willingness to work hard, could be increased.

*In Wikipedia, I don’t think a basic school pupil is yet competent to write articles or add to something. Knowing how much misinformation there is on Wikipedia still. Maybe some of them have. I wouldn’t take the responsibility.* (S5)

*Well at least it’s not just a job without any gain /---/ it’s going to the real world. It’s definitely more motivating than just doing an article for me about it.* (S2)

A key factor related to teachers’ knowledge, skills and attitudes is teachers’ general attitude towards Wikipedia. With a negative attitude, teachers are limited to discussion-based tasks (including presenting problems related to Wikipedia), while with a positive attitude they are willing to use more varied tasks. Teachers also admit that their ability to navigate and understand Wikipedia is poorer than that of their students. At the same
time, the use of content creation tasks and the provision of guidance to students for the competition requires teachers to have good knowledge of and skills related to Wikipedia. The lack of such skills places an additional burden on the teacher, as he/she has to familiarise him/herself in detail with Wikipedia as an environment, and the development of Wikipedia-based tasks is time-consuming for teachers.

I can’t imagine how to do this article, to edit there. Then I would have to figure it out for myself and then teach it to them. And then take into account that many people still don’t get it and I have to retell it. (S9)

Some of the school’s internal factors are related to the appropriateness of the tasks and subjects. There are some teachers who consider Wikipedia-based tasks as a good alternative to traditional tasks, which are particularly well suited to humanities and social studies subjects (e.g., Estonian language and history). In addition, according to teachers, the Wikipedia article task offers an opportunity for cross-curricular integration. Similarly, there are teachers who take the opposite view: Wikipedia should be included in the curriculum, but it is not possible to devote a lot of time to it, as there are more relevant tasks. Moreover, it is perceived that in some subjects, or even in some levels of education, Wikipedia-based tasks may not be suitable at all. Another part of the school’s internal factors is directly related to the use of Wikipedia as a resource for creative and research work. Here, teachers consider it important that there are clear agreements at school level on whether to allow the referencing and citing of Wikipedia articles. If Wikipedia is accepted as a source, guidance on its use could also be given in the school guidelines.

What distinguishes Estonian teachers from teachers in the rest of the world is that Estonian teachers make up assignments all the time. This, of course, makes us very creative, but it is tiring. In the end you just don’t get to /---/ you just like have to restrain yourself as a human being. We’d love it so much if people who have already thought of this assignment could have it. There could be some kind of online workbook. (S6)

In terms of extracurricular factors, teachers find it useful to be able to participate (also with students) in free training sessions and workshops on Wikipedia to learn more about writing a Wikipedia article. Teachers would also like to see comprehensive guidance materials (including video tutorials) and ready-made assignments, to save time and money. For students, the use of Wikipedia for educational purposes would be supported by various extra-curricular competitions, but a large proportion of teachers are not aware of public competitions. Even when information about competitions is sent to teachers’ emails, it is often lost in the information overload. However, those teachers who are aware of article competitions for students say that preparing students is a time-consuming task and that teachers’ input is often overlooked.

What I have noticed is that /---/ students are motivated, but teachers are often not. /---/
Often the problem is that it’s great that the student gets a thousand [euros], but in fact the teacher is often the one who does the most work there. How long will you live on this air of love and affection? (S4)

The factors that support or hinder the use of Wikipedia identified in the chapter depend, at least in part, on the teacher’s attitude towards Wikipedia, the possible Wikipedia-based assignments and the new approach to teaching. If teachers justify their non-use of Wikipedia-based assignments on the grounds that there are more necessary and useful tasks, this implies that they have an already-established way of teaching as a framework from which they do not want to deviate. Those teachers who found suitable tasks were inspired to discuss further how, at which age level, and with whom, they could be organised into their teaching.

4. Discussion

For more than twenty years, Wikipedia has evolved into a new paradigm for knowledge creation and dissemination [60] and one of the largest repositories for information
in the world [4], whose pedagogical potential is increasingly valued [37]. While several studies confirm the continuing reluctant attitude of teachers towards Wikipedia, which in extreme cases ends in a complete ban on Wikipedia use [5], the view that Wikipedia as a resource cannot be avoided is nowadays becoming predominant [9,16]. Instead, schools should find innovative ways to integrate Wikipedia into their teaching in order to increase students’ awareness of Wikipedia [6,8,29]. Therefore, the aim of this article was to identify ways to use Wikipedia in the classroom in general education schools, based on the experiences of teachers.

As confirmed by some previous studies [12,36], two general types of users can be distinguished on the basis of the interactions related to Wikipedia: consumers, who use the information contained in Wikipedia passively or actively, and producers, who write or translate new articles or add to or improve existing ones. Focus group interviews in Estonian schools revealed that a large proportion of teachers are active consumers, not producers, when using Wikipedia. They mainly use online encyclopaedias for personal reasons, to find new information and check facts, and—to a lesser extent—for professional purposes, to search for information during lessons, or to prepare lessons or assignments. Although the teachers say that they believe Wikipedia has improved in quality over the years, which has also increased their confidence in Wikipedia, they continue to view Wikipedia with a certain degree of caution, which places them in the role of critical consumers. In other words, teachers apply a critical awareness to the Wikipedia information they encounter in both personal and professional contexts.

Like teachers, students also play the role of consumers. They have taken on this role either by themselves, using the information on Wikipedia to do their homework, or through their teachers, who have given them tasks to search for information in class or at home from different sources, including Wikipedia, and then to assess its reliability. As students do not pay attention to the reliability of sources when consuming information independently, teachers integrate tasks that develop the ability to critically evaluate sources and information, in order to support their development into active consumers. While an earlier study in Estonia [53] showed that teachers often limit themselves to teaching only elementary information literacy and tasks that require specific factual knowledge and do not require higher-level cognitive skills, the current study confirms the desire of teachers to develop more versatile information literacy skills. The critical use of Wikipedia as a source for teaching is largely a teacher concern which it is sometimes difficult to make students aware of.

In general, teachers in Estonian schools consider Wikipedia to be an appropriate source for classroom tasks because it provides the information quickly and easily. However, there is disagreement about whether to allow the use of this website as a source to be referenced and cited, or to limit the use of Wikipedia to the possibility of using it to obtain a quick overview of the topic and to access additional sources. There are those who see Wikipedia as a source of complete and definitive knowledge, and those for whom Wikipedia is a starting point in the search for knowledge. Interviews with teachers in general education schools in Estonia revealed that, although Wikipedia is generally allowed to be used as a reference source in basic schools and not in upper secondary schools, there are also examples of the opposite. In addition, there are schools where there are no explicit agreements on the use of Wikipedia. Since, according to Estonian teachers, basic school students at least have clear difficulties in referring to and citing sources of any kind, consideration should be given as to whether Wikipedia should not be tolerated as a reference source in basic schools (including for creative work). Then, at secondary school (including for research), a more in-depth discussion could be pursued on why sources that are themselves referential should be avoided when referencing, and in which situations indirect citation should be used. It is also important for teachers to set an example for students when using text and images from Wikipedia; i.e., if they use texts and images from Wikipedia in their slide presentations, they should refer to them correctly.
The Estonian teachers’ study showed that few of them have made any changes to Wikipedia themselves, just as few have given their students content creation tasks that would offer the experience of writing for an authentic audience. Such a result is somewhat unexpected, as the teachers involved in the study had stated that they had addressed Wikipedia in their teaching, creating an expectation for a more diverse selection of tasks. According to the teachers, the main reason why students are not frequently given text creation tasks is the low level of knowledge and skills of the students. Moreover, they feel that publishing students’ articles on Wikipedia places a very high responsibility for quality on the teachers themselves. This is why in some schools students are allowed to write Wikipedia articles in order to learn about the genre, but the articles are not actually published on Wikipedia. While some of the Wikipedia-based assignments may indeed be difficult for students, there are also some that are more accessible. For example, students could take photos of places, objects and people in their local area, which would also allow them to address the issue of copyright, and include citations in Wikiquotes, thus learning about referencing. Upper secondary school students could write a Wikipedia article on a topic related to their research. The quality of the articles is important, and not only the authors (in this case teachers and students), but also the Wikipedia administrators and other contributors help to ensure this. Their role can be highlighted by reviewing the history of changes to the article with the students after the article has been posted. At present, Wikipedia’s potential as a collaborative environment remains untapped.

In addition to doubting their students’ ability to write or complete a Wikipedia article, teachers also acknowledge their own lack of readiness and preparation. Content creation tasks require a wide range of knowledge and skills about Wikipedia as an online environment, but teachers say that this is precisely what they lack, which is also why they do not understand how Wikipedia can be used more effectively in their teaching. A clearer understanding of the educational potential of Wikipedia would help both the teachers and their students to become better researchers and writers. Training, guides, examples, etc. are helpful, but as most teachers have not written an article on Wikipedia themselves, they lack first-hand experience of Wikipedia as a collaborative environment, which is seen as essential for a multifaceted approach to Wikipedia (see [1]). Teachers also cited their incompetence as a reason for not writing Wikipedia articles, as they felt that contributing to Wikipedia required a very good knowledge of the subject.

It is important to note that teachers point to a variety of obstacles related to the general organisation of the school. The main one emerging from the interviews is that teachers do not have the time to develop and implement Wikipedia-based tasks and that the small number of the lessons makes it difficult to integrate Wikipedia-based content creation tasks into the curriculum. They see an even greater difficulty in organising the tasks as part of an integration of different subjects. As Estonian teachers are overburdened with work and organise their teaching on a lesson-by-lesson basis (as well as lacking experience in co-writing with students), these difficulties are at least partly understandable. At the same time, the interviews revealed that teachers focus their lessons primarily on increasing the volume of knowledge, rather than on developing different skills, which is why they find it too time-consuming both to develop a Wikipedia assignment and to carry it out (also as part of an integration of subjects). Teachers plan lessons individually and are used to teaching their subject, but they also see that the task of writing or translating a Wikipedia article could be suitable for extra-curricular activities, e.g., project days and weeks, where it is also easier to organise cross-curricular integration.

The aforementioned results provide a good insight into how teachers are already integrating Wikipedia into their teaching, and what supportive and inhibitive aspects they have experienced, or what they foresee in the future. In order to support teachers in integrating Wikipedia into their teaching, there is a need to create guidance materials and sample exercises to save teachers time and to inspire and encourage them to implement and share new practices. The basis can be taken from the program “Reading Wikipedia in the Classroom”, created by the Wikimedia Foundation, which includes a 3-module Teacher’s Guide for engaging Wikipedia in
the secondary context and requires adaptation to the Estonian context. Additionally, Wikimedia Eesti has developed teaching materials (https://wikimedia.ee/oppematerjalid/ (accessed on 7 April 2023)) for using Wikipedia in education.

According to the Estonian national curriculum, one of the objectives of the school program at both basic and secondary levels is extensive text processing. This entails reading, analysing, and writing different types of texts, as well as using various sources and environments. Through these activities, it is possible to develop students’ subject-specific and transferable skills. A Wikipedia article is one of the contemporary authentic texts that students can write for actual publication, which could motivate them to collaborate with others in writing, providing feedback, publishing, and sharing. Similarly, Wikipedia competes as an environment for students’ attention with other multimedia channels and online platforms, in both educational and non-educational contexts.

5. Conclusions and Future Directions

This study contributes to the discussion on the educational potential of Wikipedia in secondary schools, using the example of the Estonian context. The findings of the study suggest that by incorporating Wikipedia into the classroom as a respected teaching tool, teachers prepare their students to be both discerning consumers and producers of information. The research-based data collected in the current study indicate that the main focus of Wikipedia-based tasks lies in (active) information consumption, including information retrieval and the critical evaluation of sources. This focus is at least partially derived from teachers’ personal experiences of using Wikipedia. It is worth emphasising that such a focus is justified, considering that teachers perceive students as struggling specifically with critically evaluating sources. However, it is important to note that the pedagogical possibilities of Wikipedia are not limited to shaping the role of active consumers only; diverse text creation tasks can also provide students with the role of producers. However, despite the purposive sampling of schools/teachers that are partially Wikipedia-friendly, only a few teachers make use of this opportunity. This inclination may stem from teachers’ limited awareness of the Wikipedia environment and also from the fact that the intended learning outcomes outlined in the curriculum can be achieved through other means, including other texts.

The obtained results cannot be generalized to the entire Estonian teaching staff, since the study included schools and teachers who had prior knowledge of the use of Wikipedia in teaching. Additionally, the majority of the interviewees were teachers of humanities and social sciences. In the future, it is necessary to involve other schools in the study and increase the representation of teachers from various subjects, particularly in the natural sciences, to obtain a comprehensive understanding of the use of Wikipedia in different educational levels of Estonian general education schools. Furthermore, while the current study highlighted various 21st century skills that can be developed through Wikipedia-based tasks, future research could focus on specific skills (such as information retrieval and critical thinking), using experimental or action research. Such an approach would provide more diverse insights into the development of 21st century skills in general education schools.


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