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Roy Krøvel

Abstract

The article reports on how a wiki was introduced in the teaching of Development and Environmental Studies to journalism students in Oslo, Norway and intends to contribute to the understanding of how students use wiki technology to produce knowledge. The findings indicate that using wikis stimulates cooperation between students and strengthens collective processes of learning. Even more importantly, the investigation shows that using wikis can improve the teacher's understanding of the process of learning. However, some lecturers found serious framing problems in articles regarding lectures they had given, especially when they had been introducing new terms or new perspectives on complex issues. To avoid a process where students repeat and mutually reinforce each other's misrepresentations, it is necessary to construct a scheme of systematic feedback, including perspectives from lecturers and teachers.

Keywords:

Action research, depth of intention, interpretation, journalism, representation, wikis

Introduction

In 2004, Jeremy Williams and Joanne Jacobs claimed that "blogging has the potential to be a transformational technology for teaching and learning" (Williams & Jacobs, 2004, p. 244). Williams and Jacobs were particularly intrigued by the possibility of providing students with a high level of autonomy and, at the same time, an opportunity for interaction with their peers. This had proved particularly valuable since students learn as much from each other as they learn from instructors or textbooks (Williams & Jacobs, 2004). Today, the same could be said about Wikis. According to Greenhow, Robelia and Hughes, Web 2.0 facilitates communication and learning in ways that require "a new wave of research question", especially related to learner participation and creativity (Greenhow et al., 2009b). In order better to understand and take advantage of the potential of Web 2.0 in higher education, Greenhow, in particular, called for more research on student learning with Web 2.0, both inside and outside classrooms. Ronald Owston, meanwhile, called for the investigation of teacher learning with the Web, in particular "teachers changing from a traditional pedagogical orientation to an inquiry-based, student centered approach" (Owston, 2009, p. 272). Teachers need to develop their knowledge through Web 2.0 practices. They also need to model these practices in the classroom (Greenhow et al., 2009b).

This article is based on reflexive action research on such usage of wikis in teaching journalism, in part as a response to these and other calls for more research on web 2.0 and higher education. It reports on how a wiki was introduced in the teaching of Development and Environmental Studies to students in the fourth semester of the

Bachelor's degree in Journalism at Oslo University College, Norway. It explains the problem-oriented pedagogy and the specific context of wiki usage.

Social media and Web 2.0 are often used interchangeably and have been defined or used in a number of different ways. The terms are generally used with reference to groups of technologies, for instance blogs, wikis, podcasts and RSS feeds, "which facilitate a more socially connected Web where everyone is able to add to and edit the information space" (Anderson, 2007, p. 5). The employment of more participatory technologies in education has already been explored by researchers from a variety of perspectives (Greenhow & Robelia, 2009a, 2009b; Greenhow, Robelia, & Hughes, 2009a; Greenhow, et al., 2009b; Luckin et al., 2009; Owston, 2009). Wiki technology can thus be understood as a particular form of communication technology enabling a more participatory form of online communication. A wiki is a page, or a collection of Web pages, designed to enable users to contribute or modify content (Catalina, 2009). Wiki technology shares many of its collaborative practices with other Web 2.0 technologies, but is mostly employed to facilitate the collaborative production of texts, as, for instance, on Wikipedia. It is precisely the process of collaborative production of texts in a formal educational setting that is the focus of this article.

The article intends to contribute to the understanding of how students use wiki technology to produce knowledge. It takes an exploratory approach, reflecting on a number of issues as they appear as part of the experience of employing wiki technology as a pedagogical tool. How do journalism students use wikis to produce knowledge in the context of their course? What is the nature of the knowledge produced? What can course instructors learn about their students' knowledge-building process by using wikis in their teaching? In addition, the article also reflects on the quality of the knowledge produced. To what extent are the students able to summarise and re-present what textbooks and lecturers say in a way that reflects an understanding of what the textbooks or lecturers are trying to convey? This second category of research questions deals with the quality of the knowledge produced by the students.

Existing literature on Wikis and participatory forms of learning and teaching

The article is based on critical realism as a basis for research (Banfield, 2004), a basis which permits a diversity of methodologies and multiplicity of epistemologies. However, critical realism stands out from other philosophies of science by prioritising ontology (Hammersley, 2007) and this means that critical realism argues against reducing statements about the world to statements about our knowledge of the world (Bhaskar, 2010, abstract). From a critical realist point of view all claims about natural and social reality are fallible, but not equally fallible, and it is thus also necessary to attempt to evaluate the validity of statements about the world in relation to a notion of social or natural ontology (Bhaskar, 1997, 2010). Learning is about producing knowledge, but also about the quality of knowledge. I will not attempt to define the contentious term "knowledge" here. From a critical realist perspective, however, "knowledge-producing fields" comprise both "relational structures of concepts and methods for relating these to the empirical world *and* actors positioned in institutions within specific social and historical contexts" (Maton & Moore, 2010, p. 5). According to Maton and Moore, some forms of knowledge are "more epistemologically (or aesthetically) powerful than others" (2010, p. 7). Pedagogy should take account of this. In this article, I have evaluated the knowledge produced by the learners by employing Arne Næss's concept "depth of intention". I will return to this aspect of learning

shortly, after first making a few comments on the social and collaborative aspects of using wikis as a pedagogical tool.

Wikis can help students to attain skills in collaborative work and to develop critical and reflexive practices (Bruns & Humphreys, 2005, pp. 25-32). Wikis can also help to engage students in collaborative writing activities, thereby developing collaborative skills (Forte & Bruckman, 2006). Collaborating with other students on solving a task or a problem, for instance, means exchanging information and perspectives with other members of the team. This helps to develop understandings of how one standpoint or perspective is related to other possible perspectives, thereby facilitating a reflexive understanding of knowledge.

One investigation showed that the most noteworthy benefit of employing Wikipedia in classrooms was the sense of personal achievement and ongoing engagement in the learning process (Pollard, 2008). According to McLoughlin and Lee (2007), wikis and collaborative writing and editing tools are useful because they improve and extend conventional writing approaches. Some have suggested other arguments for student cooperation in learning processes. McLoughlin and Lee (2007) claim that working in groups which cooperate is a more effective learning strategy than working individually, for a number of reasons. Using wikis, the students themselves can play an active role in producing knowledge, thereby improving motivation (Heafner & Friedman, 2008). According to Surowiecki, large groups exhibit more intelligence than smaller, more elite groups (Surowiecki, 2004). Teachers may therefore "restrain themselves from direct action, in order to promote free and democratic production of content according to the principles embodied in the 'wisdom of the masses'" (Wheeler, Yeomans, & Wheeler, 2008, p. 994).

If using wikis motivates students and facilitates critical, reflective practices, we might expect to find that the active participation and engagement with the wiki introduced in the teaching of Development and Environmental Studies (as discussed in this article) somehow resulted in improved learning. Many authors, however, have also warned of the dangers involved in using wikis in teaching, especially regarding problems concerning the accuracy of the information (Denning et al., 2005), and this makes it necessary to return to the issue I raised earlier of how to evaluate the quality of the knowledge produced by learners in a collaborative process.

One recent study found that the accuracy of Wikipedia is high (Chesney, 2006). Wikipedia comes close to Britannica in terms of the accuracy of its science entries (Giles, 2005). However, while many have believed that the accuracy of wikis will continue to improve over time, another study found that "roughly 20 per cent of errors can be attributed to surviving text added by the *first edit,* which confirmed the existence of a 'first-mover' effect … the results do not provide support for the idea of trusting surviving segments attributed to older edits" (Luyt et al., 2008, p. 318). When choosing a wiki for teaching purposes, it is therefore important to include features such as authentication and tracking (Augar, Raitman, & Zhou, 2004). By including features for tracking it should be possible to learn more about how possible mistakes or misunderstandings by "first-movers" are corrected by other students or incorporated into the emerging corpus of knowledge.

As indicated earlier, I will build on Arne Næss's work to evaluate the quality of the knowledge produced by the learners. The concept "depth of intention" was developed by Næss and used to describe the quality of a statement (Gullvåg, 1983; Næss, 1953) because a statement can be misunderstood. Put simply, "depth of intention" means that the quality of communication improves when the speaker is aware of other possible interpretations of what is being stated. It is believed that the possibility of misunderstanding decreases when the speaker has such "depth of intention". Discussing

and debating with other students should help to develop depth of intention, resulting in fewer mistakes and misunderstandings. Depth of intention is seen as being developed when students are stimulated to discuss different or alternative perspectives and interpretations with other students. Inspired by Næss, many critical realists have also found Wright's definition of realism useful, as it understands learning as a process in search of deeper insights into reality: "A way of describing the process of 'knowing' that acknowledges the reality of the thing known, as something other than the knower (hence 'realism'), while also acknowledging that the only access we have to this reality lies along the spiralling path of appropriate dialogue or conversation between the knower and the thing known (hence 'critical')" (Wright, quoted in Lynch, 2007, p. 6). In Journalism Studies both Lynch and Wright have argued for critical realism as a foundation for science, in line with the perspective proposed by Næss (Lynch, 2008; Wright, 2010).

Næss argued that we should always strive for quality in representing the views and statements of the other. According to Næss, the goal should be to represent the other in a way that the other would find acceptable. Students should therefore strive towards representing what is said during a lecture in a way that the lecturer finds acceptable, in addition, of course, to developing their own perspectives on the issue being discussed. By following the development of the process of collaborative production of knowledge on the wiki, I hope to be able to contribute to the existing knowledge on this particular aspect of learning.

Methodology

Seventy-four students participated in the course "Development and Environment Studies for Journalists" from March to June 2009.[1] Seventy-two participated a year later. All were second year students of the Bachelor of Journalism degree at Oslo University College in Norway preparing for upcoming individual fieldwork of at least four weeks in the global South. A number of writing assignments were given to prepare the students for the fieldwork by stimulating research on the site and topic of the individual fieldwork, hopefully fostering further reading, reflection and finally production of the knowledge necessary for successful fieldwork. During the course, each student had to contribute at least seven short texts on themes related to lectures. The students were free to decide for themselves which topics to choose for their articles, as long as the topic was based on a lecture or a textbook. The texts were then discussed in groups of approximately seven students and one teacher, before being published on a closed wiki (jbi.wikidot.com). All articles were published on the wiki after group sessions. After publication, other students were invited to edit, add information or contribute fresh perspectives to already published articles, in the same way as on Wikipedia. The project resulted in a total of more than 300 articles, mostly co-written by three to seven students. The collaborative writing on the wiki was not organised by the teachers, but was left to be decided by the interests and motivation of the students themselves. The articles covered major aspects of the lectures given during the course and the curriculum, and were later made available for the students in their preparation for written and oral exams.

Qualitative investigation of participation and collaboration on the wiki

The methodology for this article was designed to answer the two categories of research questions presented in the introduction. First, how did the journalism students use wikis

to produce knowledge in the context of their course? The investigation of the production and publication of articles builds on information from the wiki and from the discussion in the groups. The wiki contains a function ("history") which makes it possible to follow the development of each of the 300 articles as students participated and contributed. Each new contribution was automatically forwarded to the teacher (me), so that the contribution of each individual student could be evaluated. I also investigated the later usage of the wiki in the period leading up to written and oral exams. This investigation was mainly made by using Google Analytics, which made it possible to evaluate patterns of use. When did the students use the wiki? How often? To which articles did they contribute? What themes did they find particularly interesting? This part of the investigation followed an explorative approach (Stebbins, 2001). I will provide more detail of this in my discussion of the findings.

Interviewing lecturers on the quality of articles published on the wiki

The second category of research questions deals with the ability to summarise and re-formulate what textbooks and lecturers say. The majority of articles on the wiki worked with statements made by lecturers. According to Næss, the students should strive to represent the lecturer in a way the lecturer would find acceptable. This is a very difficult task. First, it requires the student to try to understand what the lecturer is trying to say – which can be difficult in itself, as the topics are by definition mostly new to the students. There are therefore numerous possibilities for making factual mistakes or for misunderstanding the meaning of a statement made by the lecturer. In addition, the lectures are too long to be presented in their original form. The students therefore need to synthesise and thus re-formulate in their own words what they believe is the meaning, or the most important meanings, of the lecture. In so doing, the students "frame" their representations of the lectures. Framing necessarily means "selecting some aspects of a perceived reality and making them more salient in a communicating text" (Entman, 1993, p. 5). A frame suggests what the controversy is about and involves implicit information that gives meaning to an issue to and provide a context for the interpretation of the message. Framing was made more difficult by the fact that many students participated in the process of representing the statements made by the same lecturer. The students would each have had their own particular framing in mind, based on their individual backgrounds, cultures or embedded worldviews. The resulting article with its specific framing was therefore the outcome of a chaotic process in which no individual had the editorial responsibility.

Thirteen lecturers participated in the experiment. Each lecturer read and evaluated the articles that represented their statements and then commented on the reliability of the representations on several levels. First, they commented on possible factual errors found in the articles. Second, they looked for statements in the articles that indicated that the students had misunderstood what they had said or had intended to say. Third, the lecturers evaluated the framing of the article. Did the students manage to make important themes salient in their representation? Or did they choose to make other themes visible, while what the lecturer judged as most important was relegated to a less important status? How could this then be interpreted? The lecturers were then finally asked to evaluate the experience of being represented by the students. Six lecturers were interviewed. Seven, for various practical reasons, gave written answers to the questions.

A survey of the students after finishing the course

Finally, the students in the second year were invited to answer an online questionnaire (QuestBack) on issues that had come up during the first parts of the study. The students were asked to give their opinion (anonymously) on the quality of the course, the quality

of lectures, and the overall work-load, to assess their own degree of participation and (voluntarily and anonymously) reveal the grade received after written and oral exams. Fifty-three out of sixty-five students finishing the course participated. All the students voluntarily (and anonymously) agreed to reveal their final grades, thus making it possible to evaluate how different combinations of variables combines and correlates with specific outcomes (grades). The questionnaire consisted of questions designed for quantitative analysis and open questions inviting further comments and reflections designed to facilitate further qualitative analysis.

Research ethics

Since the researcher is also the teacher of the course, a brief comment on the research ethics is warranted. As a teacher, I participate in all the individual activities described in the methodology chapter, including the final evaluation, oral exams and setting the final grades for many of the students. Teachers at Oslo and Akershus University College for Applied Sciences are also asked to involve students in evaluation of the course itself, employing discussions, interviews, reference groups and/or surveys. As such, this research is an attempt to extend and improve an already ongoing process of improving teaching and learning. However, combining information from different sources could potentially lead to ethical problems such as, for instance, concerning the identification of individual students, so before undertaking the research I asked permission to use input from the exam results in the research. The request was discussed and accepted by the dean and the officers in charge of exam-related questions. Before publishing the results I asked for a second opinion from the Faculty of Social Sciences, as since the research started we have merged with Akershus University College and now belong to a newly created Faculty of Social Sciences. Again, the relevant authorities found the research to be a potentially valuable contribution to the process of improving the quality of education in the Faculty, but also underlined the importance of making sure that no single student could be identified in the article.

Results: Producing knowledge

A large number of articles were produced during the two years of the investigation. Between 300 and 500 articles relevant could have been included in the study, but many of those did not develop and were not much used. This was often the case when three or four students simultaneously began reporting on a lecture they had attended; typically, these articles would be merged into one article which then went on to develop further, while the others were abandoned.

The main focus of the current article will be 63 articles that were each viewed at least fifty times during the last four months of the research period. Typically, these articles would be subjected to between seven and fifteen revisions between being initiated until the end of the period. In more than seventy-five per cent of the cases between four and ten students participated in the writing and editing of the articles.

The articles dealt with most of the themes covered in the curriculum and the lectures, for instance:

1. Journalism, skills, ethics, genres and narratives;
2. Environment, environmental movements, climate change issues and environmental ethics;

3. Development aid, development theory, critical perspectives on development and alternative perspectives and perspectives from the South on development;
4. Articles on specific issues in specific countries or districts.

Typically, an article would be initiated by one student who, after finishing the first revision and logging out, would usually return to do a second and a third revision – possibly after remembering more topics that should have been included in the article. The second or third student to join in would normally begin by searching for articles related to a specific lecture or a topic from the curriculum. This is when the existence of more than one article related to a lecture or a specific topic would be discovered. In most cases, this student would then choose to continue working on the best of the "competing" articles, cutting and pasting the most valuable parts of the other articles into the chosen one. This cut and paste work would almost always end with the student adding a few lines of his or her own and, often, deleting a few elements to make the article more accessible. At this point it should be mentioned that these students have systematically developed their skills in writing and editing over the first two years of the journalism education. Most of them do not find it difficult to express themselves in writing and to participate in a semi-public process of content production in full view of their peers. It should be noted that other students could very likely have reacted differently if asked to participate in the same way.

At this point, all the other students would have been automatically notified by email about the ongoing writing and revising process. The most curious would access the page to check out the content, some adding a few lines themselves in the process. Those who had already submitted a few lines on the topic in question would be curious to see what others might have done to their input. Each process of editing required the student to read and reflect on what the others had already written; thus the wiki seems to have functioned as a "architecture of participation" (O'Reilly, 2004). It stimulated what McLoughlin and Lee described as a "less hierarchical form of learning based on small teams, sharing, content creation, and the use of ICT to access, create, share and continually improve ideas" (McLoughlin & Lee, 2007, p. 48). The results also seems to verify Bruns and Humphreys' claim that Wikis can help students to develop critical, reflective practices (Bruns & Humphreys, 2005).

Interestingly, the research did not uncover any instances of what some researchers have dubbed "Wiki Wars", heated conflict over definitions or perspectives explicitly or implicitly expressed in Wikipedia articles on contentious issues (see for instance Shah, 2009). The intimate collective writing and revising process described above could very well be expected to lead to heated arguments over definitions or perspectives on issues such an climate change, indigenous peoples, war and peace and many more. I propose that this absence of WikiWars is due to the fact that these students, in contrast to many of those participating on Wikipedia, interact on a daily basis. The online cooperation is grounded in day to day social interaction, which makes the participants more likely to show each other respect when editing and producing articles (Enli & Skogerbø, 2008). It also means that the students have a number of other channels for communication and for deliberation on issues of potential disagreement. Disagreement and misunderstandings can be discussed and possibly cleared up outside the virtual world. It might also be that the students, who participate as part of an assignment, are less likely to have strong opinions on certain issues than those who participate voluntarily in writing and editing on Wikipedia. Finally, the group of students is a much more homogeneous group than the groups of people participating in writing and editing on Wikipedia. The students are more likely to have similar views, or at least some sort of

common ground on many issues that might have become contentious on Wikipedia. Using similar views or common ground to produce an article on what was said in a lecture proved to be effective in most cases. In some instances, though, building consensus and avoiding conflict, might be seen as a problem, especially when the topics called for deeper reflection or fresh alternative perspectives. I will return to one such example later.

Findings

Participation and collaboration on the wiki

The usage of the wiki went through four distinctive phases, each with its typical pattern. First, in October, approximately six months before the fieldwork, the students were engaged in the first exercises to define where to go (for example, country or region) and what to investigate. They were encouraged to make use of a number of different sources of information at this stage of the process, including books, newspapers, journals, resources on the Internet and the Wiki-site where the previous batch of students had published articles related to the research they had conducted a year earlier. The hypothesis was that the new batch of students would be particularly interested in learning from the last year's students, and therefore particularly interested in the Wiki site. This was not verified by the research. Only 6 per cent of the respondents agreed with the statement "it was very useful to see what the other students had done last year". The largest group of students (43 per cent) had found the wiki "a little useful" at this stage of the process. Nonetheless, the wiki received a total of 188 visits on the most active day (19 October) during this period. More importantly, each visit lasted on average more than thirteen minutes, and the students visited on average eight different pages during each visit. The visits were relatively longer and "deeper" (more pages viewed) than later in the research process, indicating that the students were usually surfing from one page to another in search of ideas and inspiration. The results indicate that at this stage most students found other sources of inspiration more useful than the wiki. This type of usage continued to dominate in December and January, when the students moved on to the next phase in the preparations of the fieldwork: buying tickets, reserving accommodation snd so on.

The lectures and group sessions began in earnest in March. This is also when the students were asked to publish articles on the wiki on themes from the curriculum and the lectures. The pattern of use changed noticeably. The number of daily visits increased, reaching 420 on 26 March, approximately six daily visits per registered student at this time. Each visit was shorter than in October, lasting on average three to four minutes. During such a visit each student would visit three pages, where the first page visited would normally be the welcome page, the second would be "search" or "recent changes" and the third would be a page dedicated to a topic the student was participating in writing or editing. The usage of the wiki was much more focused on articles on topics of particular interest for the student than earlier in the process. This is also when the contribution of one student became interwoven and integrated into the contributions of other students. Each student needed to formulate his or her thoughts in relation to what others had already said. Building on McLoughlin and Lee, we could expect that working cooperatively and sharing ideas would stimulate a more productive learning process than asking the students to work in isolation (McLoughlin & Lee, 2007). This was clearly the case for many students, but definitely not for all.

The largest group of students (41 per cent) did not see any substantial difference between the wiki-based form of cooperative writing and more traditional forms of written assignments, or did not have any opinion. A slightly smaller group, 39 per cent,

felt that this method improved the learning process. Twenty per cent had a negative perception of the experience. The attitudes towards this type of learning process will become more interesting when, later in the article, I discuss how these attitudes correlate with the quality of the final exams, as measured by a team of sensors.

The usage of the wiki dropped when the students travelled to do their fieldwork and it continued at a relatively low level as they began preparing for written exams. In May, the students handed in a reportage, produced during the fieldwork, in addition to one analytical essay on the topic for the reportage and the sources of information the student had made use of. The usage of the wiki continued to be noticeably lower than in March, reaching a maximum of 195 visits on 20 May. The majority of students later reported that they had made little use of the information on the wiki during this phase of the learning process. This changed markedly as the oral exams approached in June. The number of visits rose to new heights, reaching a zenith of 425 visits and a total of 817 page views on 14 June. These visits were typically quick, lasting little more than a minute, going directly to the pages of interest, reading a few lines before signing out – a pattern of use one might reasonably expect in preparation for oral exams.

We observe that the usage of the wiki went through several distinctive phases, each best understood in relation to where the students were in the learning process. During the whole process, the wiki generated a total of 7,900 visits and 26,559 page views. Each visitor this visited an average of three to four pages during a visit. The average visit lasted for four minutes and five seconds.

Is there a correlation between usage of the wiki and the outcome of the learning process?

An interesting correlation can be observed between the evaluation the students make of the wiki and the grades they are given as a result of the whole process. Those who see working jointly on the wiki as useful score significantly higher than those who did not find the wiki useful (see table. 1). Twenty per cent of those who felt that using the wiki had enhanced their learning process got an "A". Among those who did not see any point in using the wiki, none scored an "A". The average for those without strong opinions on using the wiki was 14 per cent. The same pattern can also be observed at the other end of the spectrum: 20 per cent of those who did not find the wiki useful scored "D" or worse (4, 5, or 6), that is, below average. Only 10 per cent in the group that had found the wiki useful scored "D" or less. At this end of the spectrum the numbers of students are too small to draw strong conclusions. The results only indicate that the pattern found among the top scorers is also present among those who were not as successful in their exams.

Table 1. Attitudes towards the Wiki: Mean, standard deviation, sample variance and confidence intervals of final grades.

A - Excellent. B - Very Good. C - Good. D - Satisfactory. E - Sufficient. F - Insufficient/Fail (A=1, B=2, C=3, D=4, E=5, F=6)

a. Group 1 (those who found working on the wiki useful) 20 students.

Mean	2.3
Standard deviation	0.9
Sample variance	0.9

90%	1.959 to 2.673
95%	1.890 to 2.741

(assuming Gaussian distribution)

b. Group 2 (those who did not find working on the wiki useful) 10 students.

Mean	3.1
Standard deviation	1.3
Sample variance	1.7

90%	2.431 to 3.769
95%	2.303 to 3.897
(assuming Gaussian distribution)	

While a pattern of correlations has been observed, it is nonetheless important to note that correlation is not the same as a causal explanation. First, there are many reasons to question how suitable the final grades are as indicators of the quality of a learning process. It is indeed difficult, possibly impossible, to agree upon a methodology for measuring the outcome of a complex learning process, especially when it involves cross cultural learning. In this case it is well worth noting that learning from cross cultural experiences develops gradually, often as the student looks back and reflects on the experience. Measuring at the end of the semester probably means that important elements of the learning process are not captured.

Nevertheless, the marks are given by two experienced journalists and academics and are based on two written assignments and an oral exam. In order to make sure that the students understand what they are expected to learn and how it will be evaluated, the examiners use a guideline for evaluating the exams which has been developed in cooperation with the students themselves. While the final grading is not a perfect indicator of a learning process, I would argue that it is, in this case, the best we have to inform systematic reflection on the quality of the learning process in relation to possible causal explanations.

Second, other causal explanations could lie behind the observed correlation between grades and perceptions of the wiki. A closer look at correlations between other factors can shed some light on this possibility. For example, both groups (those who found wiki useful as a tool for learning and those who did not) show very similar degrees of participation elsewhere, for instance participation in lectures. A clear majority claims to have participated in more than half of the lectures (60 per cent in both cases), but the reasons given for not being present during a lecture vary: by far the most common explanation (40 per cent) from those who found the wiki useful was "I had to work", while only a few (15 per cent) responded "I did not find the topic interesting". For the other group – those who did not find the wiki useful – it was the other way around: 30 per cent responded "I did not find the topic interesting", while only 10 per cent responded "I had to work". It should be mentioned here that many of the students actually work as freelance journalists for newspapers, television or radio. That some students have problems finding enough time to follow lectures and to work is well known among students and teachers alike at Oslo University College. The important message here is related to the interests of the students. The evaluation also indicates that those who did not find the wiki useful are also more likely to be less interested in the type of lectures given in this course: history, area studies, anthropology, environmental studies and similar topics. Conversely, they are more likely than the average student to recommend less focus on such topics and more on "journalism" in the future.

This and other results indicate that many in this particular group (those who did not find the wiki useful) see journalism first and foremost as something to be learned by practising journalism. The debate on whether journalism is best learned by practice or by studying at an academic institution is closely related to the debate on the status and importance of knowledge in journalism (Josephi, 2009; Schudson & Anderson, 2009; Wahl-Jorgensen & Hanitzsch, 2009). The largest group of students, in this case, typically also contend that more academics should give lectures to students of journalism, while a second group typically claims that journalists should be given preference. In this particular case those students who say they want more focus on "knowledge" in journalism education are significantly more likely to score top marks than those who say they would prefer more emphasis put on "knowledge" (see Table 2). One possible explanation for this might be that producing journalism in an unknown environment is different from the type of experience that the students have when practising journalism in Oslo. Having a solid base of knowledge about the society in which the student is doing fieldwork makes it easier for the student to identify good sources of information and thereby to improve his or her ability to interpret what is experienced and the information given by different sources. More investigation is needed before final conclusion can be drawn on the reasons for this finding.

Table 2. Attitudes towards knowledge in journalism education: Mean, standard deviation, sample variance and confidence intervals of final grades.

A - Excellent. B - Very Good. C - Good. D - Satisfactory. E - Sufficient. F - Insufficient/Fail
(A=1, B=2, C=3, D=4, E=5, F=6)

c. Group 1 (those who would prefer less focus on knowledge) 13 students.

Mean	3.0
Standard deviation	0.6
Sample variance	0.4

90%	2.785 to 3.369
95%	2.729 to 3.425
(assuming Gaussian distribution)	

d. Group 2 (those who support increased focus on knowledge) 33 students.

Mean	2.2
Standard deviation	0.9
Sample variance	0.8

90%	1.904 to 2.429
95%	1.854 to 2.480
(assuming Gaussian distribution)	

Nonetheless, to produce more robust knowledge on the learning process the quantitative questions were followed by open fields inviting individual comments and reflections from the students. The comments shed some light on the relationship between the learning process, interests and the wiki. Many of those who expressed a positive attitude towards the wiki at the end of the semester say that they initially did not

understand why they were asked to publish on the wiki. Only gradually did they change their opinions. According to the responses given in the questionnaire, a majority of these students seems to have changed their minds during the phase initiated in March. Many explicitly state that adding something to an article to which several others had already contributed was difficult and valuable at the same time. It was difficult because the students had to "fit" their contributions to what others had already said and the style used by the others, and helpful because reflecting on how to do this stimulated insight into other perspectives, thereby deepening the understanding of the topic in question (Næss, 1953).

The best interpretation of these two correlations (between marks and perceptions of the wiki and marks and expressed interest in "knowledge") is to see interest in knowledge and usage of the wiki as variables mutually strengthening each other. Those who are interested in acquiring "knowledge" are probably more likely to be willing to invest time and energy in writing articles on the wiki in the first place. And in the open fields for comments they write that the interest in, and understanding of, the potential of using the wiki came gradually, only after some initial confusion and negativity towards having to learn or use yet another web-based tool. Several lessons could be learnt from this: first, it takes time and effort before using a wiki pays off for a student. Second, not all students are willing to invest the necessary time and energy. Third, those in this group of students who did invest the necessary time and energy did benefit, not only when writing analytical essays, but also when reporting journalistically.

Quality of the representation: factual mistakes and misunderstandings

The second part of the study deals with the quality of the articles and thus the knowledge produced by the students. Thirteen experienced lecturers participated in the project. All the relevant articles dealing with what the lecturers had allegedly said during the lectures were sent to the lecturers to be examined. A total of approximately 50 articles were examined in this way (the number of articles is only an estimate, since some articles dealt with issues covered both in lectures and in articles on the reading lists, and sometimes the students had not included the necessary references). The lecturers responded to the questions orally or by email. Using this methodology makes it possible to test whether or not the students and the lecturer understand each other. If the lecturer feel misunderstood, it does not necessarily means that the students have misunderstood what has been said. Most lecturers have had the experience that what we actually say is not always what we had intended to say. In addition, even when, as teachers, we manage to express ourselves as we intend, what we say will be open to interpretation based on the existing experience and knowledge of the students. Different students hear different things and find different meanings in what is being said in the classroom.

A large majority (more than 90 per cent) of the lecturers used words like "impressive", "very good", "good" and "acceptable" to describe the articles written on topics related to their lectures. This indicates that in general the quality of the articles was good, according to the judgment of those lecturers who were deemed to be experts in their respective fields. Most of the srudents succeeded in capturing the main points of the lectures and in satisfactorily representing what the lecturers had said. It is not very surprising to find that the quality in general was good, especially since these students of journalism had been trained in relevant skills such as reporting, quoting and summarising. Nonetheless, two lecturers found clear evidence of misunderstandings, and one of the two found "many misunderstandings and misrepresentations". It is therefore necessary to delve into the reasons, and possible consequences, for these misunderstandings. First, the articles based on the lecture of one particular lecturer were

among the most-read articles on the site, and in addition this lecturer's name was also the most-searched. It is therefore clear that the students deemed the perspectives of this lecturer to be very important while, at the same time, they found it difficult to understand the topics discussed in the lecture. Investigating the history of these articles, it is furthermore clear that many of the misunderstandings resulted from some of the first entries made on the topics and that, when adding new entries, later students seemed to build on the misunderstandings of earlier entries. While almost all of the students read the articles containing the misunderstandings, the misunderstandings were not corrected by later students. This casts doubt on the notion of the "wisdom of the crowd" (Kittur & Kraut, 2008; Surowiecki, 2004; Wilkinson & Huberman, 2007). In this case "the crowd" was not able to use its collective "wisdom" to improve the quality of the representation of the topics discussed by this lecturer.

Doubt about the accuracy of the content on the wiki must lead us to reflect critically on the usage of the wiki as a tool for learning. The example described above seems to indicate that misunderstandings and mistakes can be reproduced and reinforced when students jointly contribute online to an understanding of what the lecturer said or intended to say. One hypothesis might be that the lecturer was unclear and did not succeed in expressing herself or himself accurately. But in this particular case I don't believe this to be the reason for the misunderstandings. I was present during the lecture and observed both the lecturer and the communication with the students. For me, there was nothing unclear about what the lecturer said (but, then, I was familiar with his topic and argument from previous lectures elsewhere and from scientific articles and books). For the students, the situation was different. This was the first time that most students were exposed to a very complicated argument from someone who insisted on the need to develop a precise critique of the dominating Norwegian discourse on the topic. The students and I drew on distinctive and different backgrounds and knowledge in order to interpret and learn from the lecture – and this was also, in my view, the reason for a number of misunderstandings in articles on the wiki related to this particular lecture.
Nonetheless, the examiners of the oral exams reported that the students had, in general, a satisfactory understanding of this particular lecturer's topics and perspectives, indicating that the students had made use of other sources of information (for instance, text books) in addition to the wiki, to clear up misunderstandings resulting from misrepresentation on the wiki site.

This example, representative for three or four instances of misunderstandings and misrepresentations found on the wiki, points towards more putting more emphasis on the pedagogical perspective when communicating complex arguments. Lecturers should engage in dialogue with the students in order to understand how they students interpret and understand what the lecturers are trying to communicate. The examples also illustrate how important existing knowledge and experience are when students use new information acquired in the classroom to produce knowledge. In the case cited above, the students simply incorporated what they heard in the lecture into existing and familiar bodies of knowledge and experience, while the lecturer had intended to present new arguments that required the students to be able to view the dominating existing discourse on the topic from outside the discourse. To describe the phenomenon experienced by this particular lecturer, it might be useful to employ terminology from the field of hermeneutics, using the term "horizon of understanding", as it is understood by Gadamer, instead of "frame" as understood by Entman (Entman, 1993; Gadamer, 1989). A horizon is not static, it changes as we move, as we learn and experience. The lecturer wanted to make the students see or understand the topic from a different perspective, to develop their horizon of understanding. But the lecture did not provoke the intended effect of broadening or developing the horizons of

understanding – instead, existing knowledge and experience seemed to exert a "gravitational pull" on the new information, sending it into orbit around what the students believed to know already about the topic. When lecturers did not succeed in making the students reflect on a topic from a different perspective, it often resulted in some frustration later, when the lecturers read what the students reported they had said.

Conclusion

This paper contributes towards a shared corpus of experience on using wikis in teaching (Potts, 2009). The results show that less than 10 per cent of the articles contained factual mistakes, which was better than the results from previous studies. Nonetheless, in almost all of these cases, having other students read and comment on the articles did not eliminate the mistakes. Peer review is not sufficient to guarantee accuracy in representation and quality in "depth of intention"; a system of feedback from lecturers is necessary to improve the quality of the articles. Moreover, as the students use the articles as a guide when entering a new field of knowledge, mistakes tend to influence other students, and are reproduced.

Factual mistakes are a relatively small problem, though, in comparison to mistakes in the interpretation of new information. Some lecturers found serious framing problems in articles regarding lectures they had given, especially when they had been introducing new terms or new perspectives on complex issues. This type of mistake is more difficult to measure than the factual mistake. Students process and interpret new information in light of their existing knowledge and experience. Mistakes in interpretation lead to misrepresentations of what a lecturer has said, seriously affecting the quality of the articles (Denning, *et al.*, 2005). This type of misrepresentation is not easily corrected by other students. On the contrary, other students accept the mistakes in interpretation made by the "first-movers" and build on them. To avoid a process where students repeat and mutually reinforce each other's misrepresentations, it is necessary to construct a scheme of systematic feedback, including perspectives from lecturers and teachers.

These results should stimulate critical reflection on some of the more optimistic statements on the possibilities of wikis and web 2.0 for learning. Notions of the "wisdom of the crowd" must be critically evaluated because "the crowd" sometimes produces knowledge based less on critical reflection on various possible interpretations of statements than on judgments based on previous knowledge ("prejudice"). While "prejudice" is necessary in any hermeneutical process of interpretation, the learning process must seek to reach beyond that which is visible from the perspective of previous knowledge ("prejudice").

Nonetheless, this research has indicated that using wikis stimulates cooperation between students and strengthens collective processes of learning. Even more importantly, the investigation shows that using wikis can improve the teacher's understanding of the process of learning. The wiki, in this case, helped the teachers to understand how the students learn and how they produce knowledge based on previous knowledge. This knowledge can be used by the teacher to reflect on how to communicate difficult topics in order to facilitate a good learning process for the students, even in cases where the students have little or no background knowledge. At the same time, the results indicate that using the wiki was most beneficial most for those students who invested substantial time and energy in it whereas other groups of students did not benefit as much.

Note

[1] Seventy-four students participated in the preparations for fieldwork and published articles on the wiki in 2009. For personal reasons nine students did not complete the fieldwork that year. A few of those returned a year later to complete the course.

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