

Wikis as digital learning resources in nursing education

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ABSTRACT

This article examined how first year undergraduate nursing students experienced the use of wikis as pedagogical learning resources in a social science module. The purpose of the study was to investigate how wikis contributed to collaboration and academic interests, using following question: How do students evaluate the use of wiki-based learning in a social science learning module? Are there possible patterns in the covariance between the questions that concern the evaluation of wiki-based learning? Are there any differences in respondents' ages related to the evaluation of wiki-based learning? The method used was a cross-sectional study. The sample consisted of all students attending classes in spring 2013.

Keywords

Wiki, Sociocultural, Andragogic, Blended learning

INTRODUCTION

The use of digital technology in higher education may contribute to improving students' digital skills, their understanding of particular subjects, and their awareness of how knowledge can be developed and created through collaboration online (Tømte & Olsen, 2013). In general, digital technology can be divided into two main categories – digital tools and digital media. Digital tools are 'physical'; examples include computers, software, smartphones, e-book readers and similar devices. In contrast, digital media can be subdivided into the 'cloud' and social media, blogs and wiki technology (Fossland, 2015). In the context of edu-

cation, wiki technology in particular is becoming increasingly popular due to its teaching and learning potential (Clark & Mason, 2008; Fitch, 2007).

Given health services' increasing dependence on technology, nurses will be expected to develop their information and communications technology (ICT) skills in the near future (Wilkinson, Roberts, & While, 2012). Such skills should be improved during nurse education, and various digital learning resources can contribute to this. A digital learning resource is an educational tool that can be used for learning purposes with the exploitation of ICT (Utdannings- & forskningsdepartementet, 2004–2008, p. 23). Wiki technology is an example of a digital learning resource and can contribute not only to digital competence but also to collaboration, problem solving, documentation skills and critical thinking, all of which are core competencies of nursing education and essential to professional nursing practice (Kunnskapsdepartementet, 2008).

A wiki is an interactive website that allows collaborative modification of its content. It is a collective online resource, where in principle anyone can contribute, revise and delete content, and changes take immediate effect. Relying on principles of reciprocity and transparency, a wiki is an educational tool that may stimulate students to become active contributors of content rather than simply passive consumers of information (Cole, 2009; Horgen & Nordseth, 2009; Wikipedia, 2014). Wikis may also create opportunities for new forms of collaborative learning, provide excellent training in the critical evaluation of sources, and impose more stringent criteria for linguistic precision and clarity (Koch, 2006).

All of these potentialities in a wiki can be associated with sociocultural learning theory. This theory emphasises interactive, collective knowledge and learning at the individual level as intertwined with the collective. Central concepts here are social interaction through situated learning (Lave & Wenger, 2003), use of language, and mediating artefacts and 'scaffolding' (Witteck, 2012).

Nursing students, like all other student groups, are diverse, and acquire knowledge in various ways. Age, gender and socioeconomic background, as well as individual learning styles, are all factors that may influence how students learn and evaluate various teaching methods (Bjørke, 2006). According to the Norwegian Nurses' Association (Holter, 2013), the average age of nursing students is twenty-three years, and they can therefore be considered quite mature. This can be important when it comes to learning, because following the notion of andragogy, adults and children learn in different ways (Knowles, Holton Iii, & Swanson, 1998). 'Andragogy' is defined as 'the art and science of helping adults learn' (Knowles et al., 1998, p. 61). The theory is based on several assumptions, namely the need to know, the learner's self-concept, the role of the learner's experience, readiness to learn, orientation to learning, and motivation. The use of digital technology in educational contexts can help to accommodate individual learning styles and provide more flexible opportunities to support different ways of learning of learning (Krokan, 2012).

AIM AND PURPOSE

A recent published integrative review claims that wikis can be useful in improving student learning outcomes and the acquisition of new knowledge (Trocky & Buckley, 2016). The article highlights a call for more research on the effectiveness of wiki use, especially in the

area of nurse education. This article explores how nursing students in their first year of study perceive the use of wikis in a learning module by investigating the following questions:

- How do students evaluate the use of wiki-based learning in a social science learning module?
- Are there possible patterns in the covariance between the questions that concern the evaluation of wiki-based learning?
- Are there any differences in respondents' ages related to the evaluation of wiki-based learning?

THE STATE OF KNOWLEDGE IN THE FIELD

Several studies have examined how students evaluate the use of wikis in teaching (Biasutti & El-Deghaidy, 2012; Fleming, McKee, & Huntley-Moore, 2011; Hadjerrouit, 2011). However, few have examined nursing students' evaluation of wikis as a learning tool (Ciesielka, 2008; Morley, 2012). An explanation for this may be the limited use of social media in nursing education (Tuominen, Stolt, & Salminen, 2014).

Research on the use of wikis has been carried out in the fields of teacher education (Biasutti & El-Deghaidy, 2012; Hadjerrouit, 2013) and nursing education (Ciesielka, 2008; Morley, 2012). In a study by Hadjerrouit (2013), student teachers were reluctant to contribute to or give comments through the wiki, and hence there was little collaboration on the wiki. This was explained in relation to the students' lack of collaboration skills and weaknesses concerning the wiki's functionality. Hadjerrouit also discusses whether the wiki is a suitable tool for collaborative writing, and argues that it is a tool more suited to brainstorming and similar activities. He also points out that learning outcomes will be low unless the learning activities are well organised (Hadjerrouit, 2011).

Ciesielka's (2008) study provides different findings from those described above, reporting that the wiki is suited to any kind of project that involves student collaboration. Ciesielka (2008) claims that wikis can create an infrastructure that simulates real work situations, playing an important role in the students' learning. In addition, Morley (2012) shows that almost half of nursing students evaluated wikis as a useful communication tool, while one-third said that they provided opportunities for academic discussion. Furthermore, in medical education, the use of wikis is described as a good and positive working method because it may lead to increased collaborative learning (Rasmussen, Lewis, & White, 2013). The study involving medical students showed that wikis could contribute to shifting the focus from instruction-based learning to communication-based learning. Moreover, Fleming et al. (2011) show that learners' ages resulted in different evaluations, such that older students had a more active learning style than younger ones.

As demonstrated above, studies on the use of wikis have reached opposite conclusions. These differing views invite more systematic examination of learning through wikis.

USING A WIKI IN A TEACHING PROGRAMME

In autumn 2012, a common curriculum was introduced with an increased focus on digital learning for full and part-time bachelor's study programmes in nursing at Telemark University College (TUC; (Høgskolen i Telemark, 2012). This provides part of the background for why we used a wiki as an educational learning tool in a social sciences module in the students' first year of study. Furthermore, the wiki was introduced to motivate the students' interest in social sciences and health promotion, thereby encouraging them to participate in social debates using various social media platforms.

The wiki was to be used in a large student group of 189 students; thus, careful planning and organisation were required prior to its use. The students were divided into thirty learning groups of seven or eight students. Three supervisors guided seven to eight groups each. A homepage was designed consisting of sixty separate social science terms and concepts before the actual wiki teaching was initiated; the aim was for students to add content to the terms and concepts. The free screen-capture program Jing was used to make short videos about how to get started with the wiki – how to insert images, how to make a table of contents and so on. The screen recordings were disseminated to students in advance via the Fronter learning management system. In addition to the videos, auditorium instruction on the use of the wiki was also given in plenary, and students were offered technical assistance as a follow up to the instruction. However, there was little demand for technical assistance.

The module included two compulsory submissions – one group assignment and one project. Students were required to use the wiki in both assignments. The group assignment specified that students were to write two articles using the wiki. The project work required that the students use the wiki articles they had developed as a source of knowledge. The course assignments aimed to develop the students' familiarity with the subject material, help students to practise collaboration, and develop their relational competence and knowledge using the wiki. A further aim was for the students to gain experience in generating the subject material, which they were also to acquire in the module.

METHOD

Design

The study employed a questionnaire-based design, as this was the most expedient way of posing standardised, structured questions to a sample group of students. The study adopted a cross-sectional survey approach (Ringdal, 2013).

The sample and data collection

The sample group comprised 189 nursing students at TUC in their first year in spring 2013. The questionnaire was distributed to students electronically, three weeks after the start of the module, on the same day that they submitted their coursework. The timing was designed to coincide with the completion of a particular coursework requirement.

Developing the questionnaire

A questionnaire was developed to investigate students' views regarding the use of wiki technology and its benefits. The questions were inspired by a similar study among master's stu-

dents in educational technology (Coutinho, Bottentuit, & João, 2007). The questionnaire comprised three parts (see Table 1). Part 1 consisted of six closed questions concerning demographic data, students' use of social media in general and their use of the instructional videos. In part 2, students were asked to respond to nine statements concerning the teaching programme. The response options were formatted as a Likert-type scale (Ringdal, 2013), with five fixed responses ranging from 1 = strongly disagree to 5 = strongly agree. Part 3 asked students how much time they estimated that they had spent working on the project and included an open comments field where students could add more detailed remarks. This article reproduces responses to the questions and statements in Parts 1 and 2 only; part 3 is not taken into consideration. The questionnaire is presented in Table 1 below.

Table 1 Survey questions

Part	Questions	Response options
1	1. Gender	Male, Female
	2. Age	Under 25, 25-40, over 40
	3. Have you worked with wiki technology previously?	Yes, no
	4. I use social media on a regular basis	Facebook, Twitter, blogs, none of these
	5. Did you learn how to use a wiki by watching the instructional videos?	Yes, no
	6. How satisfied were you with the instructional videos?	Very satisfied, satisfied, not satisfied
2	7. Using a wiki helped to stimulate my interest in social sciences	1=strongly agree...5= strongly disagree
	8. Using a wiki helped me to see connections between the different social sciences	1=strongly agree...5= strongly disagree
	9. Using a wiki helped me to organize the academic content	1=strongly agree...5= strongly disagree
	10. We learnt to assess the quality of the content before publishing the wiki	1=strongly agree...5= strongly disagree
	11. Using a wiki helped me to understand how a group can generate knowledge by working together	1=strongly agree...5= strongly disagree
	12. Participating in the wiki helped me to acquire knowledge that I would not have managed to acquire working alone	1=strongly agree...5= strongly disagree
	13. Working on the wiki resulted in more collaboration between group members than usual	1=strongly agree...5= strongly disagree
	14. I liked the activities that were developed using the wiki	1=strongly agree...5= strongly disagree
	15. Everyone in my group participated actively in work with the wiki	1=strongly agree...5= strongly disagree
3	16. I would estimate that the approximate amount of time I spent working on the wiki was	Fewer than 10 hours, 10-20 hours, more than 20 hours
	17. Do you have any additional comments regarding the questions in this study?	

Ethics

The study was approved by the Norwegian Social Science Data Services. The National Committee for Research Ethics for the Social Sciences and the Humanities' ethical guidelines for social sciences, humanities, law and theology were followed (Kalleberg, 2006). All participants were given both oral and written information in advance of the study, and told that participation was voluntary. The students were given information during lectures and had an opportunity to ask questions.

Analysis

The statistical analyses were performed using the computer program SPSS, version 19 (IBM, 2010). A factor analysis was conducted to determine possible patterns in the covariance between the questions that concerned the evaluation of wiki-based learning. Pearson's correlation was used as a method for analysing the correlation between the evaluations of collaboration and academic interests. The p-value was used to test statistical significance.

Participants were divided by age into 'older' and 'younger' respondents. Because only sixteen students who enrolled in the study programme were older than forty years, it was considered appropriate to merge these students with the group of students aged twenty-five to forty; this group was labelled 'older students'. The remaining students of twenty-five and younger were placed in the category of 'younger students'. This division was employed to discuss what Prensky (2001) terms 'digital natives' and 'digital immigrants'. Younger students was categorized as digital natives and older as digital immigrants. The following analysis is thus also concerned with comparing the 'younger students' to the 'older students'.

RESULTS

Gender, age and digital experience

A total of 143 students (76%) completed the questionnaire. The gender distribution in the sample was 14 (9.8%) men and 129 (90.2%) women. The age distribution in the sample was 79 (55.2%) younger and 64 (44.8%) older students. Table 2 shows how students' experiences with digital and social media were distributed with regard to gender and age. In addition, the table shows the students' previous experience with wiki technology, use of social media (Facebook, blogs and Twitter) and whether they had used instructional videos to learn how to use wikis.

There was a considerably higher proportion of women than men in the sample. Table 2 shows that significantly more men had previous digital experience with wikis and Twitter than women, and significantly more men used the instruction video to learn wikis. A higher percentage of women regularly used Facebook, and women also used a blog significantly more often than men.

Table 2. Distribution of digital experience in relation to gender and age. Percent answering affirmatively

Digital experience						
Gender and age	Previous experience in using wikis?	Use Facebook regularly	Use Twitter regularly	Use a blog regularly	Don't use social media	Used the instruction video to learn the use of wikis
Male	14.3% * (2)	92.9% (13)	21,4% *(3)	0%(0)	7.1**(1)	50.0%* (7)
Female	3,1% (4)	99,2 %(128)	4,7% (6)	10,9 % (14)	0% (0)	20,9% (27)
Younger	5,1% (4)	98,7% (78)	7,6% (6)	10,1% (8)	0% (0)	10,1% (8)
Older	3,1% (2)	98,4% (63)	4,1% (3)	9,4% (6)	1,6% (1)	8,1% (6)

Proportion significantly different between groups: ** $p < .01$ * $p < .05$

Wiki-based learning in relation to academic interest and collaboration

An initial inspection of the covariance structure and exploratory factor analyses, including examining of the scree plots and eigenvalues, indicated that two main components could be identified if questions 14, 15 and 16 were excluded. The latter items showed rather weak intercorrelations; thus, they were not scalable, while at the same time, they were unrelated to the two main dimensions. Based on the factor loadings from the factor analysis (principal components), two components were extracted and labelled, namely (1) academic interest and (2) collaboration. The 'academic interest' index was an average of the answers to questions 7–9 (Table 1) and related to interest, connections between the different social sciences and organising the content. The 'collaboration' index was an average of questions 10–13 (Table 1) and related to how use of wiki as a collaborative tool provides access to knowledge in a group compared to knowledge conceived alone. These simple additive indices were extremely good representations of the said components, correlating 0.99 and 0.98 with their respective factor scores (which we chose not to utilise). The mean score in the 'academic interest' index was 3.5, while the standard deviation was 0.84 and Cronbach's alpha was 0.83. The mean score in the 'collaboration' index was 3.5, the standard deviation was 0.74 and Cronbach's alpha was 0.68. In other words, the student group as a whole found wikis to be similarly beneficial for both academic interest and collaboration. The average score on each item in the two indices gave some nuances to the students' perceptions of wiki use. These are reported in Table 3.

Table 3 Average score on each item in the two indexes “Academic interest” and “Collaboration”.

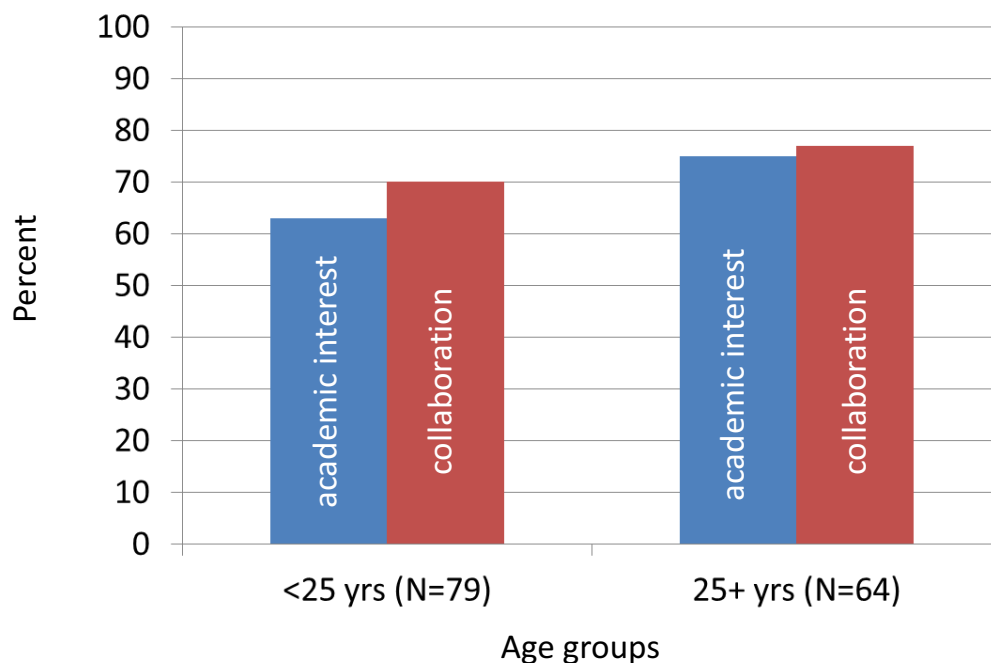
Components	Questions	Mean
Academic interest	7. Using a wiki helped to stimulate my interest in social sciences	3,42
	8. Using a wiki helped me to see connections between the different social sciences	3,34
	9. Using a wiki helped me to organize the academic content	3,75
Collaboration	10. We learnt to assess the quality of the content before publishing the wiki	3,77
	11. Using a wiki helped me to understand how a group can generate knowledge by working together	3,83
	12. Participating in the wiki helped me to acquire knowledge that I would not have managed to acquire working alone	3,06
	13. Working on the wiki resulted in more collaboration between group members than usual	3,16

Table 3 shows that the average score on each item in the two indices ‘academic interest’ and ‘collaboration’ varied from 3.06 to 3.83, indicating an overall positive tendency. The students found the wiki to be most beneficial as a tool for organising content, assessing quality and generating knowledge. The lowest average score was obtained for how useful students found wikis as tools for acquiring knowledge in a group compared to doing it alone.

The importance of the respondents’ age in relation to their perception of the benefit of wikis

Students who averaged above 3 (the midpoint of the 5-point response scale) on each of the indices were labelled ‘largely positive’. Using simple cross-tabulations of the dichotomous indices and two age groups, we analysed how older and younger students viewed the importance of wikis in relation to academic interest and collaboration.

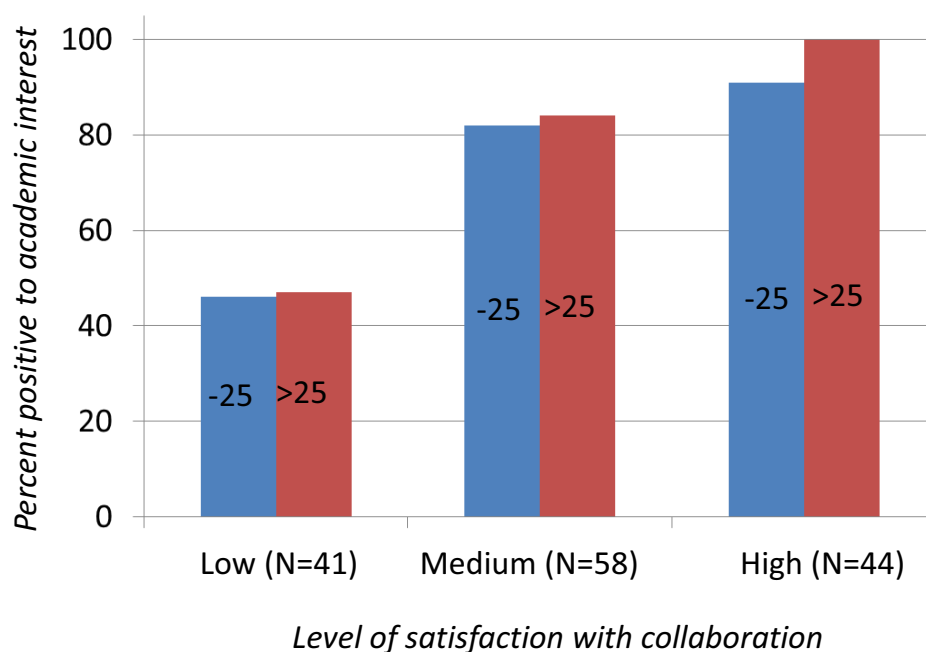
Figure 1. Percentage of students largely positive to aspects of wikis, by age.



The bar chart in Figure 1 illustrates that students evaluated both ‘collaboration’ and ‘academic interest’ rather positively, with slightly more positive evaluations for ‘collaboration’. Older students were slightly more positive than younger students, but these age differences were not statistically significant.

Using simple cross-tabulations, we also analysed how older and younger students considered academic interest at low, medium and high levels of satisfaction with collaboration using the wiki.

Figure 2. Percentage of students positive to academic interest, by level of satisfaction with collaboration and age.



The bar chart in Figure 2 illustrates that with increasing satisfaction with collaboration, the percentage of respondents who had a positive attitude towards the academic interest of wikis rose markedly. The linear correlation between the evaluations of the collaboration and academic interests indices was thus extremely strong (Pearson's $r=.52$ between indices), and about the same in both age groups ($r=.57$ and $r=.45$ for young and old participants, respectively). The correlations between the dichotomised indices shown in Figure 2 were correspondingly high ($\phi=.44$ and $\phi=.41$ for young and old respondents, respectively).

DISCUSSION

The students' evaluation of the use of wikis

The results indicate that the students reported being neither largely enthusiastic nor largely critical regarding the use of wikis related to academic interest and collaboration. This finding may be interpreted in several ways.

On the one hand, the results were in agreement with the findings of a survey conducted in an ICT and Library Studies master's level programme (Elgort, Smith, & Toland, 2008). Similar to this study, the results indicated that students' attitudes towards group work were generally divided and that the use of a wiki did not necessarily result in students changing such attitudes. In a survey of economics students at the undergraduate level (Witney & Smallbone, 2011), the results showed that students preferred to collaborate face-to-face and that they used other technological aids as collaboration tools, such as mobile phones

and email, rather than wikis. Tømte and Olsen (2013) point out that students showed reluctance to use digital technology because it did not increase their learning. This resistance was related the fact that the students were only positive when technology facilitated the communication flow and made it possible to share knowledge and study in a flexible way. According to sociocultural theory, learning is mediated by use of artefacts like signs and physical tools; the results could therefore imply that the students did not conceive the mediating artefact (Säljö, 2001, p. 82), the wiki, as enhancing learning.

On the other hand, the results may be interpreted in a different direction to suggest that wiki technology emphasises mutual engagement and collaboration in student groups (Ciesielka, 2008; Elgort et al., 2008; Morley, 2012). The above-average score indicates that the wiki created interest in the subject and amplified students' understanding of the relationship between the various social sciences. Such an interpretation is in agreement with Ørnes (2011), who points out that students in higher education consider the use of digital technology as both useful and relevant for learning.

Another interpretation may be that today's students have fair knowledge concerning the use of various social media, as presented in Table 2. They are particularly active on Facebook and a few tweet or blog. Thus, they can be fairly positive towards wikis, because they are already confident in the use of social media. This corresponds with other studies pointing out that many students contributed content to social networks, such as Facebook, MySpace and the like, and became familiar with subject content through the use of wikis and blogs (Brandtzæg, 2010; Ørnes, 2011).

In contrast to Hadjerrouit's (2013) study, the present research indicated that students evaluated the use of wikis positively. Table 2 showed that a large percentage of students used instructional videos when they ran into technical difficulties. At the same time, few needed guidance regarding the technical aspects of assignments. The work concerning the wiki in nursing education was formally guided by written guidelines, video instructions and teacher guidance. These are examples of 'scaffolding' (Bruner, 1997); according to Bruner (1997), such a practice implies that teachers give active help and support in new learning situations. This may have led to students evaluating the use of a wiki positively and not being reluctant to use wikis, in contrast to the study by Hadjerrouit (2013). The positive approach to using wikis may also indicate that a wiki is relatively intuitive and easy to use (Ciesielka, 2008; Horgen & Nordseth, 2009).

The results indicate that students' positive attitudes to the collaborative activity using the wiki were associated with positive 'academic interest'. The indices were rather strongly correlated. This can be interpreted to suggest that the evaluation of wiki-based learning does not reflect conceptually distinct, underlying dimensions but simply a manifestation of one common attitude of positive assessments of the wiki as a learning tool. This is in accordance with other studies performed in health education. Cieselska (2008) points out how use of wikis in nursing education was received positively because it could be associated with infrastructures in real life (nursing practice). Moreover, Morley (2012) finds that nursing students experienced a wiki as a useful communication tool that gave them the opportunity to engage in academic discussion. Furthermore, Rasmussen (2013) finds that wikis are useful for enhancing collaborative learning in medical studies. These interpretations can be connected to sociocultural theory's central elements.

Learning studies have presented learning as processes inside the head of each individual and free of social impact. In recent years, however, such theories have been challenged by sociocultural and other theories. In its depiction of learning processes, sociocultural theory has three characteristics (Wittek 2012, pp. 18–19). First, knowledge acquisition cannot be seen as detached from the current context in which knowledge is developed. This is referred to as situated learning. The positive evaluation of wiki use in a social science module in nurse education can be interpreted as indicating respondents' perception of the learning activity as relevant and meaningful to future nursing practice.

Second, sociocultural theory underlines that knowledge cannot be perceived as something individuals carry with them; instead, it must be seen as something that is socially distributed and that develops between people through communication and interaction. A wiki was defined above as a publishing tool that allows collaboration and writing amongst many people (Fossland, 2015, p. 150). The positive evaluation by nurse students could therefore be related to their better achievement of knowledge through group discussion than alone.

Evidence-based nursing and patient safety are central elements in nursing practice. The positive results connected to the evaluation of the wiki could therefore be interpreted to suggest that students see the importance of the knowledge achieved together. According to sociocultural theory, learning is a process where one participates in a social community learning to use and master specific tools and practices. This is referred to as cultural communities (Wittek, 2012). According to sociocultural theory (Säljö, 2001) a wiki is a mediating artefact that encourages collective activity and communication. The results can therefore be understood as showing that wiki-based learning gives meaning because nursing as a profession demands more collaboration skills than many other professions do and stresses an increasing use of advanced technology.

The relevance of students' ages regarding the evaluation of the wiki in relation to academic interest and student collaboration in groups

This study indicated that a higher proportion of the older students evaluated both the academic interest and collaboration as largely positive compared to the younger students (Figure 1 and 2). Prensky (2001) argues that younger students are 'digital natives' and have a different assessment of digital media than older students. However, the results of this study indicated that this was not the case for the student group examined here. In this study, the older students had more positive perceptions of digital media than the younger ones. However, this could also indicate younger students being more critical of the technology.

In Broady, Chan and Caputi's (2010) overview of the literature, older students are in an equally good position to learn digital skills as younger students are – the only difference is that they learn later. The results in Figure 1 confirm that the older students tended to have more positive attitudes towards the wiki as a digital learning tool than the younger students did.

The study by Morley (2012) shows that students in the early stages of studies underwent a major change regarding their approach to learning along a continuum from pedagogy to andragogy. All of the students examined in the sample were in their first year of study, and

the sample included both older and younger students. Older students may be able to exploit their experience when using a wiki as a digital learning tool; this is reported in a study by Fleming, McKee and Huntley-Moore (2011), who conclude that older students had a more active learning style than younger ones. Knowles et al. (1998) also argue that adult learners are more autonomous in their learning processes and that they build on earlier experiences. Adult learners learn in different ways and control their learning to a greater extent. They use their experience to facilitate their learning and have an internal rather than external motivation for learning. Such an andragogical approach is interesting in relation to the results of this study and may explain why a lower proportion of younger students were largely positive in their evaluation of the use of wiki technology compared to older students. This may also provide an explanation for why they considered the academic interest to be lower than the older students did.

Knowles et al. (1998) argue that the learner's experience is the most important resource for adult learning. Thus, it is conceivable that the older students' previous participation in working life and experience of interaction means that they recognise the value of interaction skills through the use of wikis.

Using wikis is considered to be a democratic and student-centred teaching method (Loeng, 2009). This may explain why the older students consistently gave a more positive evaluation of the wiki and the academic interest. The older students may have been attracted by the democratic and student-friendly teaching methods that the use of wiki offers because they had more experience with social participation and influence through voting and workplace involvement. In their study, Horgen and Nordseth (2009) report that students found it motivating to interact using a wiki and participate in their learning process in a more active way. Thus, wikis provide an opportunity for older students to utilise their scope of experience in the learning processes that are developed in a course of studies. As Tømte and Olsen (2013) show, online students often carried out their studies following a strict routine and were more self-disciplined than campus students; this was also confirmed in a study by Selwyn (2011). It seems that wikis provide opportunities to facilitate academic interests. Moreover, it appears that these opportunities are exploited to a greater extent by older students because they have the following qualities: an active learning style, internal motivation and self-discipline, and the ability to link learning processes to future competence.

The results of the survey indicate that the wiki is a learning tool that provides further academic interest for older students compared to their younger counterparts. Older students also evaluate wikis more positively as a tool in relation to studies. As Ciesielka's (2008) study shows, the use of a wiki creates an infrastructure similar to interactions in real life; thus, it becomes a useful form of communication with opportunities for academic discussions and learning. In this study, this phenomenon seemed to apply more to the older students than the younger ones.

The results demonstrated that with increasing satisfaction with collaboration using wikis, the percentage of students with a positive attitude to the academic interest rose (Figure 2). According to Horgen and Nordseth (2009), wikis encourage students to become active contributors rather than passive consumers.

Methodological considerations

Data quality can be measured in terms of the study's validity and reliability. This study had a response rate of 76%, which is considered good. The study's reliability was ensured by measuring the Cronbach's alpha and determining the significance level. What constitutes an adequate alpha value is disputed, but it should be above 0.7 according to Tavakol and Dennick (2011a). Cronbach's alpha was strong for one (0.84) of the indices and close to 0.7 (0.68) for the other. The validity of the survey is considered satisfactory, since the data collected were good and suitable in relation to what they are intended to measure (Grønmo, 2004). The construct validity of the two summary indices was supported by the pattern of factor loadings, with factor loadings above 0.56 for each constituent item on the designated component, and with absolute differences averaging 0.52 between factor loadings for the designated component and the second 'competing' component. If factor scores had been retained instead, near-identical results would have emerged, since they correlated with the 'academic interest' and 'collaboration' indices at 0.99 and 0.98, respectively.

A weakness of the study was the paucity of background variables. Questions related to previous study experience, expectations of the study programme and so on could also have been included in the questionnaire. The questionnaires were distributed after completion of coursework requirements; consequently, we cannot ignore the fact that some respondents may have perceived that answering the questionnaire was mandatory.

CONCLUSION

The study showed that the student sample was rather positive in its assessment of the use of wiki technology. Differences in assessment were related to the students' ages. Older students seemed to be more satisfied with the academic interest, the collaborative way of working and the use of wiki technology than the younger ones did. Few of the nursing students had previous experience with the use of wiki technology, blogging or Twitter. The study presents how the use of wiki technology in a bachelor's programme in nursing is a useful educational resource, and it was received positively by students. The study showed that wikis can represent an educational resource that contributes to boosting collaboration skills and academic interest. It also generated knowledge about the relationship between age and the use of wiki technology; this should be investigated further in future studies and with different groups of students.

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