Using wikis to improve students’ learning

Wikis are websites that use software to create and edit any number of interconnected web pages. Tom Lyons wondered if his students’ understanding would improve if they used wikis as part of their AS studies. Here he reports on the outcome of his research project.

Aim

The aim of this action research project was to see if using wikis with my AS physics groups would improve their understanding of concepts within the course, and improve the way in which they learnt these concepts. In order to be able to write content for the wiki, students require a deep understanding of the topic they are writing about — something which tends to be true only for a minority of students. The level of understanding of the material that they include would hopefully be deeper than if they had simply revised from class notes or another study guide, and they would need to think critically about the content that they chose to include. The primary task set for the students would involve writing their own study guide for the course. The wiki would also act as a shared resource — a valuable pool of knowledge. Other possible benefits could include increased collaboration between students, improved writing and presentation skills and a sense of pride and satisfaction in creating the wiki.

Who was involved?

The study focussed on two classes taking AS physics. The students were all 16 or 17 years old, with a male to female ratio of about 7:1. I taught both classes for the duration of the study.

Why use wikis in teaching?

Duffy and Bruns (2006) list the following educational uses for a wiki:

- Students can use a wiki to develop research projects, with the wiki acting as ongoing documentation of their work.
- Wikis can be used for students to add summaries of their thoughts from the prescribed readings, building a collaborative annotated bibliography.
- In distance learning environments, the tutor can publish course resources like syllabus and handouts, and students can edit and comment on these directly (for all to see).
- Wikis can be used as a knowledge base for teachers, enabling them to share reflections and thoughts regarding teaching practices and allowing for versioning and documentation...
- Wikis can be used to map concepts: they are useful for brainstorming, and authoring a wiki on a given topic produces a linked network of resources.
- A wiki can be used to facilitate a presentation in place of conventional software, like Keynote and PowerPoint, and (given a suitable working environment) students are able to directly comment on and revise the presentation while it takes place.
Wiki sites are tools for group authoring: often groups collaborate on a document by sending it on to each member of the group in turn, emailing a file that each person edits on their computer, and some attempt is then made to coordinate the edits so that everyone’s work is equally represented; using a wiki pulls the group members together and enables them to build and edit the document on a central wiki page.

These ideas outline ways in which wikis can be used as a tool to allow easy collaboration and as a way of presenting information. Perhaps more important to students’ learning is the process of contributing and editing information on a wiki. Bloom’s taxonomy identifies a hierarchy of educational objectives:

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

(Atherton, 2009)

To include information on a wiki that is not just copied from elsewhere, a student not only needs to understand that information but they have to be able to analyse it (the fourth level in Bloom’s taxonomy) so that they can confidently include new information on the site. Editing the content of a wiki requires the student to assess the current content and make a decision to improve upon it, which requires Bloom’s highest level, evaluation.

Methods used

The wiki site

I decided to use a ‘private wiki’ on a Wetpaint site (www.wetpaint.com) for this project. I chose Wetpaint because they had a WYSIWYG (What You See Is What You Get) format and they had an education section which allowed all adverts to be removed from the site.

The site was hosted externally but was only viewable by those invited to join the site. In this way, only me and the two groups involved could access and edit the site.

Questionnaires

Two main questionnaires were used during the project: the first addressed to the students from the two teaching groups; and the second addressed to teaching staff within The Sixth Form College Farnborough.

Informal questioning

I was able to make some assessment of the attitudes of the students towards the wiki through informal questioning and sometimes by listening to comments they made about the wiki to one another.

Findings

The first task

The classes were divided up into groups of 3 or 4 to generate some revision notes for a section of the course. Each group had an assigned leader, who was tasked with making sure that the topic allocated to the group was properly addressed, and they also had the responsibility of adding the content to the wiki site. The groups were given about 40 minutes to complete the activity, and most students engaged well in the task. After
one week, 5 out of the 8 leaders had posted the information on the site. An example wiki page from this task is given in Figure 1.

The student questionnaire

A couple of weeks after the first task had been completed, the following questionnaire was given to the 35 students.

1. Have you registered on the wiki site?
2. Have you posted anything on the site?
3. Did you know the idea of the site was for you to create your own study guide and/or ask and answer questions about the course and physics in general?
4. Do you think there is currently any benefit to using the site?
5. Did you find the group exercise to produce revision material for the site was useful?
6. Do you think the inclusion of revision material in the study guide section has encouraged you to look at the site?
7. Would you encouraged to use the site if there were more discussions about physics topics?
8. What, if anything, would encourage you to use the wiki site?

The responses for questions 1 to 7 are summarised in Table 1.

Table 1 Responses to student questionnaire

<table>
<thead>
<tr>
<th>Questions</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you registered on the wiki site?</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>2. Have you posted anything on the site?</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>3. Did you know the idea of the site was for you to create your own study guide and/or ask and answer questions about the course and physics in general?</td>
<td>32</td>
<td>3</td>
</tr>
<tr>
<td>4. Do you think there is currently any benefit to using the site?</td>
<td>26</td>
<td>9</td>
</tr>
<tr>
<td>5. Did you find the group exercise to produce revision material for the site was useful?</td>
<td>26</td>
<td>9</td>
</tr>
<tr>
<td>6. Do you think the inclusion of revision material in the study guide section has encouraged you to look at the site?</td>
<td>24</td>
<td>11</td>
</tr>
<tr>
<td>7. Would you encouraged to use the site if there were more discussions about physics topics?</td>
<td>24</td>
<td>11</td>
</tr>
</tbody>
</table>

The results show that less than a third of the students surveyed had posted anything on the wiki site, at that time. The majority of students thought that the activity to produce the revision material for the site
was useful and encouraged them to use the site more.

Question 8 was open ended question, asking students for their views. Their answers included:

- Nothing new as the site will become more developed over time
- Videos
- Things for tests helpful hints, etc.
- Maybe include putting things on to the site as part of private study
- More teacher generated content as students could be wrong
- Maybe include more notes on subjects covered in class
- More revision guides
- Sample exam questions and how to answer them
- If it had been running for longer rather than just starting out

Second activity

The first activity was repeated for a different section of the course, but this time only with one of the classes. The students were still very slow at posting information on the site afterwards. After a test on this section of the course, I compared the average test scores of the two groups. There was no significant difference between the groups for tests after activity one or activity two.

Third activity

This activity involved creating a glossary of terms for a section of the course (see Figure 2).

Each student was given one or two terms that they had to write a definition for and post it on the wiki page, as part of their private study. This enabled me to look at what proportion of students would complete an individual task using the wiki. On the date of the deadline for the private study, a third of the students had posted information on the site. The biggest issue from the students’ point of view was that they had either forgotten their login or did not know how to use the site.

Is the wiki being used for revision?

In a quick poll, after their January module, only three students said that they had used the wiki for revision. This compares to 25 students using the AS level CGP revision guide.

Figure 2  Glossary of terms written by students
The staff questionnaire

A second strand in my research looked at staff perceptions and interest in wikis.

I conducted a survey of teaching staff and had 135 responses. Around a quarter said that they had used wiki sites in their teaching. On further questioning, only three respondents said that their classes had posted content to a wiki site as part of class activity. Two members of staff had used the wiki within the virtual learning environment, Moodle (www.moodle.org). The other member of staff used wiki pages within history lessons to look at fear in the Nazi state. She said:

…time and access to computers are a problem. Students need prompting/standing over in my experience – expecting them to do it in their own time and independently has patchy results. I have no lessons this year in classrooms with computers.

When asked, ‘If you were given training in the use of a wiki site would you be interested in using wikis with your classes for any of the following?’ staff were most interested in using wikis as discussion forums (see Figure 3 for full results).

The questionnaire also showed that the main concerns in the use of wikis are their accuracy and reliability and the possible misuse of the site.

On a positive note, 68% of the staff surveyed wanted to find out more about using wikis in education, and 62% expressed an interest in attending a workshop on wikis.

Discussion

Lessons learned

In the introduction, I touched on the idea of Bloom’s taxonomy in relation to wikis. In the tasks set, the students engaged in analysis of information, the fourth level in Bloom’s classification, to enable them to generate content for the site. Working in groups enabled detailed notes to be produced, which could be shared with the rest of the class when posted on the wiki site. However, the real beauty of wikis is that the information included can be updated, improved and refined. To make the jump to Bloom’s highest level, the students have to have the confidence to change or add to information already posted on the site.

Figure 3 Staff questionnaire results
It is clear that structured activities, that enable the students to input the content during the lesson, are needed to effectively engage students in the wiki. The idea of the wiki and the tasks set were generally welcomed by the students but work must be done to enable the students to see a benefit to posting new material on the site. It is, perhaps, difficult for students to see that the main benefit of contributing to a wiki site may be the act of contributing itself. The content in which they have the deepest understanding will surely be that which they have written themselves. Where they did engage in activities to generate content for the site, the majority of students found it useful, but very few took the next step of using the site as a resource afterwards. A comment made by one member of the staff in their questionnaire is very apt:

*If this wiki site use is integrated into lesson delivery, students will be more inclined to see it as a supportive tool, rather than an additional task.*

**Will wikis work for us?**

The most striking result from the staff survey is that so many of us are interested in the possibilities for their use. There are many possible uses of a wiki, from a one-stop shop for course information and documents, to a site for free discussion. The technology is no more difficult to grasp than e-mail and word-processing; and if integrated into a virtual learning environment, such as Moodle, teachers and students can use a system that is consistent across subject areas.

Concerns about accuracy and reliability are important. Students should feel confident that the information on their wiki is not incorrect. Of course, students can moderate their peers’ contributions but it may be that it is a requirement of the teacher to check that information posted is correct, if not necessarily complete. Incorrect information on the site can actually be used as a discussion point in class, as long as this does not discourange students from posting contributions.

Concerns about abuse or misuse of a wiki site are also important to consider. However, students are unlikely to post inappropriate content on the site, once they are aware that you can check who posted what and that you do check the site regularly.

**Conclusion and tips for teachers**

There were some issues that affected how the students viewed and used the wiki site:

- There was no session booked in a computer room at the beginning of the year for the students to become familiar with logging in and using the software. This meant that some lacked the confidence to use it for the tasks set.
- For the many students, there was little perceived benefit for them to use the site. Why write revision material when there is a perfectly good revision guide that they can buy?
- Fear of being wrong. Many students were concerned that if they posted information on the site that it might be incorrect.
- Many of the students saw the wiki as ‘Tom’s thing’ and not theirs.

If I were to run the wiki site again with new groups of students then I would want immediate access to networked computers so that input to the site would be regular and in class time. I would also incorporate some dedicated lessons, using the wiki, in to the schedule for the year. I would hope that with more structured input, the students would begin to take ownership of the site.
and see the benefit of the site as a shared resource. I may also introduce a tick box on the each page to show it was ‘teacher checked’ so that students were not concerned that the content was incorrect.

Where do I go from here?

I plan to run some workshops for staff on wikis and set up a staff wiki to share ideas. I have set up a newsletter wiki page for staff and students within the physics department which we trial run next year. I plan to look at other Web 2.0 tools, such as video-casting and twittering to see how they could be used in teaching.

References


About the author

I have been teaching A-level physics and electronics at Farnborough Sixth Form College, Hampshire, for four years. Before teaching, I spent four years as a satellite systems engineer, mostly working on the European Space Agency projects. I am also writing a book answering children’s questions on science and putting together some instructional videos on using Moodle (a virtual learning environment).

Contact details

Tom Lyons
T Lyons@Farnboroughsfc.ac.uk

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