Using wikis to encourage collaborative writing and learning

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Abstract
In this paper we report an online collaborative writing approach to the teaching of applied psychology on an MSc in Human-Computer Interaction with Ergonomics. We describe the offline, paper-based version of this activity and discuss the benefits of moving to an online wiki version.

Introduction
The Applied Cognitive Science (ACS) module on the MSc in Human-Computer Interaction with Ergonomics at University College London module consists of a series of lectures and lab classes that aim to give students an understanding of the human part of HCI. We focus on cognitive processes, covering topics such as visual perception and visual attention and demonstrate what these theories can offer when we're designing interfaces or trying to understand or predict human behaviour with computer systems. The module is assessed by an exam that requires students to write essays describing cognitive theory and explaining how it can be used to provide guidelines for design or to predict or explain human behaviour with a particular interactive system.

Many of the students find the theoretical content of the module difficult and have little experience of being

assessed in this way. A significant proportion of our students come from a computer science background and this course is perhaps their first exposure to psychology. It is challenging for them to learn and understand the psychological theories as well as be able to apply them to HCI situations. It is therefore important that they engage actively with the material throughout the module rather than simply attending lectures and hoping it all comes together when they revise prior to the exam.

In 2008, Thimbleby published his chapter "Write Now!" [5] which aims to explain to students the many benefits of writing as a means for learning. Until you begin writing, how do you know what you should be reading about? Until you try to write about something, it's also difficult to know what you understand well, and what you still find difficult to articulate. Thimbleby encourages students to begin their writing early and not to be afraid to ask for feedback, even if they are sure that they have failed to do a good job of their writing. In this paper, we describe activities we have used in our teaching of ACS, that aim to engage students to view and partake in writing as a means for active learning, rather than only for assessment purposes.

Our first writing activity

In around 2004 we devised a writing activity for the students on the Applied Cognitive Science module.

In order to structure the writing activity we created a contents page for a fictional course text book and gave students the opportunity to sign up for a section of their choice. Many students took this opportunity and submitted their writing for formative feedback from the tutor. Students had the option of signing a permission sheet for their writing to be collated with those of other students, and with our contents page, in order to produce a revision guide which was given out to all those who had contributed.

The students were highly motivated to produce work of good quality and we therefore used this model for a number of years. Every year we added the new contributions to "the book" and circulated it to those from the new cohort who had contributed. Over the coming years it grew into a sizeable document. As the content of the course was updated, new chapters were written, and older ones were given less attention.

There have been previous efforts to produce student-written course notes on HCI courses. For example, Shneiderman had students on his Advanced Usability course produce a website about research methods for HCI during the course of the module. Their writing can be viewed at: http://otal.umd.edu/hci-rm/index.html

The potential for publication

University College London has a history of engaging students in novel writing tasks during their studies. In 2007, Hasok Chang and Catherine Jackson edited a book [2] based on research by undergraduate students titled "An Element of Controversy: The Life of Chlorine in Science, Medicine, Technology and War" which is now available for purchase via well-known online book retailers. Chang's idea was to structure an entire undergraduate module around research topics that were chosen by the students, and to engage them in writing about their discoveries. Their writing was passed on to successive cohorts of students who

improved and built upon what they read, until they had produced something of publishable quality.

We discussed with the students the possibility of publishing the text as a course book. Although we have yet to find the time to engage in this, we believe that the possibility of publishing their writing served as an additional motivator for the students.

However, although next year's cohort might be very happy if we were to do this we are cautious about this approach. Much of the benefit to the students of this activity comes from their involvement with the writing. Just giving them the efforts from a previous cohort wouldn't produce the same learning effects. However, should the curriculum change sufficiently so that the previously written chapters are no longer the central themes of the module, this may be an interesting activity.

Bringing our writing activity into the 21st century

Although the 'paper-based' task had worked well in previous years, the structure of the task afforded limited opportunity for discussion, criticism and reflection. We hoped that several of the features offered by the use of a wiki would improve learning outcomes and overall student experience. In addition, we thought that the use of a wiki might facilitate the publication of an e-book.

Although wikis have been used extensively for collaborative writing, this success has not always transferred into university-level teaching. Cole [3] describes using a wiki to improve student engagement on an undergraduate informatics course. Like the wiki described in this paper, Cole used a wiki as a "module-level knowledge repository". Unfortunately, the wiki was ineffective in improving student engagement primarily because students were confused about how to use the wiki, and what they needed to do once they were able to use it. Large proportions of students also cited time constraints and a lack of interest as reasons for not participating. Karasavvidis [4] reports a similar attempt to introduce a wiki into the teaching of a course. To reduce the likelihood of non-participation, engaging with the wiki was made part of the student assessment. Once again, the effort to introduce a wiki was something of a failure because students lacked the "knowledge, attitude, skills, and strategies" to handle the task effectively. In particular, students showed an unwillingness to engage in truly collaborative writing by making revisions to work that other students had produced.

Avoiding potential pitfalls

Our experience with introducing the wiki has been quite different to that of Cole, Karasavvidis, and others who have run into problems with using wikis in teaching. We attribute our success to a number of factors, some of which resulted from planned interventions and some of which were happy coincidences.

Choosing and installing a wiki was the first challenge we faced. Initially we'd hoped to make use of the built-in wiki functionality that comes with our Virtual Learning Environment, Moodle, because Moodle has supported the course for a number of years. However, the version of Moodle used to administer courses was fairly old and the built-in wiki functionality was not sufficiently developed for our purposes. Given our plan to produce an eBook at the end of the course it was

important that the wiki we used had clean mark-up and an easy-to-use change tracking system. It also needed to integrate seamlessly with the existing college single sign-on systems that were in place. We were offered the use of space in an existing College wiki system. This seemed to meet most of our requirements and had minimal set-up cost.

The second challenge we pre-empted was that students might be intimidated by the idea of writing something of publishable quality. Therefore, before students had access to the wiki system, one of the moderators produced an exemplar article. This exemplar was intended both to give students an idea of the style of writing they needed to adopt, but perhaps more importantly it gave students a model that they could use to structure their writing, both at a high level (e.g. sections, subsection) and at a low level (e.g. intra-article hyperlinks, citations, images). A number of the students re-used snippets of mark-up from the exemplar when producing their own document, so this seems to have been successful.

In an attempt to avoid the editing impasse that has hindered previous attempt to implement wikis, we established an explicit hierarchy and procedure for editing the work of others. At the start of module, students were asked to sign up to write the first draft of the required sections. We agreed that the first draft of each chapter had to be completed within two weeks of the associated class, after which, we expected all other students to review, edit and comment on the submitted draft. If students found something they disagreed with, or felt could have been expressed better, they posted a comment on the article outlining what problems they perceived with the article and suggested which changes they would make. A wiki moderator evaluated the claims and made a decision about whether the criticisms were valid and what might be done to improve the article. This method was used to minimise the potential for 'edit wars' in which editors engage in a futile cycle of edit and counter-edit. So far criticism has been constructive. Based on our experience to date, we believed that the system we have in place provides a balance between healthy debate and protecting less assertive students.

We also hoped to encourage less confident students to make edits by using a wiki system that supported easy versioning. We encouraged students to make 'experimental' modifications to the articles, including the structure that had been suggested. If edits were subsequently found to be unsatisfactory, they could be recovered without any work being lost.

One of the things that previous studies have documented is a lack of student enthusiasm. Undergraduate students' academic goals are not necessarily well aligned with a wiki-based task. Unlike most previous studies, this exercise was set for students studying for an MSc. Although students were strongly encouraged to participate, there were no formal sanctions for students who chose not to participate. At the time of writing, we are about half way through the module. Students who nominated themselves to write-up lectures that have not yet taken place have not yet made contributions. However, students who volunteered to contribute to one of the topics taught early in the module have made good progress with their contributions. The most actively edited page has almost 9,000 words and is now on revision 144. Encouragingly, these edits are fairly

evenly distributed between the students responsible for the article. Of course, there is a potential confound in that eager students are more likely to sign up for the earlier chapters – it will be interesting to see if this level of activity is sustained over the course of the module.

The wiki system we used offered WYSIWYG editing, but many of the features required editing of proprietary mark-up. Mindful of the barrier to participation that mark-ups create, instructions were given to students about how to use the wiki's major features. Also, the moderator had the skills to guide students through issues and problems they faced when dealing with the technical implementation of the articles.

Benefits for Teaching of HCI

Whilst much of HCI teaching lends itself to practical activities that themselves can be assessed, some topics are very academic and are therefore appropriately assessed via traditional methods such as essay writing under exam conditions. The study of individual human behaviour with computers is one of these domains. However, many of the students who choose to study HCI at post-graduate level have not studied human sciences where these forms of assessment are more common. Our approach to encouraging students to engage in a formative collaborative writing activity on a wiki offers a number of benefits over traditional paper-based techniques. The wiki encourages students to work hard to integrate their contributions to create a high quality document. Students are able manage this integration because they can comment on the style and the accuracy of contributions via the discussion tools.

General Discussion

In this short paper, we have outlined our approach to engaging students in challenging material via a collaborative writing activity. We have focused on how engaging students in writing a wiki revision guide has enhanced their learning experience. We have also commented on how students have used the online discussion facility within the wiki to support their writing and editing activities.

We would like to give some attention to the idea of publishing the outputs of this activity as an e-book. In order to ensure we can continue to run this activity for future cohorts of students on this module, and that it be sufficiently motivating for them, we need to consider how we can structure the module in future years in order to continue to require the writing of additional chapters. This is likely to require new lectures and themes to be included in the module each year. One possibility might be to take inspiration from the module run by Chang [2]. It may be possible to maintain a core set of topics in the module while also offering one or two additional topics that change each year. These new topics would be researched and written by the new cohort students. The exam paper could be structured so that the new topic each year always appears on the exam paper, and thereby ensure constructive alignment of learning topics and activities with assessment as suggested by Biggs [1]. Thankfully, the amount of research from the field of Cognitive Science that has useful and interesting contributions to make to HCI continues to grow, and therefore we will never be short of topics to include.

References

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