CoursePedia for Engineering Courses

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Abstract

This work-in-progress (WIP) activity explores the potential of a supplementary student resource that involves setting up an online conglomeration of current and applicable topics for a course from the latest journals and publications to which students contribute, edit, and update as part of their class assignments and other course deliverables. The supplementary student resource described above was implemented in two engineering courses; the paper discusses: detailed implementation, pedagogical approach, and results of the measures taken to evaluate and assess the student benefits.

I. Introduction

Commercial publishing of textbooks is often a lengthy process. After the author decides on a topic of expertise, a thorough analysis of journals and conference proceedings pertaining to the topic is conducted and the author then elaborates on the findings published therein. This takes anywhere from 12 – 24 months based on the pace at which they work. After the book manuscript is complete it takes an additional 18 to 24 months before the actual book hits the shelves. Because of this time consuming process, even though the book contains findings from well noted and cited publications, the findings are now at least 2- 3 years old. Instead of having students use just texts that contain research findings that are already 2 – 3 years old, why not let them progressively built their subject knowledge from the latest journals and publications directly?

II. Instructional Development - *CoursePedia* for Engineering Courses

The potential of a supplementary student resource, that involves setting up an online conglomeration of current and applicable topics for a course from the latest journals and publications to which students contribute, edit, and update as part of their class assignments and other course deliverables, is explored.

For the following discussion, *EGCP 281(Designing with VHDL)* course in the Computer Engineering program at California State University, Fullerton is used as an example. However, the proposed methodology for instruction development can be applied to other courses in engineering as well.

(a) Implementation Process

1) As and when topics are covered during the course of a semester, the instructor for *EGCP 281* course assigns a project that involves a literature review on a particular course topic as part of homework, mid-terms, or final. Once students decide on a topic for the assignment approved by the instructor, they conduct a thorough review of the latest publications utilizing the online resources of the university library such as the IEEE Xplore and submit a formal report with relevant references.

2) The instructor for *EGCP 281* course would then compile and link these reports to the course webpage, which in turn is linked to the ECS *CoursePedia*, the online encyclopedia for *College of Engineering and Computer Science* (ECS).

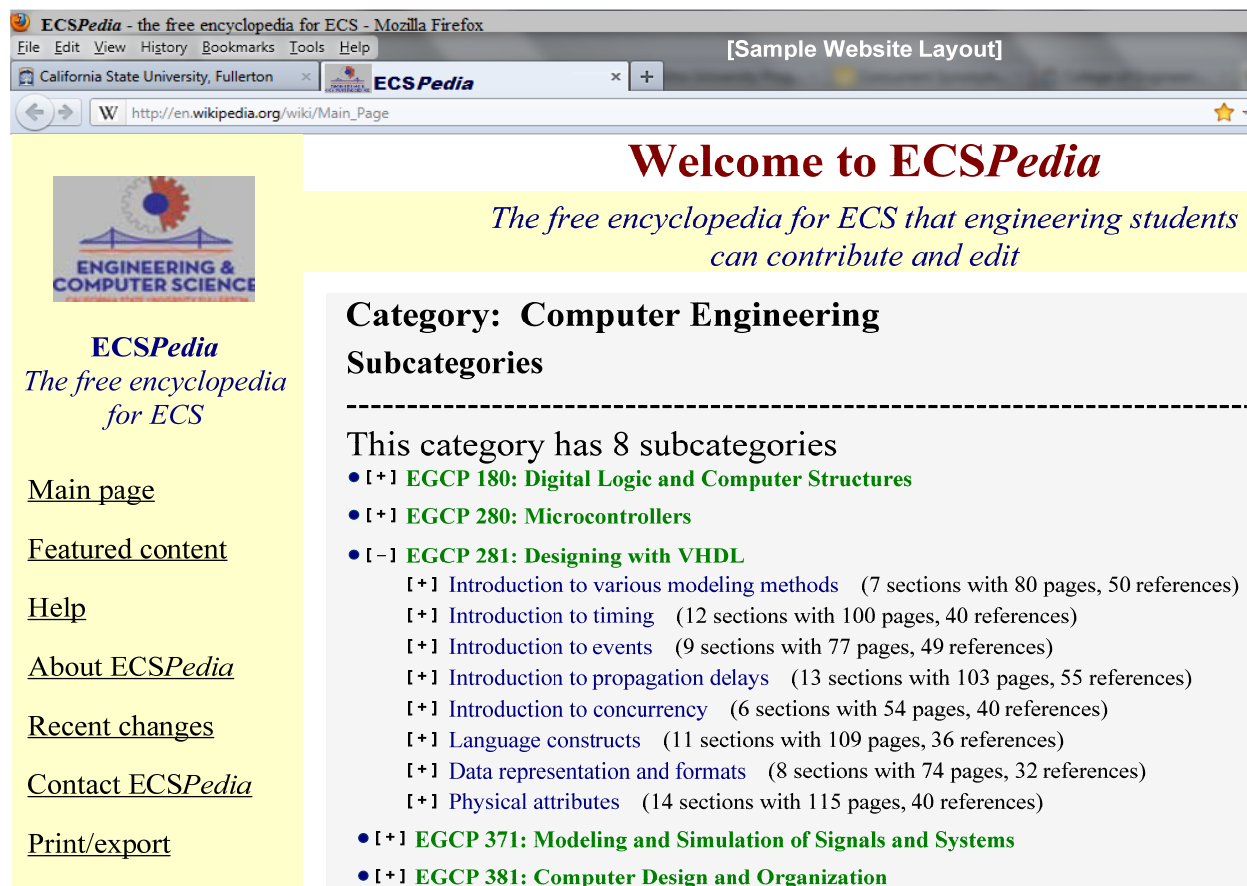A sample website layout to illustrate the above described concept is shown below.

Fig. 1. Sample website layout for *CoursePedia* activity

3) As all instructors teaching *EGCP 281* course continue the process as described in step 1 and 2 every semester, the information listed on the course webpage is constantly edited and updated by students with its contents remaining current as it includes data from the latest peer-reviewed publications in the field.

III. *CoursePedia* Implementation, Student Feedback and Analysis (Spring 2011 and Fall 2012)

(a) Implementation

The supplementary student resource described above, *CoursePedia*, was adopted in engineering courses to ascertain its effectiveness. In Spring 2012, students in EGCP 441 course – *Advanced Electronics for Computer Engineering* (total enrollment: 11, one section) were asked to submit a research paper on topics in nanoelectronic technologies as part of the final exam for the course. For the paper, students were asked to conduct a thorough review of the latest publications utilizing resources such as the IEEE Xplore and submit the paper with relevant references. In Fall 2012, students in EGCP 456 course – *Introduction to Logic Design in Nanotechnology* (total enrollment: 16, one section) were provided with the papers on nanoelectronic technologies submitted by students from EGCP 441 class (Spring 2012) and were asked to edit and update them with the latest findings as part of their final exam for the course. Papers from the previous batch of students provided the current batch a better starting point for their research on the assigned topic. Reports submitted from the Fall 2012 EGCP 456 batch will next be utilized by students in Spring 2013 EGCP 441 course.

Using the above described student centered activity, it is anticipated that the assimilated information content will not only serve as a supplementary resource, but one that is superior in every respect as the subject matter is current with findings reported in the latest journals and publications . As the contributions are from students themselves it facilitates better comprehension and increased retention.
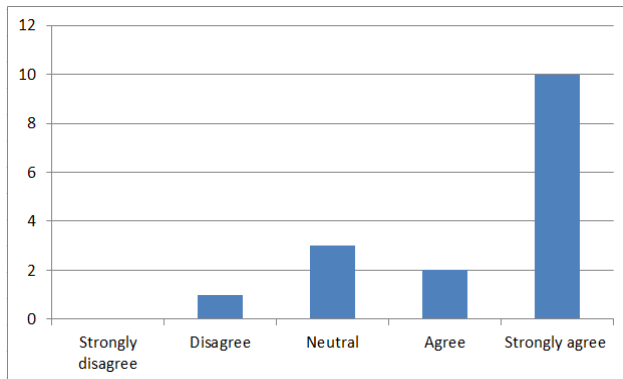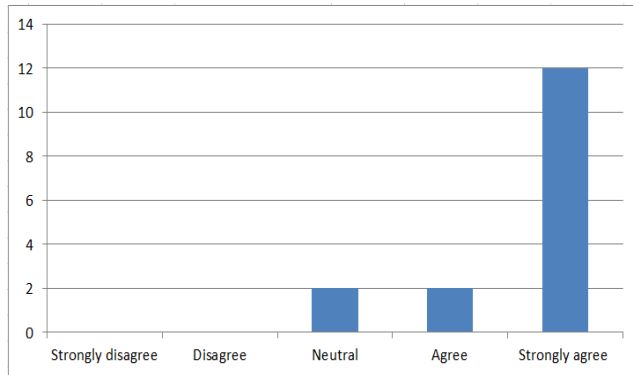

"The research papers from your peers provided a better understanding of the topic that was assigned to you as part of the final for EGCP 456 course"

Fig. 2(a): Student survey question 1
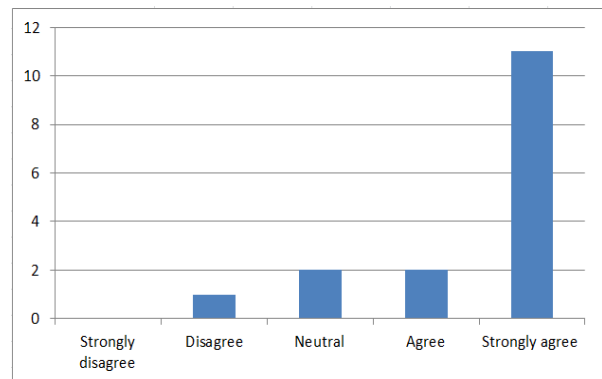
"The research papers from your peers provided a better starting point for the research on your topic that was assigned to you as part of the final for EGCP 456 course"

Fig. 2(b): Student survey question 2

"Research papers progressively edited and updated by peers each semester can increase your knowledge of the subject matter as it is more current"

Fig. 2(c): Student survey question 3

(b) Student Feedback and Analysis

A student survey was constructed to measure students' perceptions of the *CoursePedia* activity in Fall 2012 EGCP 456 class. The survey included three questions with responses: strongly disagree, disagree, neutral, agree, and strongly agree along with a question with free-response answer.

Figure 2(a) summarizes the student response to the first question in survey, "*The research papers from your peers provided a better understanding of the topic that was assigned to you as part of the final for EGCP 456 course.*" Approximately 75% of the students agree that their understanding of the assigned topic on nanoelectronics was improved. Figure 2(b) summarizes the student response to the second question in survey, "*The research papers from your peers provided a better starting point for the research on your topic that was assigned to you as part of the final for EGCP 456 course.*" Approximately 81% of the students agree that the research papers from their peers helped them quickly grasp the concept compared to traditional resources such as journals. Figure 2(c) summarizes the student response to the third question in survey, "*Research papers progressively edited and updated by peers each semester can increase your knowledge of the subject matter as it is more current.*" Approximately 88% students believed that research papers that are progressively edited and updated can serve as a good supplementary resource that can increase their knowledge of the subject matter as it contains the latest findings reported in the latest journals and publications. Some of the student inputs to the free-response question "*What suggestions do you have for improving the CoursePedia in the future?*" were as follows:

- "*I thought that the CoursePedia was really helpful. It helped me better understand my topic and overall got a better knowledge of the topic.*"

- "*Great tool for learning.*"

- "*An archive database of the various updates done year after year would greatly enhance the understanding on the progression and growth of the particular technology researched.*"

- "*Some topics in selection did not seem to show improvement over the last year or didn't make it public which made it somewhat difficult to come up with new information.*"

- "*I don't think there are any significant improvements that can be made. It is very straightforward. We simply take a paper written by a previous student, and update it with more up-to-date information.*"

- "*The only problem I had was, I was unable to find some of the previous reports information. The other person may have had more classes already but I couldn't "verify" his information which made it a little more of a challenge.*"

Author plans to incorporate the constructive suggestions from students and modify instructions for the *CoursePedia* assignment including:

- Providing students with an exhaustive database and resources that they can use to search for the latest findings on the topics assigned to them;
- Providing students strict format guidelines including referencing.

III. Conclusion

A supplementary student resource, *CoursePedia*, that involves setting up an online conglomeration of current and applicable topics for a course from the latest journals and publications to which students contribute, edit, and update as part of their class assignments and other course deliverables was presented. It is anticipated that *CoursePedia* will not only serve as a supplementary resource, but one that is superior in every respect as the subject matter is current with findings reported in the latest journals and publications . As the contributions are from students themselves it facilitates better comprehension and increased retention. Implementation, student feedback and analysis of *CoursePedia,* which was adopted in two engineering courses to ascertain its effectiveness, were also discussed. The analysis of the student feedback showed that the supplementary student resource *CoursePedia* was effective in improving the student learning process. However, classes of larger sizes are needed in the future to further study its effectiveness.