

Designing Course Management System into CSCL Tools: Experience with Moodle

Jingyan Lu, Nancy Law, Faculty of Education, Pokfulam Road, The University of Hong Kong, Hong Kong
Email: jingyan@hku.hk, nlaw@hku.hk

Abstract: Course management systems (CMSs) were originally designed for teachers to manage their teaching, little interest has been directed at students' learning. Moodle is a CMS. This study investigates two features, wiki and assessment tools embedded in the Moodle system as to how they are designed to support project based learning. The effects of wiki-supported collaboration, peer grading and feedback on junior secondary students' enquiry on liberal studies are analyzed using multiple regression.

Introduction

As teachers increasingly use Course Management Systems (CMSs) to design more hybrid learning activities, students engage in more online learning. It is therefore of interest to investigate and identify patterns of students' online learning behaviors and to assess their impact on learning performance. Recent developments in the design of CMSs have expanded their scope and incorporated such principles. Moodle makes available many web-based applications, we will focus on two: wikis and peer assessment tools. We focused on investigating two student learning activities on Moodle: collaborative knowledge construction and peer assessment. We examined how students use wikis to co-construct knowledge and assessment tools to evaluate each other's work. Wikis allow incremental knowledge creation and enhancement (Cole, 2009), impose no pre-defined structures unlike blogs (Bryant, 2006) and are easy to use (Ebersbach, 2008). When learners evaluate each other's work, they increase their awareness of the criteria for quality work in a subject domain. As a result, they reflect on and become more attentive to applying these criteria to their own work. Web-based assessment tools were also found to facilitate learning by facilitating giving and receiving peer feedback (Tseng & Tsai, 2007) and helped students observe peers' writing, identify revisions, communicate with peers, reflect on and improve their own work (Yang, in press).

Methods and Results

One hundred and eighty-six students Secondary Two students in a local Hong Kong school participated in this study. Students were from five classes and were 13-14 years old. The students worked on a Liberal Studies (LS) project on Moodle. Moodle log files which included students editing their own wikis and those of peers, submitting grades and comments to each other across the five subtasks. Assessment tools provided multi-dimensional rubrics for each subtask. Students can choose a number grade in each level. They could also write feedback (Figure 1a). Wiki helped students construct knowledge individually and collaboratively (Figure 1b)



Figure 1: Screenshot of Peer Assessment (1a) and Wiki (1b).

Hierarchical multiple regression was used to examine the effects of online behavior of knowledge construction and peer evaluation on project performance (final project score). Data from 186 students (95 girls and 91 boys) was used in the analysis. Students on average gave more grades (mean = 13.10) than feedback (mean = 8.05) to peers. They also received more grades (mean = 13.80) than feedback (mean = 9.80) from peers. The multiple regression showed the number of comments to peers ($t = 2.8, p < .01$) and number of revisions on their own wiki ($t = 3.4, p < .01$) were significant predictors to their project scores, controlling for scores on Humanities and Computer Literacy. The number of revisions to peer's wiki had a borderline effect ($t = 1.9, p < .10$).

Discussion

Students in this study used wikis to develop individual projects, to work in small groups and to make additions to each other's work. Working on their own wikis and on those of peers were significantly correlated with final

project performance. Wikis were effective in getting students to work on their own projects. The more often students revised and updated their work, the better their final project grades. How often students collaborated on the wikis of peers had a significant effect on their own project. The results implied that CSCL environments should be designed to promote agency and collective cognitive responsibility. A certain level of agency determines the level of collective cognitive responsibility which in turn promotes higher levels of agency. Wikis as CSCL tools promotes higher levels of agency among users in managing their engagement with resources and peer users.

Online assessment includes giving and receiving grades and feedback. The more feedback learners provided to peers, the better their own project performance. A possible explanation could be that when learners assess peers, they engage in activities with different cognitive demands. It could be that by assessing the projects of peers, learners became more critical and effective as they develop a clearer understanding of the topic under review and the application of the assessment criteria, which in turn, have a great influence on their own work. Although, peer assessment is a well recognized and important pedagogy it is not regularly implemented because assigning peer work, asking for peer grading and feedback, and giving back peer assessment work in paper format is often difficult. Online assessment tools can simplify and operationalize peer assessment. Students are able to give comments and make them immediately available to peers.

This study implies that 1) while most learning technology emphasizes self-assessment and reflection, easy to use CSCL tools should also be designed for the CMC to facilitate peer assessment and reflection. 2) While wikis are commonly used to support collaborative learning and knowledge construction, peer assessment tools are seldom used in conjunction to support the learning process. The findings from this study indicate that when integrated into a CMS to support learning such tools can enhance the pedagogical value of wikis.

References

- Bryant, T. (2006). Social software in academia. *Educause Quarterly*, 29(2), 61-64.
- Cole, M. (2009). Using Wiki technology to support student engagement: Lessons from the trenches. *Computers & Education*, 52(1), 141-146.
- Ebersbach, A. (2008). *Wiki: Web collaboration* (2nd ed.). Berlin; New York: Springer.
- Tseng, S. C., & Tsai, C. C. (2007). On-line peer assessment and the role of the peer feedback: A study of high school computer course. *Computers & Education*, 49(4), 1161-1174.
- Yang, Y.-F. (in press). A reciprocal peer review system to support college students' writing. *British Journal of Educational Technology*.

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