

行政院國家科學委員會補助專題研究計畫成果報告

子計畫二：知識建構：以網路相互支援設計科學活動 為基礎(3/3)

NSC89-2520-S-009-013-

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計畫編號：NSC89-2520-S-009-013-

執行期間： 89年 8月 1日至 90年 7月 31日

計畫主持人：袁賢銘

共同主持人：蔡今中

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Revised manuscript

Design of a networked portfolio system

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Design of a networked portfolio system

Portfolio assessment is a systematic means of accumulating and commenting on homework samples by students. Such samples can display or clarify the learning processes of a particular student. Correspondingly, peer assessment enhances a student's important skills (e.g. problem solving) and motivation to learn, thus making it an excellent assessment strategy to evaluate adult learners. Peer assessment can also be performed through a networked system. In this study, system incorporates two distinct functions: one focusing on peer-assessment with the other focusing on portfolio-assessment. Functions designed to facilitate peer-assessment include on-line submission of work, on-line grading and the ability to view suggestions from peers. At the end of a semester, the portfolio-assessment allows students to select their best-written assignment.

Portfolio assessment

Portfolio-assessment involves the targeted collection of a student's work to illustrate a student's progress and means of doing so (Sharp 1997). A portfolio can include assessments and suggestions from different sources as they relate to each student's performance. A portfolio also includes the students' own reflections on their own work and their revisions. In sum, portfolio-assessment systematically collects and assesses samples of student's work, which illustrate each individual's learning processes.

Sharp (1997) suggested that most portfolios have three elements in that students must collect, make selections from and reflect on their work. In addition to its flexibility, portfolio-assessment can satisfy the different requirements of instructors for different curricula. As part of their courses, instructors can determine which elements should be included in students' portfolios. However, viewing portfolio-assessment as merely a collection of work would be incorrect since it encompasses a variety of disparate considerations. For example, it also records reflections and suggestions from peers, instructors and themselves.

Self assessment

Students reflect on their accomplishments, evaluate their work, plan revisions, set goals, and develop positive self-perceptions of their ability when they assume responsibility for their own learning.

Peer assessment

Falchikov (1995) defined peer-assessment as groups of individuals grading their peers. Topping (1998) more accurately defined “peers” as students with similar educational backgrounds. Peer assessment has been implemented in several higher education courses such as writing, engineering, science, information science and the arts. Many other researchers’ experiences of peer assessment, as a formative assessment strategy and as part of the learning, can enable students to become more

involved in class activities (Sluijsmans et al. 1999). They view peer assessment as fair and accurate as well. Sluijsmans et al. (1999) also viewed peer assessment as part of the self-assessment process. Other students' contributions through peer assessment can stimulate self-assessment. Falchikov (1993) indicated that the marks given by peers correlated well with those given by the instructor.

Introduction to networked portfolio system

Networked portfolio system contains three key sets of functions, one related to self-, peer- and instructor-assessment, the other specifically to portfolios and an assessment management interface. To realize the former, the system is designed to include on-line submission of a work, on-line grading, and allows students to view all suggestions regarding their work. In terms of portfolios, the system provides students at the end of each semester with the opportunity to determine how their work should be arranged, based on their own judgement. The assessment management interface is essential for non-IT instructors and it provides submission On/Off ("On" represents starting submission and "Off" represents cancellation of submission) switch, assessment On/Off switch and browsing results On/Off switch. The assessment management interface was constructed under the suggestions from numerous instructors who have used networked peer assessment system in their own curriculum,

e.g. an assembly language course in vocational senior high school (Lin *et al.* in press), operating systems course (Liu 1999) and technical writing course in higher education.

Self-, Peer- and Instructor-assessment

Networked portfolio system is equipped with self-, peer- and instructor-assessment for students based on the networked innovative assessment procedures (Liu 1999). The innovative assessment procedures proposed herein offer a detailed division of assessment processes, and make use of certain arrangements to strengthen the learning effect.

After a student has submitted his/her work, that work is automatically sent to a group of other students to grade. After this work is graded, the system informs the submitting student of the grades received and of any suggestions made by the peer reviewers of the work. Based on these suggestions, the submitting students then reflect on the suggestion and work quality of peers and themselves. Moreover, students can improve their next assignment and suggestions to peers based on their reflections of assessment experiences. In advance, students have learned when they participated in the networked innovative assessment procedures.

The students' preferred learning tasks in this study

Authors classify the work into five open-ended writing assignments and a final programming project and ask the students to select one of their favorite and most productive works. According to our results (Fig. 1), most students select the programming project as their favorite task and learn most from the programming project. This observation perhaps reflects only the nature of computer science students.

-- Insert Figure 1 here --

Conclusions

This study has been applied to undergraduate students undertaking an operating systems course at a research-oriented university in northern Taiwan. Students were mostly undergraduate sophomores, juniors and seniors. Applying the same method to other subjects would not necessarily yield the same results, particularly for freshmen lacking the necessary academic skills and discipline.

While this study did not focus on the qualitative evidence of the progress of learners, quantitative proof is available to show the students' preference. Our upcoming study will undertake a more thorough qualitative research to elucidate the learning effects of networked portfolio system.

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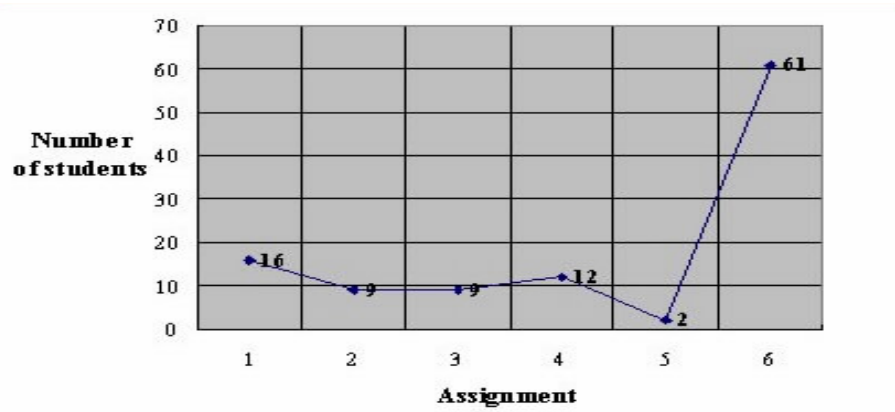


Figure 1: Preferred learning tasks picked up by students in the end of semester