FD Commons: E-Teaching Portfolio to Enable an Ubiquitous Peer Reviewing Process

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Abstract

This system development enables ubiquitous peer review and reuse of reviewer comments to assess teaching/learning in higher education. The purpose of this project is two-fold: (1) to develop applications for recording and storing reviewer annotations on streaming class lectures as time sequence data of pen-tip coordinates, and (2) to identify key principles and criteria from annotated video data to assess and evaluate the quality of teaching and learning (e-teaching portfolio). The evaluation studies were conducted to gain a broad understanding of how reviewers identify and record educational events effectively and appropriately during “lesson study (Jyugyo kenkyu)” when using this system. The collection and analysis of reviewers' annotations indicated that this system is capable of reusing collected comments in order to suggest weak and strong points in class lectures from different reviewers' perspectives.

1. Introduction

Higher education institutions provide various institutional programs for educating and developing academic staff members: development of teaching philosophies, campaigns to raise awareness of certain key components, strategic use of experts such as educational developers and teaching fellows, and funding projects aimed at specific issues. This traditional faculty development approach, however, is sometimes problematic. One reason is that faculty members have few incentives and little time to pursue professional efforts; even when faculty members recognize the scholarship of teaching and its difficulties, they often are pulled in other directions because, at many academic institutions, research and publishing are valued more highly than teaching [1]. Another reason is that workshops and seminars tend to be isolated, generic, and decontextualized. Therefore, the models of instruction used for many faculty development efforts are not conducive to helping faculty members change their approach to brushing up on teaching skills.

Because of inherent problems with ‘top-down’ models of faculty development, more effective strategies should be utilized, based upon individual contacts between staff at all levels, a mentor/developer, and students at the faculty’s institution. In other words, a more bottom-up approach is needed in order to organize a faculty learning community and cause real change in teaching strategies for more academic staff members.

In order to collect useful information on improving teaching and learning, student evaluation and self- and peer-assessment are often conducted. These assessments, however, fail to provide information about factors specific to individual departments, courses, and teaching styles because standard assessments provide only general information at the end of a term. In Japan, however, “lesson study (Jyugyo kenkyu)” is a popular professional development approach in elementary and secondary schools whereby teachers collaborate to improve instruction and learning by studying content, instruction, and how students solve problems and reach for understanding. By engaging in “lesson study,” teachers feel connected to each other and to a body of knowledge that they generate, share, and continuously refine. It is a highly worthwhile activity, which allows teachers to come together to develop their pedagogical knowledge and skills.

Unfortunately, in the context of university education, it is difficult for lecturers to learn from each other and to break the pervasive isolation of professionals. Recently, some leaders at higher education institutions have begun to provide Open Course Ware (OCW), which enables free sharing of lecture notes, exams and other resources. From the viewpoint of teacher training, however, OCW’s functions are limited. Therefore, most university teachers learn to teach in a sink-or-swim approach and ignore the fact that teaching is a highly complex enterprise influenced by multiple variables.
2. Overview of the Online Peer Review Process

The main objectives of this project are to support the peer review process and to restore and retrieve key concepts with multimedia information for the purpose of constructing e-teaching portfolios. We developed content tools for reviewers allowing them to multicast video, images, and text from tablet PCs and PDAs, which are distributed over networks.

We also investigate the positive and negative effects of mobile computing for peer reviewing process to conduct “lesson study (Jyugo kenkyu)” and to share teaching/learning knowledge for educational improvements.

![Fig.1 Overview of e-Teaching Portfolio](image)

2.1. Structure of e-Learning Courseware

We have designed and developed an online peer reviewing system "FD Commons" for lesson study. This system developed using (DirectShow), which realized integrated video streaming and annotation including lines, colors, erases, and extended tools in annotation area of Fig.2 [2][3].

DirectShow provides a common interface for media across many programming languages, and is an extensible, filter-based framework that can render or record media files on demand at the behest of the user or developer. The DirectShow development tools and documentation were originally distributed as part of the DirectX SDK, however, they are currently distributed as part of the Windows SDK (formerly known as the Platform SDK. Additionally, video frames with handwritten annotation in the summary area were developed by SampleGrabberk technology, which could filter directly in DirectShow application.

![Fig.2 Screenshot of FD Commons (Ver. 3)](image)

3. Evaluation Studies

3.1 Participants

This evaluation study continued our inquiry on how best to construct FD Commons. In order to determine any differences in identification of educational events, the novice teachers and faculty developer comments are compared on the main three "perspectives" in Version 2, and one perspective including basic teaching skill factors, added in Version 3. Our research questions were:

1. Are there any differences in comments by novice teachers and the faculty developer when using FD Commons?
2. By using a pen-based device, do reviewers write more comments and mark more points on class lecture videos, in comparison with the usual end-of-term questionnaire?
3.2 Participants

Four teachers participated; all were faculty members at Tokyo University of Agriculture and Technology. Reviewer A was an instructional designer at the Center of Educational Development (faculty developer) and has experienced "lesson study" at another university. Reviewer B was an assistant professor specializing in media informatics (1 year teaching experience), Reviewer C was an associate professor specializing in computer science (6 years experience), and Reviewer D was an assistant professor with the same specialty as the lecturer: mechanical engineering.

3.3 Data Source and Analysis

To measure the differences between novice teachers' and the faculty developer's use of FD Commons, "Snap Shots" data from different sessions of the same class (Electronics) were collected on Oct. 3, 10, and 17. The total number of "Snap Shots" was 258. As shown in Table 2, 31.8% of the recorded comments on "Snap Shots" were related to lecture content and 30.2% related to the interaction between teacher and students during class activities. Only 12.4% mentioned basic teaching skills, which are usually covered by end-of-term questionnaires.

The data were analyzed using Chi-square contingency table tests. There was a significant difference between the faculty developer and novice teachers (Reviewer B&D) are more likely to focus on lecture content. However, in the "Interaction" and "Basic teaching skills" categories, there was no significant difference between reviewer types.

Regarding research question 2, "when using a pen-based device, do reviewers write more comments and mark more points on class lecture videos, when compared to the usual end-of-term questionnaire?", based on the data analysis recorded as "Snap Shots," reviewers comments on “basic teaching skills” only made up 12.4% of the total comments. Therefore, when compared to question items on end-of-term questionnaires, more variation of comments was found when FD Commons was used. This result suggests that FD Commons has the capability to reuse collected comments in order to suggest weak and strong points in class lectures from different reviewers' perspectives.

4. Results and Discussion

Evaluation studies were conducted to gain a broad understanding of how reviewers identify and record educational events effectively and appropriately during “lesson study (Jyugyo kenyu)” when using the FD Commons system.

Regarding research question 1, “are there any differences in comments between novice teachers and the faculty developer in use of FD Commons?” there was a significant difference in the "Property of lecture content" and "Methodology" categories. The results indicated that a faculty developer is more likely than novice teachers to comment on methodology. On the other hand, novice teachers are more likely to focus on lecture content. However, in the "Interaction" and "Basic teaching skills" categories, there was no significant difference between reviewer types.

5. References


Acknowledgments

This work was partly supported by Microsoft Research Asia (MSRA) and the CASIO Science Promotion Foundation. More information about this project can be found online at: http://www.tuat.ac.jp/~fd_tools