Peer assessment in the classroom using mobile devices

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Abstract. Peer feedback can engage the learning process, but collecting the survey data into a usable format can be time-consuming, which can deter classroom teachers from undertaking the kind of in-depth analysis for classroom research. To overcome this detriment, and in order to research the effects of learning by assessing, we created a peer feedback module ("add-on") to a free, open-source student response system (SRS). Using this SRS, teachers create a survey for peer feedback. Students can access this survey through any web browser on any kind of device, from computers to smartphones, to rate their classmates' performances. The survey is reused for each feedback session. This module can output data files compatible with MFRM (many-faceted Rasch measurement) software, which allows teachers to analyse the collected data in a very short amount of time.

Keywords: peer assessment, learning by assessing, mobile devices.

1. Introduction

Teachers often use peer feedback surveys to help students focus on their classmates' speeches, writing samples, poster sessions, and other types of student performance. This process can actually engage students so that they learn while assessing. However, collecting, collating and inputting this data into a digital format for in-depth analysis is a very time-consuming endeavor, discouraging for teachers who are hard-pressed for time. The Peer Assessment (PA) module of MOARS (MObile Audience Response System) (Pellowe, 2010) was designed to overcome many of

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the time-consuming hurdles facing teachers and researchers who are interested in peer assessment.

Typically, when engaging in peer feedback, students receive a rubric that lists several areas to be assessed, with scales and descriptions for each level of the scale. Each student will review several other students' work, choosing the most accurate descriptor within each area of assessment. Each student's data is collated and later made available to him or her.

One way to collect a large amount of data is through scan sheets. Students mark the scan sheets, which are later fed through scan machines that can read the scores off of each sheet, collect the data from all of the students, and make it available in the form of an Excel spreadsheet. Even though this method represents a huge improvement over the days when one had to enter all of the data by hand into a computer, it is still time-consuming.

Using online survey tools also becomes problematic. For students to give individual feedback to each other, one would need to create a survey for each student, which is an unrealistic requirement with large classes, not to mention combined classes. Furthermore, coordinating and distributing the web URLs for each student would be quite a challenge.

2. Method

2.1. Overview of the peer assessment module design

The PA module for MOARS addresses these problems. MOARS is an open-source SRS designed to be used even with the most primitive browsers of old mobile phones, though it is optimized for smarter devices, such as the iPod Touch. The framework of MOARS allows for the devolvement of specialized modules. With the peer feedback module, teachers create a survey for peer feedback. This survey will be recycled by the system so that each student can be assessed using a new version of the same survey, relieving teachers of the need to create multiple digital versions for each student. Students are able to access these surveys with even the most basic of web browsers; they could, for example, do their evaluations on their own smartphones.

When MOARS is first installed, teachers are added to the system, course titles are added and assigned to teachers, and finally, students are added and assigned to classes. Students receive their individual usernames and passwords from their

teacher, and then they can use MOARS for quiz-type and survey (questionnaire) activities through the web browsers of their mobile devices.

2.2. Using the peer assessment module

Using the PA module is very straightforward. The teacher first creates a survey, with questions and responses matching the rubric that the teacher wishes to use for the PA activity. Then, the teacher opens the PA module on her MOARS system. She selects the survey, then selects which class(es) are to be assessed. Various options exist for the title of each survey (for example, should the surname be first, followed by the given name?). When the teacher is ready, the system will create an individual shortcut for each student's peer assessment survey. So, there is no need for the teacher to make more than one "master" survey. Even after the shortcuts have been assigned, the survey questions and options can be edited, should a typo or mistake be discovered.

The list of student names and corresponding shortcuts can be exported into an Excel sheet. If desired, this allows students to include their shortcut on their work. For example, a piece of writing to be assessed could contain the shortcut on its pages. A poster could include the shortcut on the poster itself. Presentations could include the shortcut in the corner of each PowerPoint slide.

The teacher has two options available concerning student access to the data, and both are controlled by "yes/no" toggle switches. One, should students be able to see the results of peer assessment after they submitted their scores? Two, should students be able to see their own peer assessment results? Some teachers may select to withhold all results until after the peer assessment session has ended. When this option is enabled, students can see their own peer assessment feedback as a series of bar charts.

From the teacher side of the Peer Assessment module, the results are available in two formats, "classroom results" and "research data". In the classroom results section, teachers see bar charts for each student, showing the distribution of ratings on each question. This data can be exported as a CSV file (which can be opened in Excel or other spreadsheet programs). Student rankings are also available.

In the research data section, the teacher can create and export data files that are compatible with MFRM software such as FACETS (Linacre, 2010). The "Facets_Rating_Specification" file and the "Facets_data" files should both be saved to the same folder. The "Facets_Rating_Specification" file contains the instructions

(specifications) telling the FACETS software how to read the data file, and the "Facets_data" file contains the data. This allows teachers and researchers to perform in-depth analysis on the data that was collected.

3. Discussion

The feasibility of the PA module was demonstrated in a pilot study (Holster & Pellowe, 2011), and it is being used in ongoing research by the authors on peer assessment and learning by assessing (Holster, Lake, & Pellowe, 2014; Holster, Pellowe, Lake, & Hahn, 2013). Also, its use as a classroom tool by teachers simply interested in the teacher data, rather than research data, has been explored (see for example Brown, 2013). On the negative side, the underlying MOARS itself is not easy for non-technical people to install. The system requires an Apache web server running PHP and MySQL. Also, every rater using the system has to have a username and password, making this system impractical for ad hoc use.

4. Conclusions

The Peer Assessment module for MOARS can be used by both teachers and researchers interested in using peer assessment in the classroom. A single survey can be created and then reused for each member of even very large groups of students, each with a personalized title for the survey. Teachers have fast access to classroom data, and researchers can quickly produce files for analysis by MFRM software. MOARS and the PA module are both open source software available for free download (Pellowe, 2010).

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