

Electronic Assessment Software for Distance Education Students

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Abstract

This paper examines the characteristics of 'MarkIt', a PC-based application that provides feedback on assessment items. The application has been prototyped over the past 3 years. The initial impetus for its development was the need to mark a large number of assignments submitted by students studying in distance education mode, and the need to coordinate and standardise the marking of several markers in one subject. The resultant software package incorporates features that provide students with information on the performance of their peers, plus the capacity for markers to enter detailed and consistent feedback at all stages of the marking process. A survey of students who received feedback from MarkIt showed a high level of support for its features and the level of comment on individual assessments (Armstrong, Cook, 1995; Armstrong, Cimino & Dingsdag, 1998). The need for effective feedback has been recognised by Rowntree (1987) who states that feedback is '...intentional and of the essence' and Ramsden (1992) who found students become angry if they do not receive an appropriate level of feedback. Research is currently being undertaken to assess the learning outcomes of subjects assessed with MarkIt and perceptions of students in units (subjects) that are using the current version of MarkIt to provide feedback on assessments. Key features of the system permit generation of e-mail feedback, use of key feedback comments across different units, and retention of feedback on each student's assessment. Modules under development include marks allocation, and a web-based query interface.

Keywords

Assessment, Distance education, Feedback

Summary

MarkIt is a software package that has four primary focuses:

- assisting markers in the assessment process by providing more equitable and detailed feedback to distance education students.
- reducing marking time through streamlining the process of allocating feedback to student's assessment items
- providing students with the ability to assess their performance against that of their peers
- to give students timely feed-back by email

The package has been developed at Southern Cross University with seed funding from University of Western Sydney Hawkesbury. During the entire development of the software there was a focus on improving learning outcomes, producing better efficiencies in the assessment process and providing more detailed and standardised feedback. Although the primary application for MarkIt was designed to use with assignments, MarkIt works just as well with student projects and or graduate theses . To meet these objectives, constant feedback was sought from students and academic staff. The findings from a survey of students who received feedback from an early manual version of a proto-type of MarkIt (EXPRES) were reported at the 1998 ODLAA conference. The current version has many enhanced components, which enable students to assess their performance relative to that of their peers and it has more versatility in the features and delivery of reports.

The essential characteristics of the system are that all students receive copies of all comments related to the assessment item, with all comments relevant to a student's private individual assessment appearing in a highlighted format on the final assessment report which is not accessible to other students. Apart from producing hard-copy reports, MarkIt has an email facility so that reports can be generated and sent instantly to students in local or remote areas. All comments are annotated by the percentage of the total number of times the comment has been allocated to assessments. These characteristics provide students with an overview of peer performance, enables the student to assess there performance against that of their peers and an indication of how the assessor, be it one lecturer or a team of tutors, expected students to perform. The system provides markers with a consistent model on which to assess; automatic calculation of comment frequencies, and efficiencies by minimising the time-

consuming annotation of the same or similar comments on students' assignments.

Introduction

Distance education is a major, tertiary-education delivery-mode used by education providers worldwide. Support systems for distance education are increasingly essential in order to provide quality service in learning outcomes. Owing to an emphasis on written submitted assessment in distance education, learners rely primarily on the feedback they receive on assignments. Students expect meaningful comments on their assignments and projects, and are disappointed when their efforts are not rewarded by constructive feedback or their assignments are marked inconsistently (Ramsden, 1992). It is reasonable to expect detailed, individual feedback in units with a small number of students. However, in units with large enrolments this level of individual feedback and comment is time-consuming, repetitive and can lead to inconsistencies, particularly if a number of different markers are involved. Arguably, aside from course materials, phone and Web support, assessment feedback may be their only major interaction with academic staff.

MarkIt is a software package with a focus on improving learning outcomes by providing more detailed and standardised feedback to distance education students. The intended learning and other outcomes aside from the technical development of MarkIt are to achieve:

- Consistency in assessment procedures, especially if more than one marker is involved in marking the assessment items.
- Enhanced levels of feedback provided on student assessments.
- Provision of information enabling students to assess their performance relative to that of their peers.
- Productivity improvement and efficiencies owing to the reduced duplication of effort enabling assessors to focus on the content and quality of feedback through a consistent model.

The development of MarkIt has been an ongoing project, originating with a manual feedback prototype, EXPRES, trialed over a two-year period. Students were surveyed regarding their views on the effectiveness of the manual feedback mechanism during this trial period with favourable comments on most aspects of the approach. The survey instrument comprised quantitative Likert scale items as well as open-ended questions.

A number of comments from respondents led to several enhancements being built into the latest automated version. Preliminary surveys of students of this assessment approach, which was central to MarkIt's implementation and development, indicated that students see the approach as important and believe it should be more widely adopted (Armstrong, Cook, 1995; Armstrong, Cimino & Dingsdag, 1998).

MarkIt is in its final beta-testing phase and will soon be considered to be in a commercially viable form. A number of educational institutions within Australia and internationally have shown interest in MarkIt and have assisted the development team by providing suggested improvements. Many of these improvements have been incorporated into MarkIt. More recently some academics at UWS-H received MarkIt CD-ROMs to trial. In some cases this was prompted by the promotion of a commercially available electronic marking system called MindTrail. MarkIt offers substantially different functionality to that of MindTrail. Users have all offered favourable supporting commentary on the versatility of MarkIt for the provision of assessment feedback.

An Outline of the System and the Reason for its Development

The educational philosophy underpinning the development of the system is that external or distance mode students don't have the benefit of regular interaction with their peers nor face-to-face learning environments involving their lecturers. This lack of collegial interaction is increasingly evident with the growth of Web-based and other more conventional distance education methods. Pedagogically regular interaction between students and between students and academics is essential. When they are not part of the learning process feedback from assessment items may be the only form of interaction distance students have with academic staff whose annotations on exam papers and submitted assessments become all the more essential. While it is impossible to overcome this distance education dilemma entirely it is possible to provide students studying in distance modes with a complete list of general comments related to assessment items.

The literature and other data bases relevant to electronic feedback indicate that system development in the area has reached a level that provides feedback as an adjunct to individual assessment items, but provides little or no relative peer indicators (LodgeIT, 1996; <http://www.utexas.edu/world/lecture>, 1998; Boles, 1999). The literature

and World Wide Web sites examined show that feedback is rarely consistent and students do not have access to the full set of comments provided on all assessment items, thereby receiving little information on their performance relative to that of their peers or expectations of the assessors (Kelly, 1993; Jones, Petre, 1993; Hara and Kling, 2000). In some cases sample solutions provide relative feedback based on the individual's comparison between their submission and the marked assessment, but there are no relative comments indicating the level of individuals' performance.

In addition, despite extensive examination of the Internet, other electronic databases and relevant literature, so far only two assessment approaches that provides reference points have been identified; MindTrail, the only other known system has similar technical application, which is commercially available, does not have features as sophisticated nor as flexible as MarkIt's. The author of the only other known article on the use of email for assessment applications has also had difficulties in identifying previous use of email for assessment purposes (Boles, 1999). Consequently, MarkIt was developed without guidance as to the technical development and little as to how the best learning principles could be incorporated technically. After a long period of maturation MarkIt has been developed to enable markers or assessors to enter lists of comments related to assessment items. The lists can be arranged to suit the format and structure of individual assessment items whether they are submitted assignments or exams. When marking an assessment submission, examiners 'choose' those comments relevant to each individual assignment or exam with these comments being highlighted on the final assessment report (Figure 1).

The MarkIt method of feedback is not appropriate for all types of assessment items and it is not intended to replace the need for individual comments and annotations on student assessment submissions. It is meant to complement the conventional feedback methods to provide a consistent set of feedback for units/subjects with multiple assessors, to provide details of peer performance, and to integrate technology with a focus on educational outcomes in addition to marking efficiency.

Summary of Survey Results

The questionnaire was designed with two main sections - perceptions on the effectiveness of this type of feedback and quality of the feedback in relation to an individual's performance. Questionnaires were issued to

both internal and external students. Both sets of students received the same feedback sheets, had the same assignment to prepare and were assessed using the same criteria for the assignments. A response rate of 43% was achieved from internal students and a response rate of 28% from external students. The survey was returned with the first assignment and there was no follow-up with a second questionnaire for the 2nd assignment. The results need to be viewed in light of these limitations. It is intended to extend this study to include these points and extend the process to more units before releasing MarkIt commercially.

Responses to questions on the level and feedback value of comments provided in the feedback proforma are presented in Table 1 (external students' responses) and Table 2 (internal students' responses). When the proforma was first written it was felt that there was adequate provision in the comments for students to gain an appreciation of how other students were expected to perform in the assessment.

Responses from both groups highlight that this section of the proforma did not provide enough detail in relation to peer performance. To counter this deficiency, performance statistics (mean, median, mode, standard deviation, etc) plus specific comments relevant to peer performance, will be provided as part of the feedback for future assessments. It is interesting to note that 33% of external students thought this aspect of the proforma was poor while only 10% of internal students thought it was poor and 33% thought it was below average. These differing views may be partly explained by peer interaction. That is, internal students getting together to discuss and compare their results. External students do not have the same opportunity for this type of comparison and interaction.

Responses to question 7 also reflect an interesting disparity. External students felt that the comments section met their feedback needs very well or well while a significant proportion of internal students felt the it was only average or below average. It is difficult to identify causal relationships, but it is felt the differences could be demographic, related to self-motivation and self-selection of external students or the maturity and self-developmental differences between internal and external students. Another explanation could be that the level of feedback in the proforma was significantly better than any feedback provided to external students in the past and therefore rated highly compared to feedback received from other units the respondents had studied in distance education mode.

Questions	Very Well	Well	Average	Below Average	Poorly
aspects I did correctly	33%	77%	0	0	0
aspects I did incorrectly	33%	56%	11%	0	0
expected students to do well.	11%	56%	33%	0	0
expected students to do poorly.	33%	33%	34%	0	0
how other students might have performed.	0	22%	45%	0	33%
Same as the format of the marking scheme	56%	33%	11%	0	0
comments section satisfied my needs for feedback	56%	44%	0	0	0

Table 1 - Questions 1 to 7 External Students

Questions	Very Well	Well	Average	Below Average	Poorly
...aspects I did correctly	24%	62%	14%	0	0
...aspects I did incorrectly	24%	57%	19%	0	0
...expected students to do well.	33%	48%	14%	5%	0
...expected students to do poorly.	24%	24%	48%	4%	0
...how other students might have performed.	5%	14%	38%	33%	10%
...same as the format of the marking scheme	24%	48%	28%	0	0
...comments section satisfied my needs for feedback	24%	48%	24%	4%	0

Table 2 - Questions 1 to 7 Internal Students

Responses to questions 8 and 9 relate to the detail of the comments and the detail in the sample answer sections of the proforma. Students' responses are summarised in Table 3 (external) and Table 4 (internal). The sample answer section contained only truncated and partial solution extracts to the questions raised in the assignment. Most students thought the detail in the lecturer's comments was good while a significant proportion of students thought the sample answers were too truncated and did not provide enough detail. Many student comments related to the need for full answers to be provided in this section, not truncated or partial answers. The sample answers were deliberately truncated and in some cases left hanging to stimulate students to explore issues they may not have covered rather than relying totally on lecturers' feedback.

Questions	Excellent	Good	Average	Below Average	Poor
...detail in the comments marking section was...	11%	78%	11%	0	0
...detail in the sample answer section was...	33%	33%	22%	0	12%

Table 3 - Questions 8 to 9 External Students

Questions	Excellent	Good	Average	Below Average	Poor
...detail in the comments marking section was...	10%	81%	9%	0	0
...detail in the sample answer section was...	0	52%	38%	10%	0

Table 4 - Questions 8 to 9 Internal Students

Responses to question 10 to 12 are presented in Table 5 and Table 6. This category of questions sought students' feedback on the relevance of the proforma to students' self-development. The majority of students were satisfied with this aspect of the proforma. However, a significant proportion felt that the comments did not provide appropriate direction for students to assess their performance. It is felt this may partly relate to the level of detail in the comments and also partly to differences in provision of extra, personal comments placed on each assignment. Once again, the study has not yet been extended to identify causal factors giving rise to these comments.

Questions	Very Well	Well	Average	Below Average	Poorly
...identify the aspects I did correctly	11%	56%	11%	0	22%
...identify the aspects I did incorrectly	33%	56%	11%	0	0
...things the lecturer expected students to do well	33%	56%	0	11%	0

Table 5 - Questions 10 to 12 External Students

Questions	Very Well	Well	Average	Below Average	Poorly
...identify the aspects I did correctly	5%	57%	10%	0	28%
...identify the aspects I did incorrectly	24%	57%	14%	0	5%
...things the lecturer expected students to do well	5%	76%	19%	0	0

Table 6 - Questions 10 to 12 Internal Students

Students made a range of comments related to various aspects of the assessment proforma. Some of these comments are:

- easy to follow - relates to the structure of the assignment questions.

- not all highlighted responses fit the assignment response by the student.
- the format is good as it tells us where we went wrong or did the right thing and sample answers allows (sic) us to see what we could have done.
- Each question (set of issues) were dealt with and assessed separately, therefore gave me an appreciation of where my strong and weak points are. This will assist in revision.
- This is the most I've had from a tutor on all my assignments in the past two years of Uni study. Comments do help point out mistakes I've made and what I missed in the content.
- you can never get enough feedback when you study externally. Important to get it back quickly. If it takes too long to get back the quality of the comment matters little. In this case return times were OK and comments were pertinent (sic).
- helpful comments and constructive criticism aided in my understanding of how to better present my next assignment. The length of comments did indicate that the lecturer did fully analyse what I had to say rather than skimming.
- really liked the little lovelies such as 'covered things I had not thought of' - good positive reinforcement.
- feedback provided was excellent. It was easy to follow and most helpful in understanding what was required. It conveyed strong and weak points in assignments (marking) and your comments helped strengthen these points. The exam appeared to be too long in content for the time given to complete it.
- I feel that the truncated answers were too short but understandable due to time restrictions. The only point I would make is that if time permits, to make the answers complete instead of truncating them.

Planned Development and Enhancements

A number of developments are still planned for the system to enable it to meet a full range of assessment needs of different educational sectors, not just the tertiary sector. As a result of the survey a number of initiatives were implemented into MarkIt. The major enhancement made as a result of the survey was to facilitate inclusion of individual comments. This enhancement should address the concerns raised by internal and external students to question 10.

A marks recording and grading module is currently under development. This module will allow users to enter results for assessment items for students and to allocate grades based on predetermined criteria or results distributions.

It is proposed that MarkIt be hosted on a Web site to enable students to have on-line access to comments. The development of routines to ensure the security and privacy of feedback to individual students is already progressing under another project developing an on-line assignment submission system.

Conclusion

Response to this type of feedback mechanism is undoubtedly positive. As one student commented 'you can never get enough feedback as an external student'. There is significant work to be done in the area of feedback particularly for external students. Improved feedback is only part of the prospectus in overcoming isolation. Figure 1 shows an extract of the feedback report produced by MarkIt.

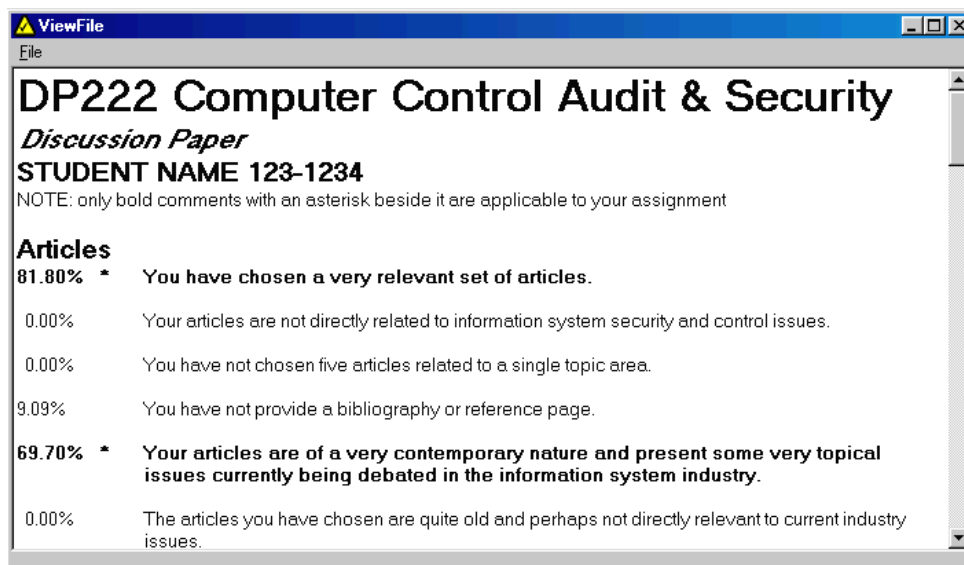


Figure 1 - Sample Report Section

There are many avenues for further investigation of feedback mechanisms for distance education students such as electronic feedback (coupled with

electronic submission of assignments) and automated feedback packages. However, whatever approaches are adopted, due consideration must be given to the cost and resource implications. We cannot aspire to true distance education if our students are forced to pay exorbitant fees for the facilities necessary to study by using 'high tech' communications and electronic media.

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