ONSCREEN MARKING FOR ELECTRONICALLY SUBMITTED ESSAY TYPE QUESTIONS

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Abstract

This paper is written at the start of a project and will elaborate on how an Onscreen Marking Tool was developed and describe how the tool is proposed to work. Presenting at an International conference, provides an opportunity to gather valuable inputs that can contribute to improvements of the Onscreen Marking Tool. We believe this tool can offer a solution that will save time and improve accuracy and consistency when essay-type assignments are graded.

Assessment of students is an ongoing practice for educators worldwide. Large class sizes in South African Universities, the demand for increased research outputs and community involvement, add to the growing workload on faculty members. A wide variety of assessment techniques are favoured for assessment in different subject areas. Formative assessment methods (observation, multiple choice tests, portfolios, classwork assignment etc.) should include objective feedback that in turn provides valuable learning opportunities. However, large class sizes and heavy workloads make consistent, individualised feedback problematic and relegate the educational impact of formative assessment to a futile exercise.

Essay-type assessments remain an important form of assessment. The practice of grading essays in an environment where large classes are the norm, includes the appointment of assessment teams (tutors, multiple lecturers, externally contracted assistance), leading to the repetitive question: How can one ensure quality and consistency, and provide constructive, personalised feedback to large student numbers in the case where assessment teams grade the same assessment? Another challenge relates to students’ propensity to compare feedback and marks among themselves, as well as relate the feedback to the marks they received. If different assessors were employed, the risk of low inter-rater reliability is evident, especially when their work is not moderated. This often leads to an unsustainable number of student consultations and regular changes in grades.

An established grading strategy to overcome these challenges is the use of rubrics and assessor calibration, in conjunction with an agreed-upon set of feedback prompts, as this enhances inter-rater reliability and elevates the quality of feedback. Assessors apply different techniques when they use rubrics, such as ticking relevant boxes and writing additional individualised comments on the rubric. The rubric is then attached to the graded assignment.

In the digital age, electronic submission of assignments via the learner management systems (LMS) have become the norm. Electronic or e-grading (as opposed to printing and then marking paper-based artefacts) through the use of rubrics have brought a new set of technical difficulties, which requires a revisit on the way rubrics are used to grade essay type assessments. Technical difficulties include the inconsistent techniques used by assessors, as well as inconsistent file formats submitted by students and assessors alike. If the assignment was submitted as a .doc file, some markers would prefer the review function whereas others would prefer to use track changes in word processors. If the assignment was submitted in portable document format (.pdf) or as a scanned handwritten assignment (pdf or image files) it becomes even more problematic to grade and ensure consistency in the manner in which feedback is given. These issues make grading, commenting and personalized feedback on essay type assessments a great challenge for many lecturers.

To address these needs, and to safeguard consistency and quality in terms of the way in which essay-type assessments are marked and feedback is given, an onscreen marking solution was envisaged. The marking tool needs to take care of repetitive tasks, such as adding marks and also improve the use of rubrics with standardized feedback, as well as the option to give personalise feedback for individual students. The Onscreen Marking Tool should not add to the workload of assessors, but improve on the quality of feedback and marking. The solution was implemented at North West University in January 2017.

Keywords: Marking assignments, electronic marking, marking rubric, assessment.
1 INTRODUCTION

The assessment of students’ learning is a widely debated topic. New assessment strategies are tried and tested by academics across the world. Every new assessment strategy or technique strives towards solving the challenges academics face to ensure reliable and valid results. When an academic institution awards a qualification to a student it is assumed that such judgements are based on educationally sound assessments of students’ abilities. In some cases such as the medical profession, additional examinations are required by the professional body governing that profession to ensure that the candidate is indeed qualified to do the work. Reliable and trustworthy assessment practices are paramount to the success of any academic institution to ensure the quality of the qualifications they offer.

In *Assessment revisited*, the current state of affairs is documented by Diana Pereira, Maria Assuncao Flores and Liala Niklasson [1]. Their research documents the current research trends of research in the assessment and evaluation in higher education. The paper concludes that the research done over an eight year period focussed on assessment methods and their effectiveness, fairness, and impact on learning. They also looked at modes of assessment ranging from peer assessment to self-assessment. The overview considered, amongst others, portfolio assessment, written essays, group assessments and digital diaries. In all cases the mentioned assessment methods must be graded in one way or another. Grading assessments can be a daunting task in academic practice, which presents several well-known and psychometrically defined challenges. However, the search for ways to improve on the turnaround time for grading assessments remains. The administrative load on academics increases with the logistics that comes with the handling of assignments and assessments. In the digital age students submit their assignments online, which increase the workload even more as the assignments often need to be printed before it can be graded. Therefore the need to find a solution to grade digitally is of the utmost importance.

This paper does not aim to critique the current state of assessment practices, nor does it propose new ideas for assessment. It reports on a project that aims to solve the unique challenges lecturers face in a specific South African higher education context when marking assignments submitted electronically.

2 THE CHALLENGES ACADEMICS FACE IN HIGHER EDUCATION IN SOUTH AFRICA

In the South African (SA) context lecturers face similar challenges that all lecturers across the globe face. Regular, fair, consistent, extensive and valid feedback on assignments is key to students’ learning. Students will learn from feedback only if it is timeous and specific. Merely supplying a memorandum to students afterwards is not effective, as little learning occurs, especially by younger, inexperienced students. In our experience, a student would confront the lecturer with a memorandum and claim that the work in the assignment compares favourably to the memorandum, with some differences in the style of presentation.

One of the biggest challenges faced in SA relates to large class size (variations of between 250 to 20,000 students per module, depending on the context). Strategies to overcome this challenge are listed below. These strategies are not unique to large classes only. However, large classes demand a unique application of trusted and proven solutions as some solutions do not scale well. The following are common elements of the assessment scenarios in SA.

2.1 Electronic submission

Most universities use Learning Management Systems (LMS). Students are comfortable with submitting assignments and portfolios online. This format in itself relieves some of the workload associated with manually submitted assignments. This practice however, moves the workload of printing the electronically submitted assignments from the student to the lecturer. For distance students the burden then also falls on the lecturer to scan and return the graded assignment electronically to the student. As printing of digital assignments is not ideal, what is the digital equivalent or alternative? One solution could be to use the review function in MS Word, but this can also become tedious as the rubric still lies outside the software and it laborious to type, or copy and paste comments into the assignment from the rubric document or marking scheme.
2.2 Multiple assessors

In an attempt to improve turnaround times, and alleviate the workload on lecturers with large classes, additional staff such as tutors, and internal or externally contracted assessors are appointed to assist with grading assignments. To ensure consistency in grading, the assistant assessors require extensive training. The use of marking rubrics achieve consistency to some extent, however training (assessor calibration) is still required to make sure that all the assessors understand and apply the marking schema or rubric in the same way and that the level and use of feedback is consistent. Another administrative challenge with the use of multiple assessors, is keeping track of the assignments - knowing who received which assignments and which assignments were returned after grading (as in a work-flow system).

2.3 Feedback

As already stated, feedback is an essential component of learning. It has been noted that students often lack the ability to objectively compare their answer to model answer or memoranda, and therefore often require more extensive or individualised feedback. This is a complex and labour intensive task due to the volume associated with individualised feedback on work in a large class context. Keeping to turnaround schedules often leads to rushed assessments and brisk feedback which can lead to shorter less detailed paragraphs towards the end of the assignment stack. The legibility of the assessor’s handwriting can also play a role in misunderstanding of feedback. Once again it suggests that a marking rubric with pre-written feedback, seems to be a possible solution. If the assessor is able to select pre-written feedback, and have the option to customise and individualise the selected feedback as needed, this option will promote consistency, and improve the turnaround times.

2.4 Rubrics

The use of well-developed rubrics have the potential to promote effective and objective grading of assignments as well as provide proper feedback and direction. Many lecturers are already familiar with the use of rubrics and often attach the completed rubric to the graded assignments. Some already use their grading rubrics (word document) digitally through cutting and pasting their pre-defined comments from the word file into the assignment, using the track changes function in their word processor software.

2.5 Errors in adding and calculating marks

Another obstacle associated with the digital grading of essay type assessments is the scoring of the final grade. This is often done by adding up the marks, as indicated in comments and track changes. Errors associated with adding and calculating marks tend to affect the trust relationship between student and lecturer (regardless of who graded the assignment). Accuracy when adding marks is critical, however errors do happen. Our solution is that the computer can add up the marks.

3 SUMMARIZING THE KEY PROBLEM AREAS

Can marking large numbers of digitally submitted assignments, be simplified without sacrificing the quality of feedback which is important for effective learning? Can one improve the accuracy and consistency across assignments marked by various assessors? Can this process be sped up in order to ensure timeous feedback and accurate scores to students?.

4 SOLUTION

Lecturers requested support staff to investigate possible solutions that could automate certain aspects of grading electronically submitted essay type assignments. The use of Learning Management Systems (LMS) already provide the students with an easy manner in which they can submit their assignments online, with the combined benefit of tracking all submissions. The LMS also offers the lecturer the opportunity to send the graded assignment back to the student. The dilemma was to find a way to preserve the assignment as a digital document which can be marked digitally, using rubrics that will result in consistent, quality feedback that can be incorporated into the grading with accurate calculation of marks.
4.1 Planning

Sessions were held between academic and support staff, during which the academic staff explained their different grading preferences, as well as possible unique grading demands for their respective fields of study. Academics were requested during a workshop to express their needs in a scenario where assignments could be marked digitally. A programming team was contracted to develop the solution. Based on the well-known benefits and universal nature of portable document formats (.pdf) and the availability of Adobe Acrobat Reader software, a decision was made that the marking tool should operate within the Adobe Acrobat Reader software.

4.2 Digital Rubric

To create rubrics for grading assignments, an interface was developed. The rubric had to be flexible enough to accommodate various marking styles and strategies whilst retaining ease of use. A simple field completion application was developed which can be populated by the lecturer. Figure 1 shows the available fields.

The first 3 fields make provision for biographic detail, including the Course Code, Assignment Number and total maximum Assignment Mark.

When using rubrics, the lecturer defines different categories according to which an assignment will be graded. Each category in turn is subdivided by the aspects considered during grading, and which determine the grade for the category:

- The **Comment Category** field is where the descriptor of the aspect to be assessed is entered. Examples of descriptors include referencing, technical appearance, exposition of knowledge, analysis, spelling and grammar etc.

- The **Comment Descriptor** is the degree to which the comment category is achieved asking how well did the student do in terms of the particular category. Examples could include terms such as above average, good, incomplete, sufficient etc.

- The **Comment** field is where general feedback can be compiled for each descriptor within each category. This could be the typical feedback usually given to students to indicate how well they did, areas of shortcomings and possible improvements associated with categories and descriptors.

![Figure 1. Rubric completion form](image)
4.3 Different marking strategies

Although the use of rubrics is encouraged, some subjects still require the conventional ticks and crosses or simple impression marks without comment. Figure 2 shows the marking toolset and a portion of a document that was marked with these tools. The tool bar to the right shows the tools from which the assessor makes a selection (icons similar to Lego blocks). The panel to the left depicts the real-time grading result generated by the selected tools.

The tick tool creates a tick mark which carries a specific value to the final grade. The value of the tick mark can be adjusted by the assessor. The half-tick creates a different looking symbol which carries half a mark to the final grade. The cross merely indicates an error of commission, or omission without any implications for negative marking. The summary mark option provides the marker with the opportunity to simply ‘stamp’ a mark of an entered value onto the assignment (in this example a mark of 6 was given). The summary mark, together with a comment is taken from a rubric (mark of 20 in the example). As seen on the example, the mark contains a little yellow comment symbol on the edge of the mark (at the three o’ clock position), which contains feedback.

4.4 Marking with the rubric

When the summary mark with comment tool is selected, the selection panel shown in Figure 2 on the right affords access to the rubrics created with the interface discussed in section 4.2. In this example, see Figure 3 the assessor awarded a mark of 20 and selected the rubric saved with the filename Rubric101_3.txt.

In the rubric the comment category, analysis and evaluation are selected. The comment descriptor aligned with the level of “accomplished” is selected and the general feedback for the performance level is displayed. If the assessor wants to personalise the feedback for the specific student, they are free to change/add to the feedback at this stage.
As soon as OK is clicked, the mark is stamped onto the assignment along with the feedback. When the students receive their graded assignment they can gain access to the comment by merely clicking on the mark. This is a popular feature among the academics and assessor, as it provides them with the opportunity to provide good, consistent feedback across all assignments, with the freedom to alter the marks and add individualized feedback where needed.

![Figure 3. Completed item in rubric](image)

**4.5 Results**

Once an assessor has finalised the grading the assignment, two options are available. As seen in Figure 2 on the right hand side of the figure, there is a *Calculate Total* and *Calculate Total with Comments* options. Once one of these options is selected the results summary is added to the end of the assignment (shown in Figure 4).

Upon finalising the assignment the assessment result summary is stamped onto the second last page of the assignment. Summary marks are those marks stamped onto the assignment without comments (6 in the example used in Figure 4). Analyses and Evaluation, Interpretation and Presentation reflect the summary marks with comments allocated from the rubric. The last mark of 1.5 is the sum of the ticks and half ticks added to the assignment.

![Figure 4. Marks distribution](image)
Figure 5 shows the total assessment result and prompts the marker to finalise and save the graded assignment.

![Assessment Result](image)

Figure 5. Final results

4.6 Routing

Once the assignment is graded, the scores allocated are added to the file name. The work-flow system then routes the assignment back to the student and updates the gradebook on the LMS.

5 CONCLUSIONS

5.1 Feedback from students

Feedback from the students was positive and they reported that they liked the feedback provided. The feedback was consistent and readable. Improved turnaround times also impressed and the fact that no addition errors were made was welcomed.

5.2 Feedback from lecturers

Lecturers appreciated the fact that they did not have to manually write elaborate comments on every assignment. The automated adding of marks saved time. A few lecturers experienced some difficulty with the creation of rubrics or to transfer existing paper rubrics into electronic format. Some technical difficulties were experienced with the installation of the tools. The lack of the marking tools to accommodate mathematical fonts and audio comments were identified as shortcomings and will be looked into during future development.

ACKNOWLEDGEMENTS

We would like to acknowledge all the contributors who assisted in the development of the Onscreen Marking Tool and the lecturers who used it.

REFERENCES