University of Gloucestershire
School of Computing and Engineering
BSc in Computing

Proposing Improvements to University Web-based Grading Systems

Bailey Lylyk
S4001175

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Abstract

This is your abstract.

Dedicated to ...

Acknowledgements

Acknowledgement section.

Ethical Issues

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Chapter 1

Introduction

1.1 Overview

At any level of education there is a need to mark students' assignments fairly and consistently, however the question of how to achieve this have long since plagued the institutions involved as there is a great degree of uncertainty when it comes to grading assignments with regards to many different factors including open ended projects which cannot be rigidly graded using a standard rubric system, creative projects which involve very different criteria for marking compared to fact-based scientific work. These grading systems must also allow flexibility for varying but correct interpretations of the assignment questions and so on. A rubric is a commonly used tool for assessing students' work by laying out criterion and different levels for each (Jones, Allen, Dunn, and Brooker, 2017) , resulting in an overall grade being produced.

1.2 Problem Statement

This research paper aims to look specifically at the web-based grading systems used at a university level, evaluating and comparing different systems key benefits and drawbacks in regards to the marking and feedback elements of the systems as well as utilising system users' opinions and viewpoints on the system to propose a new solution which aims to improve on the drawbacks of existing systems while maintaining their strengths.

Evaluating and improving marking and feedback systems at a university level.

1.3 Research Questions

1. What are the key benefits and drawbacks of existing systems for marking University Assignments?
2. How can these drawbacks be improved on while maintaining the positives?
3. How to evaluate that a new system improved marking processes?

1.4 Objectives

1. To conduct literature review and investigate the strengths and weaknesses of existing grading systems.
2. To propose and implement improvements to these systems based on qualitative data and literature around the subject.
3. To evaluate the implemented prototype system to verify it addresses the improvements.

1.5 Scope

The scope of this dissertation is encapsulated by the marking and feedback systems integrated into the web-based applications utilised by universities and does not include other systems that may be included in these applications such as lecture resources and module guides for example. The research also primarily focuses on modern processes for marking involving web-based applications but will make reference and comparison to legacy systems such as physical hand-ins.

1.6 Conclusion

Conclusion.

Chapter 2

Literature Review

2.1 Introduction

This literature review aims to summarise key points from relevant literature regarding marking systems, separated by area, going over papers covering UI(User Interface) and UX(User Experience) As well as papers which explore in depth the benefits and drawbacks of rubric based grading which will be a primary focus throughout this dissertation to determine how existing rubric systems can be improved to provide greater uniformity and speed when marking assignments at a university level. Identifying the key areas of these systems will support decisions made for research methodology and provide a basis for the research to be conducted on.

2.2 Literature Table

Title	Author(s)	Source	Findings
Improving assessment processes in Higher Education: Student and teacher perceptions of the effectiveness of a rubric embedded in a LMS	D.Atkinson and LL.Siew	Journal	95 percent of Students reported more clear understanding of assigned marks and recommended further use of the system. Teachers reported a 40 percent Reduction in time taken for marking.
Teaching for quality learning at university	J.Biggs and C.Tang	Book	A rubric is simply a clear criteria of grading standards. The use of rubrics is recommended in any form of extended prose as students find them easier to understand and they steer students towards intended learning outcomes by acting as signposts with the caveat that rubrics need to be highly detailed for accurate assessment.

Longitudinal perspectives on students' experiences of feedback: a need for teacher-student partnerships	D.Carless	Journal	With a focus on how perspectives evolved over time, this study demonstrates that students often feel that there is a dissonance between feedback received and what would be useful to them. Feedback is integral to the development of a student, though it is stated that transmission forms of feedback do not cater to students needs for improvement as well as they could. It is proposed that greater use of interrogative feedback could help with this.
Innovative Pedagogical Practices in the Craft of Computing.	JH.Davenport, A.Hayes, R.Hourizi and T.Crick	Conference	For objective questions automation could be applied for marking which was strongly welcomed by students at a Bath university as rapid turnaround kept up engagement with the course content.
Evaluation of a Tool for Java Structural Specification Checking.	A.Dil and J.Osunde	Conference	A tool which automatically marks java-based assignments is developed. There is evidence of broad acceptance for automated marking but only moderate interest, though 6 of 8 tutors reported that the tool was at least 'likely' to spot errors in code that they had overlooked.
Marking exams? When it comes to workload, less can mean more	J.Elmes	Website	The study by Baucells and Zhao suggests that working in 'on and off spells' greatly increases productivity in marking, reducing total working time for marking a number of papers from over 10 to around 7 hours of work.
Review of external examining arrangements in universities and colleges in the UK	J.Finch	Technical Report	A number of proposed changes and standards for external examination in higher level education are suggested.
CAFAS Online - User Guide	M.Freney and H.Ellwood	Technical Report	The user guide for an online marking system used by universities, which highlights the importance of accessibility features so that disabled students are not at a disadvantage.
Personality, assessment methods and academic performance	A.Furnham, S.Nuygards and T. Chamorro-Premuzic	Journal	With a shift to more coursework focused courses, universities have adapted marking methods to better assess understanding over simple memory. The marking methods for coursework also produce much more meaningful and useful feedback for improving weak areas in a students understanding compared to traditional exams which lack much of any kind of feedback other than a grade.

Written Feedback for Students: too much, too detailed or too incomprehensible to be effective?	C.Glover and E.Brown	Journal	A study on 2 UK universities looks at improving student learning by changing the way feedback is given for assignments. Found that based on 4 conditions for effective feedback, that most of the time feedback given it not frequently effective for students due to a lack of feed forward, or redundancy for future assignments. Most feedback given is just identifying faults rather than corrective.
Electronic management of assessment	M.Hast and C.Healy	Website	A series of studies into the priorities of universities and colleges in implementing electronic management of assessments sparked by the growing interest in such processes in the sector in order to allow higher education institutions to maximise the benefits of EMA.
Higher Education Marking in the Electronic Age: Quantitative and Qualitative Student Insight	L.Gray and G.Ferrell	Journal	The study conducted shows that a statistically significant percentage of students preferred online platforms for submitting assignments, as well as receiving and evaluating feedback, showing an increase in the trend of preferring online platforms for this compared to past studies.
Conditions that enable effective feedback	M.Henderson et al.	Journal	Current feedback in higher education is lacking as it focuses more on justifying a grade than improving learning. The study on Australian universities intends to change the way feedback is presented, shifting it towards a more learner-centric model by identifying current practices and proposing a new framework for feedback. Proposes a model of 12 conditions for effective feedback.
Teaching with moodle in higher education	AP.Lopes.	Conference	An overview and general review of moodle features, detailing why the platform is popular, largely crediting its expand-ability due to being open source, as well as the low cost of implementation for the same reason.
Assessment and Feedback in Higher Education: A Guide for Teachers.	T.McConlogue	Book	Proposes the idea of 'calibration activities' in forming academic standards, in which students and teachers work together to form these standards through activities, resulting in tailor-made standard per course. The book also argues that an understanding of what academic standards are integral to creating a successful assignment.

From monologue to dialogue: improving written feedback processes in mass higher education	D.Nicol	Journal	Roughly 40 percent of students reported that they were at least in some way not satisfied with feedback given on assignments, which the study blames largely on the shift away from one-to-one style feedback with students due to growing numbers of students making the system overly difficult to integrate into most universities. Some methods are proposed for improving written feedback such as students expressing preferences for marking format or submitting questions they would like to be answered with their assignments.
STAGE: a software tool for automatic grading of testing exercises: case study paper	S.Pape, J.Flake, A,Beckmann and J.Jurjens	Conference	A study on an automatic system for grading java programs in moodle, which yielded support from students when surveyed, which found that most students had a positive or at least a neutral experience with the system and the system was found to free up teaching resources, allowing teachers to focus on other areas of grading, improving overall grading quality.
Using feedback to help students to learn Feedback and learning	P.Race	Technical Report	Race argues that there are some key benefits of computer-delivered feedback such as legitimising learning by trial and error, encouraging learning from mistakes as well as being able to work through feedback and learning materials at their own pace, but states that it is hard for teachers to tell if students are actually benefiting from feedback delivered online as well as it being harder for students to act on feedback as if they don't understand it, it is not as easy for them to ask questions in this format. Race therefore argues for a balance between efficient and high payoff methods.
Beyond Fairness and Consistency in Grading: The Role of Rubrics in Higher Education	K.Ragupathi and A.Lee	Book	Argues that a push towards using rubrics in grading gives students a better understanding of what criteria they are being marked on, and helps to manage expectations. The authors go on to discuss different types of rubric and why they matter, citing that rubrics embody transparency and fairness. Methods for creating effective rubrics are also discussed.
Marking, grading and giving feedback	Cardiff University	Techincal Report	A learning resource for lecturers who are new to grading, discussing key aspects of quality assessment, such as how to provide useful feedback and the features of high quality assessment.

An online platform for teaching upper secondary school computer science	J.Waite et al.	Conference	A paper reviewing an online platform for learning computer science at an upper-secondary level. Automatic marking is discussed for assessment in automate-able question types such as multiple choice, stating that automatic marking is much simpler to do than in open-ended coding problems due to some elements of teaching involving very abstract concepts which may not be objectively mark-able.
The need to disentangle assessment and feedback in higher education	NE.Winstone and D.Boud	Journal	The authors argue that marking has become too focused on justifying a grade instead of learning to prevent student challenges and that even is feedback is useful sometimes it comes too late or is not relevant to any future assignments, and does not support overall learning much. They also mention the idea that by grading anonymously with the intent of avoiding bias, feedback becomes depersonalised and is reduced in quality. They then go on to present some ideas for encouraging learning from feedback such as tracking the input of feedback and designing tasks with the feedback integrated into them.

2.3 What is marking in higher education?

At any level of education, marking is an important process which appraises students' assignments to produce a grade and determine if a student has passed a piece of coursework, an exam or other form of graded work and to provide feedback on this work. There is somewhat of a rift within the perceptions of objectives for grading among teachers and lecturers, with many authors stating that there is far too much of a focus on simply providing a student with a mark and moving on to whatever the next piece of work to submit is(Glover and Brown, 2006; Winstone and Boud, 2022; Henderson et al., 2019), whereas these authors argue that the most important factor when marking a piece of work is the feedback provided, citing that feedback is intended for improving learning and remedying weaknesses for future work.

Glover and Brown, 2006 specifically discusses the effectiveness of feedback, and their study on 2 universities found that the 4 conditions for effective feedback are met less frequently than the researchers initially thought. They express issues with the current systems which utilise feedback only as a vehicle to inform students of their accolades in previous assignments, rather than building on their previous works' weaknesses to provide a stronger platform to work from in the future and improve their overall learning. The researchers argue that this can be counteracted to some extent by simply shepherding markers towards writing their feedback with more explanatory comments, expanding on the 'why?' rather than just what requirements have and haven't been met, giving students more room to deliberate on and extrapolate future improvements from feedback even when assignments are not strictly related to each other. Winstone and Boud, 2022 and Henderson et al., 2019 continue to expand on this line of thought with the former arguing that there needs to be more of a separation of grading and feedback in order to address these problems with marking and feedback as their entanglement leads to the perception

that they are one and the same and serve the same purpose. They go on to explore many similar avenues as previous research such as the idea that feedback can come too late to be useful for students and that feedback is not a primary focus when a course is created, as well some new concepts such as the downfalls of anonymous grading, with survey respondents indicating that the found that generic, anonymous feedback was not useful for the individual as it becomes difficult to tailor feedback to the individual when work is submitted anonymously. Henderson et al. primarily discuss large-scale survey results in order to define a set of conditions that make feedback useful for students, beginning by stating that feedback is often under-utilised in higher education and define feedback as a process that should improve decision making from students to assist with improving learning outcomes, but is unfortunately used as mentioned to prevent student challenges and justify a grade.

When defining marking as a process it is important to also analyse feedback systems in place as in many modern systems, as literature suggests, these two processes are inherently intertwined - though many authors argue against this, the way the system works currently makes them difficult to separate as while many students may want to improve their own work and markers want to provide constructive feedback, the current system gears itself towards assignments which exist only to provide a grade and then pass the student onto the next one, giving little incentive for students to focus on improving weak areas of specific types of work and even less reason for graders to put significantly more work into giving feedback when marking is already a tedious process, especially with the scale of some courses which would make giving personal, extensive feedback impossible without overworking staff. This illustrates that there is a clear need to change key parts of grading systems in order to change the general perspective of what marking and feedback should be in higher education especially.

2.4 What tools are used in marking?

2.5 What are the benefits and disadvantages of different tools used?

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2.5.1 Sub Section

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Chapter 3

Methodology

3.1 Introduction

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Chapter 4

Results and Discussion

4.1 Introduction

For adding algorithm to your dissertation you can use following method:

Algorithm 1: Example code

Input: Your Input
Output: Your output
Data: Testing set x

```
1  ∑_{i=1}^{∞} := 0                                   // this is a comment
   /* Now this is an if...else conditional loop                          */
2  if Condition 1 then
3      Do something                                   // this is another comment
4      if sub-Condition then
5          Do a lot
6  else if Condition 2 then
7      Do Otherwise
       /* Now this is a for loop                                         */
8      for sequence do
9          loop instructions
10 else
11     Do the rest
   /* Now this is a While loop                                           */
12 while Condition do
13     Do something
```

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Chapter 5

Conclusion

5.1 Introduction

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Appendices

Appendix A

Perhaps Code

Appendix B

Questionnaire

Appendix C

Gantt Chart