

Using spreadsheets for e-Exam delivery

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Abstract

In this pilot study we set out to answer the research questions of - could a spreadsheet be used as a small-scale, do-it-yourself exam delivery and marking environment that was both autonomous and secure? And, would students accept this approach? We developed a set of spreadsheets and conducted a trial in a first year university level class during 2017. The approach enabled automatic marking for selected response questions and semi-automatic marking for short open ended questions but did so in a way that did not expose the assessment key on student computers. The system did not require a network or servers to operate during the exam therefore minimising the reliance on complex infrastructure at this critical time. Following the exam, retrieval of student responses from individual spreadsheet files used a many-to-one merge process into a gradebook file. The master gradebook spreadsheet contained the answer key that was used to assess student responses and generate basic descriptive statistics relating to performance. Student perceptions of the process were gathered from those undertaking a practice session followed by an invigilated exam. Pre-post surveys (n = 16) were used comprising qualitative comments and Likert items. The data revealed that students positively rated the experience with all items scoring 4 or above on a 5 point scale. Student's perceptions of the experience were influenced by how well the logistical aspects of running the exam were handled, the degree of technical issues encountered and their level of computer literacy relevant to the subject domain. In this case undertaking an exam in introductory Chinese as a foreign language meant that a student's knowledge of Chinese typing input methods compared to the ability to hand-write characters was important in their ability to easily undertake the e-Exam. This has wider implications for the taught curriculum where the affordances of the testing and learning technology environment is likely to backwash onto what is taught and how students are assessed in the subject domain. We utilised Live Linux bootable USB sticks across a mix of student BYO laptops and university owned laptops to provide a controlled, consistent exam environment for each candidate. There was no requirement for a network or servers and this meant that the teacher had autonomy in where and how they conducted the assessment whilst being able to take advantage of the efficiencies afforded by using computers for assessment processes. The marker estimated that they saved about 30% of the time it would have normally taken to grade paper responses due to the ease of reading typed responses, the automatic assessment of some questions, and iteratively adding to the marking key in the case of text response items. However, because this was a prototype we found that further work will be needed to refine the set of spreadsheets in terms of usability, further automation and in demonstrating the approach in other discipline areas.

Keywords: computer-based assessment, e-exam, spreadsheets

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