ESSAY EXAMS AND TABLET COMPUTERS – TRYING TO MAKE THE PILL MORE PALATABLE

Nora Mogey and Greg Sarab

Essay Exams and Tablet Computers – Trying to Make the Pill More Palatable

Nora Mogey
Media & Learning Technology Service
University of Edinburgh
Tel 0131 651 6163
Nora.Mogey@ed.ac.uk

Greg Sarab
CEO, Extegrity Inc.
Tel (USA) 415-255-2842
fax 801-912-2296
greg@extegrity.com

Abstract

Most students now complete most assignments using a computer. Word processing is standard. Yet when it comes to the end of the semester we still require most students to handwrite final examinations. Surely we can no longer claim this is an authentic assessment strategy?

At The University of Edinburgh we have been conducting trials to explore the potential for using computers in traditional examination settings. In itself, the concept is not unusual, as nearly all US law schools have been leveraging student-owned laptops on academic examinations for many years.

The additional feature we sought and have tested is the ability to sketch a diagram and include that with the text of the essay. We will briefly demonstrate the software and discuss evaluation results.

Student reaction has, predictably, been positive, but with some concerns and reservations in using the hardware/software and on issues of equity and fairness. Some found the very concept of including a diagram in an essay startling, while others thought it natural and desirable. All found it physically awkward to manipulate the tablet PC between use of the keyboard and the touch screen. Some expressed concerns about whether those students who can touch type are unduly favoured, and whether in fact this widens unfairly the inevitable inequalities between individuals, and their comments suggest it is necessary to consider differences in examiners expectations and decisions when presented with typed rather than hand written scripts. Most importantly,

support from the student body to continue to develop this approach is strong and consistent. It will not be suitable for all examinations in all subjects, but clearly this will be a useful tool for a wide variety of contexts.

Introduction

"The death of handwriting" was a recent eye-catching headline in a national newspaper (Jeffries, 2006). The article argued that although writing as a skill is valued and positively encouraged by government initiatives such as the handwriting element in the national curriculum, there is evidence children are not developing the early motor skills needed for fluent handwriting. Instead our young people are becoming "digital natives" (Prensky, 2001). As far back as 2002, 98% of UK children aged 5-18 used computers regularly (National Statistics Office). Increasingly we can expect our students to arrive at university with excellent technology skills, personally-owned equipment, and strong expectations that university will be a technologically advanced environment (Haywood et al 2004).

Questions can be raised about examinations and the contexts for which they are or are not an appropriate assessment tool (Rowntree, 1977; Howell, 2003; Harris, 2005). The present study assumes essay examinations will continue to feature in the assessment portfolio for some time and explores a primary method to introduce computers into that setting.

US law schools most commonly assess students via a single, high-pressure, 3-hour essay per course, and examinations have long been held on computer (Augustine-Adams et al 2001). Students typically provide their own laptops (a small number of school-owned computers are available at a few schools), and are responsible for installing and operating special exam software. This offers advantages of student familiarity with, and responsibility for, the machine used for testing. Test questions are normally distributed on paper, further maintaining the familiar traditional environment.

An essay in law, in common with many humanities subjects, will typically be largely text. This is not the case in all disciplines, especially the sciences, where it is usual to wish to include diagrams, sketches, graphs and the like in an essay response. The notion of using a tablet PC which could be used either to enter text or sketch a diagram seemed attractive. An exploratory project was successfully established as part of the Change Academy 2004.

Software Selection and Development

Initial investigations identified several pieces of software concerned with the collection of responses in an examination setting. The most pertinent tools provided a secure typing environment where no other applications could run concurrently, offered appropriate data encryption, and carefully saved and protected student work. We immediately discovered the security aspect was so effective that it also blocked the very tablet functionality we were keen to exploit. Upon explaining this problem to a number of vendors, Extegrity Inc.

agreed to collaborate with us to facilitate the inclusion of figures or sketches with a typed exam.

Evaluation

15 student volunteers participated in the evaluation held in January 2006.

The afternoon comprised a short overview of the project, time to practice using tablet computers owned by the University running Extegrity's specially enhanced Exam4 software, and a 1-hour written "exam". Students were observed during the exam and feedback was sought on paper and via two focus groups.

The "exam" was modelled on a traditional paper-based exam, with a printed question provided. Candidates launched the software and completed the initial administrative procedure up to a "Wait" screen. The invigilator verbally confirmed all students had successfully reached that screen, then invited them to turn over the exam question and proceed.

At the end of the exam the invigilator instructed the candidates to stop and follow the software's exit procedure. In this case student responses were submitted via USB flash drive but it could equally well be to a connected network drive or any other media desired. The saved files are encrypted and cannot be opened without a security key.

The student volunteers were mostly active members of the Edinburgh University Students' Association, although at least 2 were not. 6 were male and 9 female (of which 2 were mature students) representing 10 schools from 2 of our 3 colleges. Although this session was not advertised as being about use of computers, the group were highly computer literate. 3 had previously taken an examination using a computer.

Student Feedback

Observation suggested that despite the lack of practice students had few problems with the overall process. A clear recurring concern was that rotating the screens of the tablet PCs was time consuming, physically awkward and distracting both to others and one's own train of thought. Some additional functions were requested in the software (e.g.: bullet points, tables) and there was a desire to have the images embedded within the main body of the text. However, no one was worried about whether their work had been saved correctly.

The students were open to the suggestion of a sensible role for computers in essay exams. While broadly supportive of exploring this idea, perhaps even expressing a small amount of enthusiasm, there were also very strongly expressed reservations. Many were concerned about the impact of

differences in typing abilities, and all stressed that sufficient practice time would be critical. Discipline differences were evident, with mild confusion being expressed by some students as to why anyone would ever want to include a drawing in an exam. An easy to implement suggestion/request was to provide scrap paper for those who wished to use it.

Members of both focus groups stressed they had concerns about possible unfairness due to differences in typing skills, closely associated with concerns about how a typed exam might be marked differently to a handwritten exam, and that students would feel they had to go back and correct typing errors which they would just leave in a handwritten submission. Students did not view this unfairness as being equal or equivalent to any which is inherent to the current system with handwritten examinations.

There was no clear and consistent feeling about whether students would do better or worse on such an examination: some students welcomed the idea and others had significant concerns.

Conclusion and Future Directions

Despite broad encouragement from our student evaluators to continue this study there are some practical difficulties, particularly in accommodating drawing capabilities. Few students own tablet PCs, and it would be expensive to purchase a set large enough for a typical first- or second-year class.

Since so many students do own non-tablet laptops, a promising option is the provision or requirement of inexpensive peripheral USB tablet devices for exams. Other less favourable options include: proceeding only with "non-drawing" disciplines; allowing diagrams drawn on paper to be submitted with the examination script; and/or, restricting use of tablets to contexts where diagrams are integral and where student numbers match the resources available.

In the longer term it will be necessary to adopt invigilation procedures and general protocols for conducting this type of assessment such as already established in institutions where objective testing is well-embedded (ex:Uni Dundee).

It is recognised that further study is needed regarding the more psychological issues raised by the students (expectations about differences in marking handwritten scripts versus typed scripts; how students would actually spend the precious examination time if using a keyboard) before we could proceed to widespread adoption of this method of assessment. In this we can draw upon the experiences of US law schools and students, and Extegrity, veterans of hundreds of thousands of computer exams.

Whether traditional examinations are the future may be questionable.

Nevertheless this early test has been encouraging and well-received by our students, demonstrating it is possible to mix new technologies with old

assessment methods and perhaps make the bitter pill of examinations a little easier to swallow.

Acknowledgements

Initial planning for this project was undertaken with the support of the Change Academy.

The support and assistance of the Edinburgh University Students' Association and the individual students who participated in this evaluation was critical, and continues to be much appreciated.

References

Augustine-Adams, K. Hendrix, S.B. and Rasband, J.R. (2001) Pen or Printer : can students afford to handwrite their exams? *Journal of Legal Education,* 51,1, pp118-129

Harris, R. (2005) Testing Times: Traditional Examinations and Asynchronous Learning. *Journal of Geography in Higher Education*, 29, 1, pp 101-114

Haywood, J. et al (2004) The Student view of ICT in Education at The University of Edinburgh: skills attitudes and expectations. *ALT-C 2004 Proceedings*

Howell, S. L. (2003) e-Learning and paper testing: why the gap? *Educause quarterl*y, 4.

Jeffries, S. (2006) The death of handwriting, *The Guardian* 14 Feb 2006

National Statistics Office http://www.statistics.gov.uk/ (Accessed May 2006)

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon, 9*(5), 1–2.Available:www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf (accessed May 2006)

Rowntree, D. (1977) How to Assess? In *Assessing students: How Shall We Know Them?* Kogan Page

University of Dundee online assessment procedures http://www.somis.dundee.ac.uk/academic/caapolicy.htm (accessed May 2006)

Change Academy http://www.heacademy.ac.uk/923.htm

http://www.softwaresecure.com/pdf/PaperTests.pdf