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Using e-portfolios to provide regular feedback on final year statistics projects

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1. Introduction

An e-portfolio is, in effect, just a collection of information or documents which is presented in an online format. The use of e-portfolios for personal development planning and the development of skills for lifelong learning has been studied in depth (for example, [1] and [2]). However, we have found over the last six years that they are also useful as a tool for light-touch supervision of undergraduate final year statistics dissertations. They afford the 'supervisor', or module convenor/leader, the opportunity to monitor students from a distance, at a time convenient to their other commitments. Where a facility is available for adding comments to the e-portfolio, students can receive some light-touch supervision to keep them on track. This flexibility and convenience both mean that one member of staff can be in charge of several student projects, more so than in a traditional one-to-one supervised setting.

The use of e-portfolio tools in our final year statistics project is described below, together with details of the benefits that they afford. Since their use has been particularly positive because of the format of our project, this is described first.

2. The final year statistics project

At Reading all single subject statistics undergraduates must take a statistics project, which is weighted one third of the final year. The project has a key role to play in developing students' transferable skills (see e.g. [3] for a discussion of such skills).

Although once a 'traditional' project, where students would meet with their supervisor each week to discuss progress, in 2004, due to the student:staff ratio in the statistics department at that time, it became difficult to continue to provide one-to-one supervised projects for undergraduates. The project was therefore designed to be more student-centric, with students effectively taking control of their own supervision and independently determining the content (though under the watch of a single module convenor). Indeed, the resulting project very much moved up the ladder of student participation in curriculum design [4] in this regard, and the students undertaking the new version for the first time in 2005 commented that they liked the autonomy provided to them with regards directions to take.

The new project module as I designed it became, and still is, a more structured module than the traditional dissertation-only one. Students choose a dataset from a list, each one being attached to one of three or four different statistical topics which they have not met in any great detail in their degree at that point (e.g. survival analysis and time series analysis to name two). They are expected to carry out a statistical analysis of

the dataset using methods they have met in their other modules, and they are also expected to learn the new topic from books through self-study, and apply that to their data as well. They set their own research questions and can choose to focus on a subset of the data if they wish. In this way, skills of independent research are enhanced, as in effect the students are supervising themselves.

The assessment for the module is based on the final dissertation that they write (a 65-page limit; 75% weighting), a poster and its presentation (10%), a critical appraisal of another student's dissertation (10%), and a research diary with weekly entries summarising what they have done (5%). The research diary is not formally marked until the end of the project, but the weekly entries are formative because they provide the opportunity for monitoring progress and identifying if an obvious error has been made in the analysis that is reported. The purpose in its creation as a component of the project module was to encourage students to think carefully about what they had completed each week, and help form plans for the coming week. Obviously keeping a record of one's research is a useful project management skill, and the aim of the project is to develop a wide range of skills.

3. Use of e-portfolios

3.1 The research diary

My role, as module convenor, is to provide lectures on research methods, but also to monitor the progress of the students from a distance. The research diary is a key component of this. In 2005 the research diary was paper-based, and was handed in halfway through the module, and again at the very end. It therefore had little role to play in assisting with any light-touch supervision. Consequently, there were some errors in the final work the students submitted which might have been identified had a weekly entry been read.

An e-portfolio was used for the first time for the research diary in 2006, using the University's Virtual Learning Environment, *Blackboard*. Students were again encouraged to complete the diary weekly, to help them with their progress and for gathering their thoughts, but it was only read midway through the year again for feedback purposes. Consequently, engagement was not high.

In 2007 the comments facility in the e-portfolio tool in *Blackboard* was used to provide feedback at the end of each week on that week's diary entry. Students were also told that they needed to construct the e-portfolio such that it had a separate page for each week, because only the current week's entry would be read for feedback purposes (but that all entries could be changed later because formal marking would only take place at the end of the module). It was this use of the e-portfolio tool for providing regular feedback which made it a key component of the project module, and it has been used successfully in this way each year since then.

The e-portfolio research diary is the only way for students to get regular feedback on what they are doing, and also to ask (up to two) questions each week to help guide their studies. Feedback provided via the comments facility includes advice about structure of the dissertation (reinforcing what has been said in lectures), suggestions of what could be investigated (these tend to be generic to leave sufficient scope for the students to think about what they want to do in their analysis), reassurance that the completed and/or planned work that has been described is reasonable, highlighting of errors in the statistical work that has been described, advice about time and project management tailored to that individual, plus answers to statistical and other queries.

A natural question to ask would be about the benefit that the e-portfolio approach has over seeing students one-to-one for a very short period of time every fortnight for example. The answer to this is that the checking of the e-portfolios can be done, flexibly, at a time most convenient to the convenor, depending on other commitments, and that time spent reading the entries and providing comments is inevitably shorter than it would be if engaging in one-to-one discussions with an individual (where it is easy to get off topic). It also effectively encourages students to treat the module in the manner that it was intended, as essentially a student-supervised project, because their regular contact with the convenor and generation of feedback is happening remotely. They are encouraged to take more control over their project because they have to summarise online their weekly progress in an informative way in order to ensure that the feedback they receive is most beneficial to them.

In terms of benefits to students, the convenience that the e-portfolio brings means that they are able to get some regular individual feedback and light-touch supervision of their project by an academic, which they otherwise wouldn't be able to have purely for logistic reasons (student:staff ratios) if the only possibility was face-to-face. The act of having to think about what to report for that week is also a good research skill – to effectively summarise in one page of A4 what has been done, what has been found and what is going to be tackled next. This recapping process can also be effective in stimulating further ideas. Students themselves have noted that it is useful to re-read their diary entries, to see if they have achieved what they had aimed to do in previous weeks. Having the entries online makes them readily accessible for this purpose.

3.2 Student engagement

A common problem in the use of e-portfolios, particularly when the use is for personal development planning, is student engagement [2]. Certainly in 2006 we found that students saw the use of the e-portfolio for the diary component to be an unnecessary technological add-on. However, from 2007 when feedback started to be provided using the comments facility, student views were more positive, and engagement seemed to improve. Not

surprisingly, students identified the benefits of using the e-portfolio when they were receiving feedback via its tools.

To assess this quantitatively, we can look at the number of entries completed by students at the point of handing in the research diary (recall that they can change it and add missing entries at any point until the end of the module), and the content of the entries. To try to limit external influences such as student cohorts being too different in terms of entry qualifications and overall ability, nine students were chosen from each of the 2006/7 and 2007/8 academic years (the year when the e-portfolio had no weekly feedback provided, and the following year when it did). The nine students in each year were matched so that their final dissertation module mark was either the same or differed by only one mark (the range of marks achieved covered First Class to Third Class).

The mean number of diary entries in 2006/7 was 15.9, compared with 18.4 in 2007/8 (the maximum possible number is 19). Fig 1 shows a boxplot of the distribution of the total number of words written in the diary for the nine students in each of these years (all weekly entries combined). The p-value from a sign test applied to the differences for the matched students was 0.039, indicating a significant difference between the engagement levels of the two cohorts, as measured by words written. There seems to be some evidence of improved engagement in the second year of implementing e-portfolios.

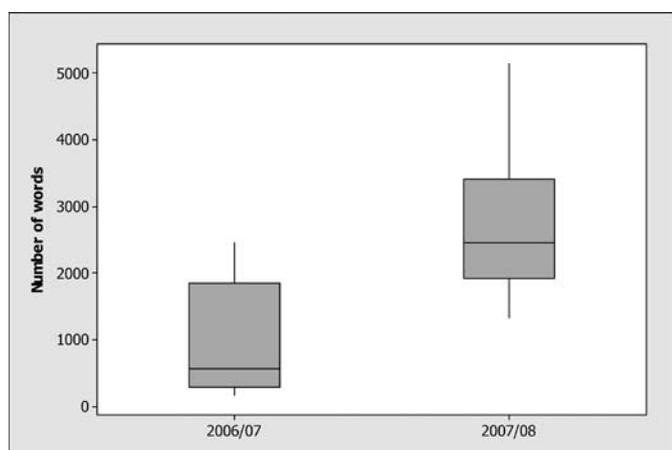


Fig 1 – Boxplot of the distribution of the total number of words written in the diary

It is of course impossible to say whether making use of the comments facility to provide feedback was the causal factor in the apparent increase in engagement seen between the two years. However, discussions with students at the time did suggest that they found the weekly feedback provided on the e-portfolio to be useful. Making use of such commenting facilities is clearly an important aspect to using e-portfolios for purposes such as projects. Indeed, students have similarly continued to write long entries in their research diaries in the years following, and have continued to comment favourably on the feedback they receive on their e-portfolio diaries.

4. Conclusions

We have been using e-portfolio tools successfully in final year statistics projects since 2006. Although their introduction was largely due to the format of our project, with its student-centric approach, they nevertheless have various uses that would benefit any project where light-touch supervision is provided. Indeed, the opportunity that e-portfolios provide for easily fitting in such 'supervision' with an existing workload means that in particular this is a useful tool when there are many more students than staff, making it difficult to offer a full one-to-one supervised project with weekly meetings.

Our experience is certainly that e-portfolios make it easy to give feedback to students on final year projects. Of course, the advantage of providing quick and useful feedback to students is that it encourages more use of the e-portfolio (students begin to seek more feedback with more detailed entries). This increased use then in turn enhances the quality of feedback that can be given (because there is more to comment on, particularly where students have thought more carefully about their entry). And obviously better feedback can lead to enhanced learning, and can enable students to develop the confidence to push themselves further, and achieve more than they would have otherwise achieved. This outcome fits perfectly with the goals of a final year project.

In conclusion, there are clear benefits to both staff and students from using e-portfolio tools in this way. Given our experiences over the last few years, we would definitely advise the use of e-portfolios as a simple and efficient means of monitoring student progress on final year projects.

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