

SPEAQ

*Student Perceptions
of E-Assessment
Questionnaire*



Student Perceptions of e-Assessment Questionnaire: Report

By John Dermo, University of Bradford, 10th June 2008

1. Introduction

As part of the e-learning Pathfinder programme into e-assessment at The University of Bradford, a survey of student perceptions was carried out in April and May 2008. This consisted of a questionnaire (SPEAQ) delivered to 130 students who had taken part in online assessment during the academic year 2007-8.

2. Dimensions

The survey looked at 6 main questions (or dimensions), based on the literature and through consultation with experts in the field of e-learning in general and e-assessment in particular, both within the institution and across the UK HE sector. The dimensions of the study were as follows:

- 1: Affective Factors (ie How do students feel during online exams - positive or negative? Does the fact that it is online affect their performance? Does it add to stress/anxiety or does it reduce it?)
- 2: Validity (ie Are the objective test task types associated with online exams appropriate for university studies?)
- 3: Practicality (ie What are the practical challenges of CAA? What benefits can it bring?)
- 4: Reliability (ie Is online assessment as fair as paper-based assessment?)
- 5: Security (ie Is online assessment a secure alternative to traditional paper-based assessment?)
- 6: Pedagogy (ie Does CAA have a positive part to play in learning and teaching at university?)

3. Indicators

Each dimension was then broken down into indicators, based on a priori thinking: these indicators were statements or questions that individually gathered data on one part or aspect of the dimension, using an adapted Likert scale. The idea was that when put together, these indicators should constitute a reliable measure of the dimension as a whole. It was inevitable that some of these indicators would overlap and it might also be argued that some of these indicators related to more than one dimension; however, that might be interesting rather than necessarily problematic, although too much tedious repetition in the questionnaire was avoided. Where an indicator was more "negative" an indicator (-) has been used, where it was positive, there is (+). This affected the way the questions were scored on the Likert scale. Also, there was a mix of (+) and (-) within each dimension, so as not to influence the subjects unduly. Each indicator corresponded to a single question on the questionnaire and the number of indicators was restricted to 5 per dimension. Exploratory factor analysis has been used to test out these hypothetical indicators.

Indicators for D1 "Affective factors"

- I1: Using a computer adds to the stress of exams. (-)
- I2: I expect computers to be used as part of assessment at university (+)
- I3: I'd feel more comfortable if the exam was on paper, not online.
- I4: I find it hard to concentrate on the questions when doing an online exam. (-)
- I5: I'd rather do exams on a computer than on paper, because I am used to working online. (-)

Indicators for D2 "Validity"

- I1: Online assessment is appropriate for my subject area. (+)
- I2: My subject area is too complex to be dealt with by online multiple choice questions. (-)
- I3: Online exams don't just test knowledge of the subject, but IT skills as well. (-)
- I4: Online exams have an important role to play in HE. (+)
- I5: Because you can guess the answer, online multiple choice questions don't really reflect your level of knowledge. (-)

Indicators for D3 "Practicality"

- I1: Online assessments use less paper, which is important to me. (+)
- I2: Technical problems make online exams impractical. (-)
- I3: There are serious health and safety issues with online exams. (-)
- I4: It isn't practical doing online exams in the computer clusters. (-)
- I5: Online exams are more accessible than paper-based exams. (+)

Indicators for D4 "Reliability"

- I1: Marking is more accurate, because computers don't suffer from human error. (+)
- I2: The technology used in online assessments is unreliable. (-)
- I3: Online assessments favour some students more than others. (-)
- I4: Paper-based exams are fairer than online exams. (-)
- I5: Randomised questions from a bank means that sometimes you get easier questions. (-)

Indicators for D5 "Security"

- I1. Online assessment is just as secure as paper-based assessment. (+)
- I2. I am confident that my grades for online assessments are secure. (+)
- I3. It is easier to cheat on online exams than with paper-based exams. (-)
- I4. The online exam system is vulnerable to hackers. (-)
- I5. Username and password login provide adequate security for online exams. (+)

Indicators for D6 "Pedagogy"

- I1. The potential for immediate feedback with CAA could help me learn. (+)
- I2. Online assessment can do things paper-based exams can't. (+)
- I3. Online assessment can add value to my learning. (+)
- I4. Online assessment is just a gimmick that does not really benefit learning. (-)
- I5. Online assessment goes hand-in-hand with e-learning (eg using Blackboard). (+)

4. Results

4.1 Respondents

The survey was completed by a random sample of 130 undergraduates from 6 different academic schools. Ages ranged from 18 to 43 (mean = 21.26), with 69% of the students were in the age range 18-20 and 31% in the over 20 category. 68% of the sample were male, 32% female.

All the students had taken part in some form of online assessment in 2007-8. 92% of the students had taken part in formative assessment, and 41% had done online summative assessment (so about 33% had done both formative and summative).

4.2 Findings on indicators

Before looking at the findings related to the dimensions discussed above, attention will be paid to the specific indicators. Of the 30 indicators in the questionnaire, 20 received positive responses from the students, there were 4 clearly negative responses, and 6 were neutral; this is based on the five point adapted Likert scale, where the mid-point 3 can be seen as a neutral position, and a mean value above this can be seen to be positive and a mean rating below 3 is negative.

The main four concerns from the students with regard to online assessment are as follows, in order from the greatest concern down (mean ratings in brackets):

- Randomised items from question banks are unfair (2.66)
- Technical problems make online exams impractical (2.77)
- Online exams test IT skills as well as subject knowledge (2.85)
- I'd rather do exams online because I am used to working online (2.85)

There were a number of responses very close to the mid-point of 3: these can be taken to be neutral responses from students. Perhaps these can be taken as an indication that there is not a great perceived difference between paper-based or online exams:

It is easier to cheat online (2.9); I am more comfortable doing exams on paper (2.96); Online exams are vulnerable to hackers (2.96); Online exams save paper (2.96); Paper-based exams are fairer than online exams (3.06); PC based exams favour some students more than others (3.08).

There were many positive responses from students: there were no serious concerns about health and safety issues (3.82); using a computer does not add to the stress of exams (3.54); CAA is not just a gimmick – it does add to learning (3.45) and goes hand in hand with e-learning (3.44) and enables new ways of learning (3.24); students are confident that grades are secure (3.43) and say that feedback from CAA helps students learn (3.41). Login security is OK (3.40), the cluster rooms used for CAA are OK (3.12) and the technology used is reliable enough (3.12) and secure (3.25). CAA is suitable for the students' subject (3.39) which is not too complex to be tested by CAA (3.29), and they expect online assessment at university (3.36). CAA allows more accurate marking (3.32), adds value to learning (3.28) and increases accessibility (3.25). Guessing is not a serious factor (3.22), CAA is appropriate for HE (3.16) and concentration is not a major issue (3.14)

4.3 Findings on Dimensions

When the student answers from the indicators are combined to make overall ratings on each of the six dimensions, the results make very interesting reading. It is clear that the most positive aspect of online assessment in the eyes of students is concerned with the pedagogic benefits of CAA towards teaching and learning. Dimension 6 (pedagogy) had by far the highest rating (3.36) of all (see figure 1).

How Does Online Assessment Contribute to Teaching and Learning?

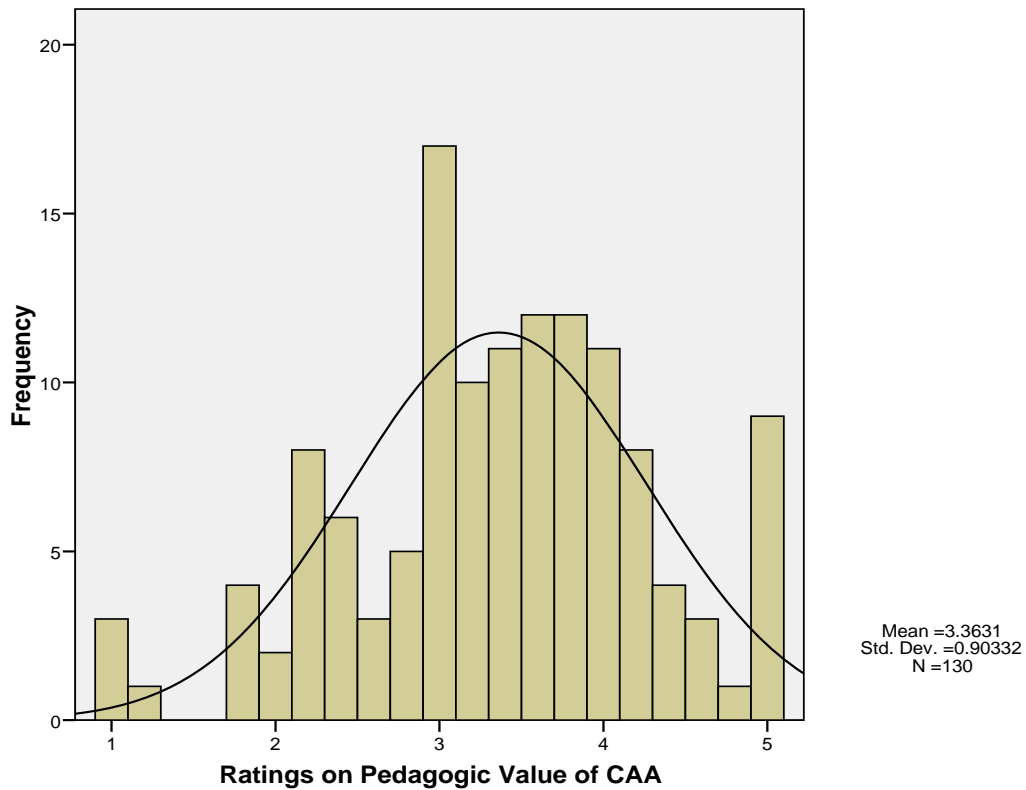


Figure 1: Histogram showing ratings on Dimension 6

The lowest rating came in the dimension “reliability” (3.05), although this is still slightly above the mid-point, so this is to be taken as a neutral response. All the other 4 dimensions (validity, practicality, security and affective factors) received very similar mean ratings of approx 3.18. Whilst not overwhelmingly positive, this does suggest a blanket general acceptance of the main features of CAA.

In fact, one look at the overall ratings on the survey confirms this general trend (see figure 2). There are a small number of students with clear negative feelings, a somewhat larger number who are very pro-CAA, but the vast majority of students are grouped around the mid-point. Whilst one is reluctant to suggest that this is an example of normal distribution, it is apparent that this does approximate a Gaussian curve.

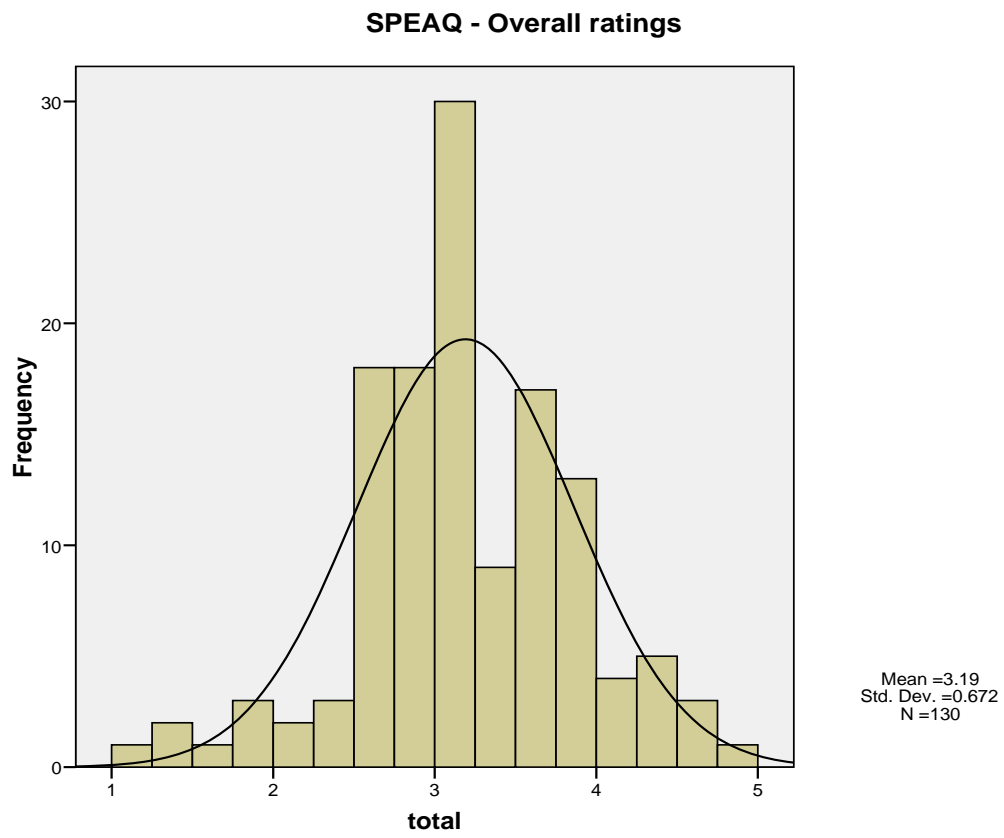


Figure 2: Histogram showing overall ratings for the whole questionnaire

4.3 A few words about Factor Analysis

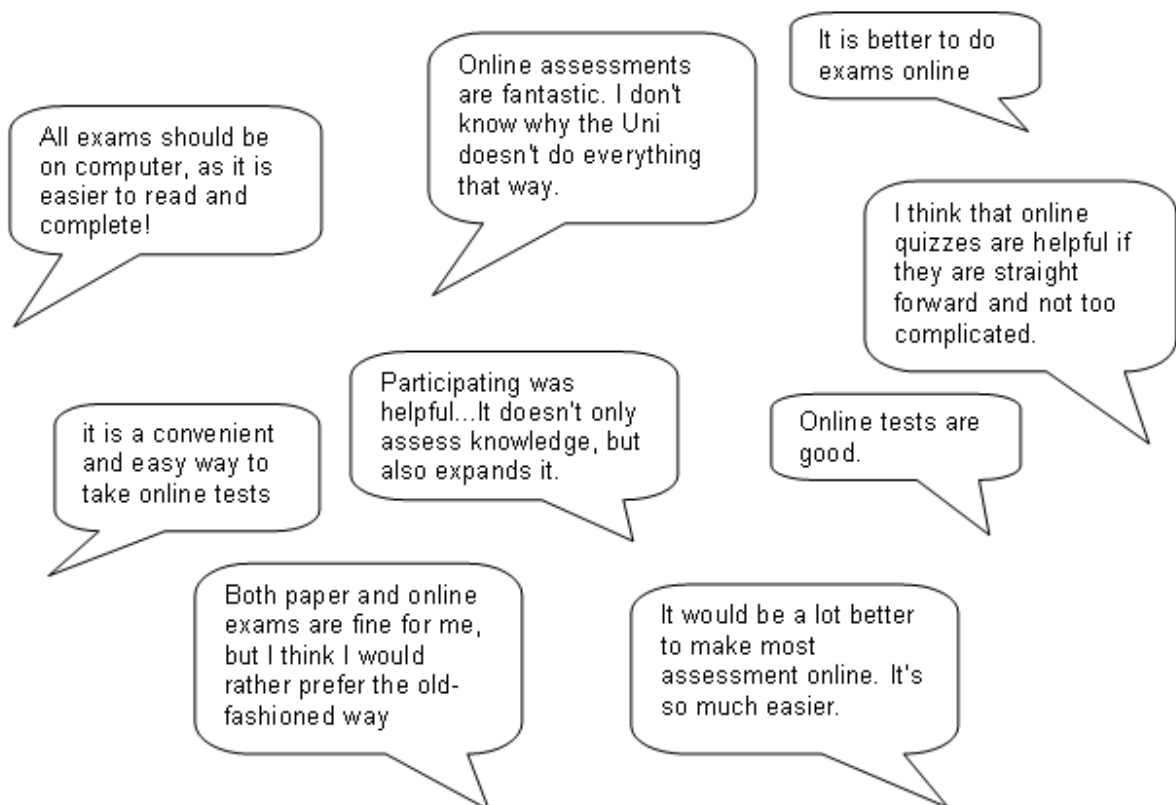
Exploratory Factor Analysis (Principal Component Analysis with Varimax rotation) was carried out to establish whether the responses of the students on the indicators did support the theory that these indicators would illustrate latent factors corresponding to the 6 dimensions. The results were mixed: D1 Affective factors, and D6 Pedagogy did show high levels of correlation, D4 reliability and D5 Security showed quite good correlation, but there was no real evidence to suggest that D2 Validity and D3 Practicality were latent factors. On reflection, this is perhaps not at all surprising, as these 2 dimensions were without doubt the most miscellaneous and varied and the amount of overlap between the two was great.

It is suggested that when using the data from this questionnaire as evidence to support student attitudes towards online assessment, it is justifiable to use the collated data from D1 and D6 to illustrate student attitudes on these dimensions. When referring to D4 and D5 D4I1 and D5I3 should be omitted, as they do not load on the component at the 0.4 level. D2 and D3 did not emerge as identifiable factors: however, that does not invalidate the individual questions, and the individual data is still of great value.

5. Qualitative Data

Because this survey was all about gathering data on student perceptions (ie subjective, qualitative data, not hard, objective facts) it might be argued that all the data gathered in this survey is qualitative in nature. However, because most of the data reported in the above sections was based on collated statistics from Likert scales, it might best be referred to as pseudo-qualitative or even quantitative. The researcher was conscious that there is a risk in approaching fundamentally quantitative data in an essentially quantitative way: consequently, open-ended questions were also included to give the subjects the opportunity to express themselves fully.

A selection of these unprompted comments is given below as an indication of a range of opinions held by students about online assessment. No effort has as yet been made to tag or code this in a systematic way; nor is it assumed that the range of opinions expressed here is typical of the sample as a whole – the quotations merely serve to give a general impression of student opinion.



6. Conclusions

What can be deduced from the analysis carried out to date is that whilst there are concerns about CAA which cannot be ignored, the general feeling among students is positive. Student concerns about the reliability of item banks and technology and the content validity of exams using IT must be borne in mind, and it should not be assumed that all students are automatically pro-IT. However, there are not major concerns that need us to make radical changes to policies and it is felt that this evidence, although not absolutely conclusive, supports the progress that has been made to date in this area.

Further work has yet to be done about breaking down the data by gender age and school, however, initial analysis suggests that with a sample of this size, we should not expect to find significant differences in responses between the groups.