

# **Closed book, invigilated exams versus open book, open web exams: An empirical analysis**



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This paper reports on the latest findings of an on-going research project evaluating the effectiveness of 'open book, open web' (OBOW) examinations. An assessment instrument used in a growing number of higher education institutions around the world, the OBOW examination model under consideration in this project is distinguishable by its firm commitment to the notion of authentic assessment, and the harnessing of the information and communication technologies to bring the 'examination paper' to life. The results of previous research undertaken have indicated that the OBOW approach receives the strong endorsement of students on a number of fronts, not least the quality of the learning outcomes. Scepticism remains, however, on the part of some traditionalists within educational circles who argue for the retention of invigilated examinations as this is the only means of ensuring that a student's work is their own and theirs alone. This paper opposes this position, presenting the case for an examination instrument that is more in keeping with modern learning theory.

Keywords: Authentic assessment, constructivism, open book examinations.

## **Introduction**

After very little change in the university sector for several centuries, there has been something of a 'mini-revolution' in the last quarter of a century or so. The student profile has changed socially, culturally, and economically with the 'massification' of higher education (Carrier, 1990), and there has been spectacular change in the area of educational technology. These changes have been reflected in professional journals and conferences dedicated to teaching and learning which have produced a steady stream of literature reporting on a wide range of research projects including, among other things, experiments with new classroom techniques, modes of flexible delivery, online pedagogies, and the increasing use of multimedia (see, for example, Sims 2004). Yet despite the quite momentous transformation that has taken place, one aspect of university life has barely changed at all; namely, the end-of-semester examination.

Indeed, the final examination is a university institution that would appear to be off-limits as far as innovation is concerned. To put this into context, while faculty and students alike will not stray too far from a computer as they go about their daily business (or anyone else in the world of business or commerce for that matter!), it is still the norm for examinations to be conducted using pen and paper. This is an anachronism in itself, but more importantly, as an assessment instrument a closed book, invigilated exam – still the most commonly administered in universities today – is at odds with modern learning theory. As this paper will argue, the rationale for the retention of a closed book, invigilated examination is decidedly shaky. To support this position, the latest evidence from an ongoing research will be presented which shows an 'open book, open web' (OBOW) exam to be a superior assessment instrument on a number of dimensions. Significantly, opportunities for cheating are deemed to be roughly equal. The paper concludes, therefore, that in the absence of a perfect solution, the best alternative is to opt for the assessment instrument that delivers the superior learning outcomes.

## **Context**

U21Global is a completely online university servicing approximately 4000 students in around 60 countries. In operation since July 2003, it is backed by Universitas 21 (U21), a network of 20 research-oriented universities spanning four continents. The U21 universities (which include University of Melbourne, University of New South Wales, University of Queensland, University of Auckland, and National University of Singapore) set the quality assurance benchmarks for all aspects of course delivery, including appointment of faculty, development of content, and monitoring of assessment standards. One of the hallmarks of the U21Global operation has been the firm commitment to a constructivist pedagogy where the learner takes centre stage. Following Biggs (1999), there is

'constructive alignment' of pedagogy, curriculum and assessment in that a case-based, problem-solving approach is integral to an authentic assessment regime. This was not always the case, as when classes first commenced, a closed book, invigilated examination was a mandatory element of all courses. This changed in May 2004, when it became clear through feedback from faculty and students alike that this examination model was failing as a summative assessment instrument because it was not consonant with the constructivist pedagogy pervading U21Global courses and the attendant case-based, formative assessment regime. The OBOW model was trialled, and adjudged a success following evaluation (see Williams, 2006; Lam et al. 2007) and has been in use ever since.

## **Characteristics of OBOW**

The defining characteristic of the OBOW approach is a commitment to authentic assessment (see, for example, Wiggins 1998, and Herrington and Herrington 1998). It fosters understanding of learning processes in terms of real-life performance as opposed to a display of inert knowledge, and learners are presented with unstructured problems that require the application of relevant skills and knowledge, rather than selection from predetermined options as is the case with multiple-choice tests, for example. Most importantly, it is a model that engages students which, in turn, educes deeper learning.

While each OBOW examination is unique, one common feature is that the learner is placed in the role of decision-maker (e.g. auditor, consultant, or advisor). This is a critical element of the OBOW model, as role play provides an effective bridge between a learner's education and their professional practice; the role of 'expert witness' serving as a useful mechanism for the validation of a student's learning in their own mind. Another critical element is that at the heart of every OBOW exam is a contemporary real-world problem brought to life through the use of hyperlinks to web sites and streaming media that serve to enhance the authenticity of the problem.

The OBOW model uses a very simple template which incorporates the design principles outlined above (see Williams, 2004). The main objective is to produce a mini-case ('The Context') that gets students to think conceptually about a problem, applying the skills and techniques they have acquired in their study of the course in question. Having set this context, the definition of the assessment task ('The Task') might amount to no more than a paragraph or two which describes the role the learner must act out. The 'Guide to the Task' that follows the assessment task definition is not to 'spoon-feed' the student but to ensure that the task is not so unstructured that the student is either struck by 'writers' block' or they fundamentally misinterpret the problem.

The final section of the template gives very specific instructions about preparation and submission of the student's response which deter unethical practice on the part of the student. The work must be submitted electronically to permit use of plagiarism detection software but, more importantly, the student's answer must make direct references to course-specific materials. This means that an accomplice would first have to become familiar with the subject materials, made more difficult given the time period allowed to complete the task is sufficiently tight. Meanwhile, buying an assignment from an on-line 'cheat site' is not an option given the task is unique and highly contextualised.

In summary, the OBOW model represents a serious attempt to engage students rather than alienate them. The opportunity for academically dishonest practice is less because of the way these examinations are structured, but so is the temptation to resort to this kind of behaviour in the first place. Students readily relate to the task that lies before them as they can see the point of it. By contrast, the closed book, invigilated exam encourages a strategy of 'cramming' the night before and 'data-dumping' on the day, with little knowledge retention thereafter. The OBOW exam, meanwhile, is thoroughly grounded in an authentic context, and learners have an opportunity to apply their newly constructed knowledge in a meaningful way.

A position frequently adopted by those defending the continued use of closed book, invigilated final examinations is to state that students will cheat unless they are supervised. This assumes (i) that cheating is an easy thing to do within the OBOW model, and (ii) students do not cheat in invigilated examinations. Both assumptions are challengeable, and have been tested in earlier research (Williams, 2006) and the current project reported here.

## **Methodology**

Earlier research conducted three months after the launch of the OBOW format surveyed all students who had completed both formats of examinations offered by U21Global. This preliminary study made use of a

10-question online questionnaire that focused on the relative merits of each. Broadly speaking, the questions focused on the relative depth of learning, real world relevance, the congruence of the examination instrument with U21Global pedagogy, the time allowed for the examinations, overall preferences regarding examination format, and the opportunities for plagiarism and cheating (Williams 2006). In this study (n= 54) all students either agreed (27%) or strongly agreed (73%) that, overall, OBOW examinations were preferable to a closed book, invigilated examination format. The other options on the five-point Likert scale (strongly disagree, disagree, and neither agree nor disagree) receiving no votes. Indeed, all of the results were similarly resounding in their endorsement of the OBOW model. On the issue of opportunities for plagiarism and cheating, many students took a neutral stance. Overall, results indicated that it might be slightly more difficult to cheat in the OBOW situation, but this was not deemed significant; there being roughly equal opportunity in the view of the students.

In the current study (June 2007), the same dimensions were explored as in the pilot study, but with an improved methodology and a larger sample size. The main difference was that the same questions were posed in relation to each exam instrument with a view to conducting a gap analysis of the average scores to ascertain the relative importance of each dimension. (In the earlier study, respondents were presented with a single set of questions; each question including reference to both OBOW and closed book exams.) In addition, qualitative data was elicited, where students were asked to provide further comments with regards to each question. Data was collected over a period of three weeks and participants were students from U21Global who had taken at least two subjects since the commencement of their programme. The participants were recruited via an email message, inviting them to take part in an online survey which would take approximately 10 minutes to complete. In addition to the actual email, two reminders were sent at one week intervals. The survey comprised 18 items; nine items were solicited with regard to a closed book, invigilated exam model, while the other nine items applied to the OBOW exam model. A total of 91 (13.1 percent) students responded to the email invite. Eighty five percent of the respondents were male, most of them (59.1 %) were aged between 30-39 years old; 30.7 percent of them had completed two to five subjects at U21Global, while 29.5 percent of them completed more than 13 subjects. The profiles of the respondents were similar to the actual profiles of students at U21Global.

## Results

The results of the 2007 study reflect the findings of the 2004 study in that – in the judgement of the students – OBOW is superior to the closed book, invigilated option on all counts. On the issue of opportunities for cheating, the result is also the same; namely, that there are broadly similar opportunities. This is counter to the commonly held view that information technology provides new situational opportunities for dishonest behaviour (e.g. McMurtry, 2001), and that, as a result, cheating should be made easier, faster, and more convenient, as students can share exam information via chat rooms, plagiarise from the Internet, or share exam questions via email between classes (Kleiner and Lord 1999). This view has been supported in a study conducted by Chapman *et al.* (2004) which reported that a relatively high percentage of students have already been involved in academic dishonesty in a web-based testing situation. In this study, even though OBOW was ranked slightly higher on this occasion (the reverse being true in the pilot study), the difference is small and, at .2, the smallest difference registered of all the dimensions being considered.

**Table 1: Closed book, invigilated exams vs OBOW exams: A gap analysis**

Dimension of examination instrument	Closed Book (a)	OBOW (b)	Gap (b-a)
Time allowed for exam (3hrs vs 24 hrs)	3.49	4.19	.7
Location (specific time/place vs flexible)	2.63	4.59	1.96
Aligned with pedagogy	3.58	4.34	.76
Quality learning outcomes	3.15	4.30	1.15
Intellectually challenging	3.51	4.49	.98
Suited student's learning style	3.06	4.43	1.37
Format relevant to business/professional education	2.95	4.42	1.47
Exam content engaging	3.38	4.41	1.03
Structure meant students could cheat	2.63	2.83	.2

Note: 5-point Likert scale scoring system used: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree

While cheating does not emerge as an important indicator, factors which are considered most important in favour of OBOW are flexibility regarding the location of the exam (+1.96), a format relevant to business/professional education (+1.47), suited to student's learning style (+1.37), quality of learning

outcomes (+1.15), and intellectually challenging (+.98). The findings highlight the importance of authentic assessment principles, such as the incorporation of real-life learning process and unstructured problems that require the application of relevant skills and knowledge. This further engages students and inculcates deeper and enriched learning.

## **Summary and conclusion**

University examinations continue to be dominated by closed book, invigilated pen and paper tests. It is argued here that this is something of an anachronism given the human capital needs of a knowledge economy, not just because of the absence of technology that is used routinely in every day business and commerce, but because this type of examination instrument is incompatible with constructivist learning theory that favours deep learning. It is further argued that a commitment to authentic assessment will pave the way for a different type of final examination, where real-world problems are allowed to take centre-stage, and multi-media can be harnessed to provide the learner with a more engaging experience. With greater engagement, this, in turn, can yield better results in terms of the depth of student learning.

An ongoing research project with an open book, open web examination format at U21Global has yielded positive results in terms of student perceptions of this examination instrument compared to the invigilated, closed book type exam. Importantly, OBOW is a transferable model that can just as easily be administered in an on campus setting as online, and while there will always be a small number of students who will cheat, the main priority should be to focus on the higher quality learning outcomes of the majority, rather than set up an entire system to stop a small minority. Certainly, if there is roughly equal scope for cheating (as the results of two student surveys would seem to suggest) then it would make sense to opt for the model that maximises student learning.

A limitation of this study involves the methodological considerations pertaining to measurement issues, sampling units, and the number of variables investigated in this study. Subsequently, this limits the generalisability of the findings reported. Hence, replications with more representative samples of respondents and extensions of measurement scales are planned for the future.

## **References**

Biggs, J (1999). *Teaching for Quality Learning at University*, Oxford University Press, Oxford.

Carrier, D. (1990). Legislation as a stimulus to innovation. *Higher Education Management*, 2(1), 88-98.

Chapman, K. J., Davis, R., Toy, D. & Wright, L. (2004). Academic integrity in the Business School environment: I'll get by with a little help from my friends. *Journal of Marketing Education*, 26 (3), 236-250. <https://doi.org/10.1177/0273475304268779>

Herrington, J. & Herrington, A. (1998). Authentic assessment and multimedia: How university students respond to a model of authentic assessment. *Higher Education Research and Development*, 17(3), 305-322. <https://doi.org/10.1080/0729436980170304>

Kleiner, C. & Lord, M. (1999). The cheating game. *U.S. News & World Report*, 127 (20), 54-63.

Lam, W., Williams, J. B., & Chua, A. Y. K. (2007). E-xams: harnessing the power of ICTs to enhance authenticity. *Educational Technology & Society*, 10 (3), 209-221.  
[http://www.ifets.info/journals/10\\_3/14.pdf](http://www.ifets.info/journals/10_3/14.pdf) [viewed 9 Aug 2007].

McMurtry, K. (2001). E-cheating: Combating a 21st century challenge, *Teaching and Higher Education Journal*, 29 (4), 36-41.

Sims, R. (2004). Trends, fads and futures: 21 years of educational multimedia: Where have we got to, and where should we go? *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2004* (pp. 3755-3766). Chesapeake, VA: AACE.

Wiggins, G. (1998). *Educative Assessment*. San Francisco: Jossey Bass.

Williams, J.B. (2004) Creating authentic assessments: a method for the authoring of open book open web examinations. In R. Atkinson, C. McBeath, D. Jonas-Dwyer & R. Phillips (Eds), *Beyond the Comfort Zone: Proceedings of the 21st ASCILITE Conference*, pp. 934-937.

Williams, J.B. (2006) The place of the closed book, invigilated final examination in a knowledge economy. *Educational Media International*, 43(2), 107-119.  
<https://doi.org/10.1080/09523980500237864>

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**Please cite as:** Williams, J.B. & Wong, A. (2007). Closed book, invigilated exams *vs* open book, open web exams: An empirical analysis. In *ICT: Providing choices for learners and learning. Proceedings ascilite Singapore 2007*. <https://doi.org/10.65106/apubs.2007.2536>

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