

## E-xams: harnessing the power of ICTs to enhance authenticity

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### ABSTRACT

Within an authentic assessment regime, a student is evaluated in terms of their ability to demonstrate application of a body of knowledge to a scenario situated in an actual, or a near replica of a real-world context. At Universitas 21 Global (U21Global), a completely online graduate school backed by 16 universities from around the world, the entire pedagogical model is founded on such an approach. One unique feature of the U21Global model is its interactive examination instrument which harnesses the power of the various information and communication technologies (ICTs). This instrument, referred to as the Open-Book Open-Web (OBOW) exam, presents students with a description of a simulated business problem using multimedia. They are then asked to assume a particular role and make recommendations about how to go about solving the problem. Feedback to date indicates that students are generally very positive about OBOW exams. On the minus side, the construction of OBOW exams presents a number of challenges. Not least of these is the steep learning curve it presents for exam authors unaccustomed to working within this paradigm.

### Keywords

Authentic assessment, Examinations, Constructivism, ELearning

### Introduction

In recent years, there has been a growing interest in authentic assessment (see, for example, Svinicki 2005; Laurillard 2002; Hanna 2002). This is largely fuelled by the realisation that traditional assessment, which relies on indirect, simplistic or proxy items to make inferences about a student's performance, no longer provides (if it ever did!) an adequate and realistic measure of knowledge (and its application) in a fast-changing world. In an authentic assessment setting, a student is evaluated in terms of their ability to demonstrate application of a body of knowledge to a scenario situated in an actual, or a near replica of a real-world context.

Wiggins (1998) notes that authentic assessment often involves 'ill-structured' challenges and roles that help students rehearse for the complex ambiguities of real life. Authentic assessment focuses on students' analytical skills, the ability to integrate new learning, and gives equal weight to the *process* as much as the finished product. Arguing in a similar vein, Mueller (2005) identifies several benefits of authentic assessment. First, authentic assessments are direct measures of a student's ability to apply knowledge and skills. Second, authentic assessment encourages a constructivist approach to learning, where students learn through application. Third, authentic assessment gives students considerable freedom to demonstrate what they have learnt without being limited to a particular set answer. Authentic assessment is particularly relevant to applied disciplines such as business, where a student may be assessed on their ability, for example, to develop a marketing strategy for a company rather than critique a theory of market segmentation.

The use of business cases and problem-based learning found in many graduate schools can be construed as a form of authentic assessment (Savery and Duffy 1995). However, by and large, these paper-based cases are very static, and fail to harness the liveliness that can potentially be brought about by the inclusion of multi-media elements. Indeed, given the advent of the information age and the Internet, it is surprising that cases are still presented in a traditional format. Furthermore, because of the time needed for publication, cases tend to be at least one year old and often do not capture important topical issues emerging in the subject area. Importantly though, once published, the 'answer' to a case readily surfaces in the public domain, so calling into question the use of those cases as an instrument for a student's final examination.

The School of Business at Universitas 21 Global (U21Global), one of the new breed of online academic institutions, has been using authentic assessment in its MBA program since it commenced operations in mid-2003. This paper reports on the overall experiences of U21Global with authentic assessment, specifically with a unique final examination instrument it has developed, known as the Open-Book Open-Web (OBOW) exam. While there may be individual professors working in other institutions, such as in the Wharton School of Business (Cole 2006), who are giving their students real-life cases to analyse as part of their final examination, these appear to be less well developed as an authentic assessment instrument as OBOW exams. Furthermore, U21Global is distinctive in that OBOW exams are an institution-wide approach to final examinations that is mandatory to all subjects, not just a select few.

The paper begins with a brief overview of U21Global. This is followed by a description of the assessment regime at U21Global and how OBOW exams are constructed and delivered. The lessons learnt from experience with OBOW exams and their implications are then discussed. The paper concludes that authentic assessment in the form of OBOW exams is a positive step from a pedagogical standpoint but the acceptance and successful implementation of such a model is contingent upon some form of training/ professional development for exam authors.

## **The Context: Universitas 21 Global**

### **Organisational overview**

U21Global is a joint venture between Thomson Learning, one of the world's largest publishers, and Universitas 21 (U21), a network of research-oriented universities spanning four continents. Nineteen of the U21 universities have an equity stake in U21Global including McGill University, University of British Columbia, University of Virginia, Tecnológico de Monterrey, University of Birmingham, University of Edinburgh, University of Glasgow, University of Nottingham, Lund University, University College Dublin, University of Melbourne, University of New South Wales, University of Queensland, University of Auckland, National University of Singapore, Korea University, University of Hong Kong, Shanghai Jiao Tong University, and Fudan University. U21Global is head-quartered in Singapore, with regional offices throughout the Asia-Pacific.

U21Global commenced, first of all, with the MBA program, and offered its first classes in July 2003. This program (including students enrolled in associated diploma, certificate and single subject programs) has since attracted nearly 2000 students. The typical profile of a U21Global MBA student is a working adult in a middle management position. The average age of students is 35 years old, average work experience is 11 years, and the majority are married (72%). No fewer than 83% travel to other countries in the course of their jobs. Singapore, India and the Middle East countries supply more than half of the students, but there are more than 50 different nationalities on the program in total.

### **Overall learning design**

Programs offered by U21Global are delivered entirely online; i.e. there is no face-to-face classroom study. Subjects last for 12 weeks and there is an expectation that, on average, students will spend 10 to 12 hours studying per week per subject. Since students are geographically dispersed among many different time-zones, interaction is largely asynchronous through discussion forums and email housed within U21Global's learning management system (LMS). However, students may also use synchronous tools such as online chat and audio conferencing.

The online courseware integrates with a prescribed textbook (although subjects are not textbook-driven) and exploits the power of the Internet to deliver text, graphics, interactive exercises, animations, downloadable resources, and hyperlinks to web sites. There are no lectures as there are in the conventional classroom. Indeed, this is a pedagogy that is quite at odds with the constructivist approach favoured by U21Global. While each class is led by a professor who maintains a presence throughout the duration of the class, he or she is the 'guide on the side' rather than the 'sage on the stage'. Students exercise considerable control over the direction of their learning and navigate their way through the web-based materials, accessing the electronic library when necessary, and only drawing on the expertise of the professor in an advisory capacity.

Importantly, there is a strong emphasis on peer learning, not least because the student demographic is such that they clearly have a lot to learn from one another given the diversity of professional experience, nationalities and cultures. Aside from the extensive interaction on discussion boards, there is considerable opportunity for students to collaborate through team assignments and projects (all individual contributions being subject to peer assessment), which help to contribute to the development of a robust online learning community.

### The assessment regime at U21Global

All U21Global MBA subjects feature four assessment instruments; namely, written case study assignments, discussion board contributions, a final project and a final examination. The description of these instruments and their relative weights are shown in Table 1.

*Table 1: Assessment instruments*

<b>Assessment Instrument</b>	<b>Description</b>	<b>Weighting (% of overall mark)</b>
Case analyses	Students complete up to 4 business case analyses (at least one as a member of a team, and at least one on an individual basis).	30
Discussion boards	Students are assessed on the quality of their contributions to discussion boards (according to 4 'categories of interaction' (MacKinnon 2000))	30
Final project	Students complete a major business case analysis, usually as a member of a team.	15
Final examination	Students are given an OBOW examination. This exam must be passed in order to pass the subject overall.	25

From the outset, U21Global committed itself to a case-oriented, problem-based learning approach where student learning would be firmly grounded in reality. Assignments and discussion topics are incorporated extensively into the courseware at logical junctures to help students reinforce learning. Assignments primarily take the form of business cases drawn from Harvard, the Ivey School of Business or the European Case Clearing House (ECCH) while discussion topics usually take the form of contentious or open-ended issues that seek to solicit a multiplicity of views from students. Typically, half of the assignments require students to work in teams of three to five. The final project, submitted at Week 12, may also be a team assignment. In Week 14, two weeks after the class ends, students are required to sit the final exam.

After a year of experience with this assessment regime, it became clear that there were inherent structural problems. It was U21Global's intention to model the final exam format and conditions as closely as possible after those found in traditional universities. The final exam was originally designed as a 3-hour exam which comprised multiple-choice questions and short-answer questions, and it was administered in a proctored environment by Prometric, a Thomson-owned company, which operates test centres throughout the major cities in the world.

However, it became increasingly evident that the existing examination instrument had serious operational and pedagogical shortcomings. Scheduling final exams for a rapidly growing pool of students from all over the world became a logistical challenge. More significantly, the final exam format was not consistent with U21Global's preferred pedagogy; that is, there was a lack of what Biggs (1999) refers to as 'constructive alignment'. First of all, an objective of the U21Global MBA program is to develop strategic problem-solvers in the workplace. The approach used in the existing final examination was considered inappropriate to further this goal. Second, the conditions under which the existing examination was conducted were far too remote from those in the real-world. The 3-hour exam gave students little time to ponder, investigate and reflect on realistic business problems. Rather, the short time fostered 'quick-fixes' and memorisation rather than encouraging deep-thinking and integration of learning. For these reasons, U21Global turned instead to an approach founded on the principles of authentic assessment introducing what it calls OBOW exams.

## **Authentic assessment and OBOW exams**

### **Defining characteristics of the OBOW examination instrument**

The OBOW exams used at U21Global represents a significant departure from the conventional, closed book, invigilated model for examinations in that they not only leverage the rich media resources available through the World Wide Web, they are also situated in an authentic context. In keeping with the constructivist tradition, the OBOW exam comprises a case-story that invites students to draw upon all they have learned throughout the subject, and in assembling this knowledge, they demonstrate what they know rather than what they do not know. There is no call for individuals to memorise and regurgitate facts and concepts in a controlled setting. Such case-stories are recognised as powerful learning instruments as well as assessment instruments (Hung et al. 2004).

Students can complete the OBOW exam at any physical location of their choosing within a 75-hour window over a designated weekend (usually the end of week 14). Once the OBOW exam paper has been downloaded from the U21Global LMS, the students have 24 hours to submit their response (via the LMS). A wide range of resources such as the text books, electronic library and the World Wide Web are at the students' disposal throughout the duration of the examination.

The construction of the OBOW exam at U21Global follows a six-step process (Williams, 2004). The first step is to generate some preliminary ideas for the examination. Rich sources of ideas include local newspaper, current affairs publications or professional journals. Compared to text books and academic papers in general, news items or articles written for the general reader have the capacity to engage the student more readily. Since interesting ideas usually take time to incubate, it is wise to maintain vigilance in amassing relevant materials and shaping the theme rather than hastily developing the questions just before the examination time.

The second step involves creating a context which holds a story in a non-academic manner. The context could be situated in a government department, a company, or one that faces an individual. As the subject matter expert, the author of an OBOW exam has the capacity to read a newspaper article or watch a television news report through the lens of their academic discipline. In constructing an authentic assessment item such as this, the objective is to create an opportunity for students to tackle an issue quite differently than if they had not had the benefit of formal learning in the discipline in question.

The third is to enrich the story with various media such as photographs, audio clips and streaming video that add a human dimension to the task and effectively bring the case to life (Herrington & Herrington 1998). Hyperlinks to company web sites and news portals can also be provided to attest to the genuineness of the case. The text and media are selected on the basis of their relevance in describing a situation that currently confronts the central character in the case.

The fourth step is to define the assessment task. Presenting students with the task in context and then setting them up as key decision maker, the expert advisor, or the auditor is an effective mechanism for validating their learning. It is important to note that assessment tasks are crafted in conjunction with the stated learning outcomes for the subject. The purpose of the assessment tasks is therefore to afford students maximum opportunity to demonstrate that they have achieved these learning outcomes.

The fifth step is to provide a task guide that offers some broad plan as to how the students might approach the task without being overly prescriptive. The objective here is to maintain students' focus on the tackling the assessment task in a way that is aligned to the learning outcomes.

The sixth and final step in the process is essentially administrative, but quite critical in terms of the overall design of the examination instrument. There are statements about the importance of critical analysis and the rejection of exam scripts for late submission, but also advice specifically designed to combat plagiarism and cheating. In particular, that it is a *requirement* that students to draw on the concepts and analytical tools referred to in the U21Global subject they have studied and that they demonstrate this through direct reference to course materials. This condition, together with the fact the assessment task is heavily contextualised, make it extremely difficult for students to cheat.

Table 2 summarises the six steps in the construction of an OBOW examination.

Table 2: Process in constructing an OBOW exam

Step	Process	Description
1	Generate the idea	Generate the idea from a variety of sources such as newspaper, current affairs publications or professional journals.
2	Set the context	Set the context of the case in a government department, a company, or one facing an individual.
3	Enrich the story	Bring together various media such as photographs, audio clips and streaming video to enrich the story.
4	Define the task	Place students in the role of an expert witness and define the assessment task in conjunction with the stated learning outcomes for the subject.
5	Provide a guide	Offer broad guidelines on how the task could be approached.
6	Issue administrative instructions	Specify the necessary administrative instructions to maintain rigour and integrity in the examination system.

### An example OBOW exam

An example of an OBOW exam used in the subject ‘IT Systems for Business’, an introductory course in IT, is given in the Appendix. It is quite unique and will not be used again for examination purposes. The length of an OBOW exam paper is deliberately kept relatively short and succinct, and typically, the exam comprises three components; namely, ‘The Context’, ‘The Task’ and the ‘Guide to the Task’. The Context introduces the case and provides some background information. The Task specifies what students are required to do while the Guide to the Task outlines the approaches students may take in response to The Task. Table 3 summarises the main components of the OBOW exam.

Table 3: The components of an OBOW exam

	Description	Concise example
The Context	Describes a real-world problem	“Company XYZ wants to improve the efficiency of its logistics operation...”
The Task	Describes the role the student is playing and what needs to be done	“You are a consultant in a major consulting firm who has been asked to develop recommendations...”
Guide to the Task	Provides suggestions about how the student might go about addressing the problem without being overly prescriptive	“Your colleagues suggest that you examine the logistic processes used at Company XYZ...”

Although the template for the OBOW exam (The Context, The Task and the Guide to the Task) remains unchanged, the content within this template is deliberately quite varied and unstructured. The reason for this, quite simply, is that in the real world, information about a business problem is rarely straightforward and neatly structured. Thus the content provided in The Context section of an OBOW exam is incomplete and loose, so as to simulate a real-world setting. Similarly, in the Guide to the Task, it is important to avoid being too prescriptive as to how the student might go about solving the problem. The idea here is to provide no more information than a consultant would ordinarily receive in a brief from a prospective client. The onus is on the students to manage the fuzziness, make realistic assumptions where needed, interpret the core issues in a problem, and piece together a convincing and cogent solution to the problem.

According to Wiggins (1990), for assessment to be authentic it will display the following characteristics:

- i. The assessment is realistic and reflects the way the information or skills would be used in the real world;
- ii. The assessment requires judgment and innovation and is based on solving unstructured problems that could easily have more than one right answer and, as such, requires the learner to make an informed choice;

- iii. The assessment asks the student to do the subject; that is, to go through the procedures that are typical to the discipline under study;
- iv. The assessment is done under situations as similar to the contexts in which the related skills are performed as possible;
- v. The assessment requires the student to demonstrate a wide range of skills that are related to the complex problem, including some that involve judgment; and
- vi. The assessment allows for feedback, practice, and second chances to solve the problem being addressed.

The OBOW examination instrument would appear to exhibit the first five of these characteristics, the summative nature of the final examination precluding any ‘second chances’. However, students are quite at liberty to seek feedback on their performance from their professors, and while there might not be an opportunity to ‘practice’ solving a similar problem within the confines of the subject they have just completed, the knowledge acquired – specifically the generic skills of sound critical analysis and synthesis – are transferable to other subjects and, indeed, in the course of their professional lives.

### **Evaluating the effectiveness of OBOW exams**

Researching the effectiveness of the OBOW exam instrument, is a complex task, and a definitive analysis is still some way off. To date, a major source of quantitative data has been the surveys (mandatory for all students completing a subject) collected from students at the end of every class. Other sources of data include the qualitative feedback obtained from the full-time faculty at U21Global who are largely responsible for the implementation of the OBOW exam approach at U21Global, and the adjunct faculty who supervise the online classes and author the OBOW exam papers. A synthesis of this research data is presented below, together with preliminary analysis of the findings to date. Such a research strategy can be justified for an exploratory investigation aimed at evaluating the general utility of the OBOW approach. A major longitudinal study is currently in process that compares learning outcomes from the OBOW instrument with those derived from more traditional examination instruments.

## **Preliminary Findings and Lessons Learnt**

### **Student approval**

In late 2004, a survey of students completing both the original and OBOW formats of examination showed the student body to be extremely happy with the OBOW model. Questions focused on the relative depth of learning, real world relevance, the consistency of the examinations with the pedagogy, the time allowed for the examinations, the opportunities for plagiarism and cheating, and overall preferences regarding examination format. The questionnaires were submitted voluntarily and there was a response rate of 45% from a population of 120. The most significant statistic was that *all* students either agreed (27%) or strongly agreed (73%) that, overall, OBOW examinations were preferable to a closed book, invigilated examination format. Other similarly resounding results were that 96% either agreed or strongly agreed that a 24 hour period for the OBOW examination was about right; 98% either agreed or strongly agreed that it was more convenient; and a similar proportion believed the format to have greater relevance to their business education. From an educational perspective, 96% either agreed or strongly agreed that the OBOW examination format was more closely aligned with the U21Global pedagogy than the closed book, invigilated format; 88% either agreed or strongly agreed that, by comparison, it produced higher quality outcomes; 84% either agreed or strongly agreed that the OBOW format was more intellectually challenging; with a similar number finding the interactive nature of the examination more engaging (Williams 2006).

### **Combating plagiarism and cheating**

As an assessment instrument, the OBOW exam is supposed to be completed solely as an individual piece of work. Students are at liberty to discuss various approaches to a problem beforehand in the same way as they would discuss a problem with colleagues in the workplace because this, after all, constitutes learning. The final exam remains, however, an assessment of the individual student’s abilities, and there can be no collaboration in its completion. With a more traditional exam model, ensuring there is no collaboration in a non-proctored or ‘take home’ exam can be

difficult. With the OBOW model, unethical practice is much easier to detect. One advantage of using an authentic assessment approach is that, presented with a very open and unstructured problem, it is unlikely that any two exam candidates will present similar responses. Students may refer to the same broad concepts, but the highly contextualised way in which they are required to articulate and present the concepts makes cheating difficult (Williams 2002). It is impossible, for example, for someone to buy a 'ready-made' essay from one of the numerous online 'paper mills' because in an authentic assessment setting, where the *application* of theory in a real-world context is the quintessential factor, one will never see, for example, the likes of "Define eBusiness. What are key characteristics of a sound eBusiness strategy?" This type of assessment task is quite antithetical to constructivist pedagogy and clearly at odds with a commitment to authentic assessment (Herrington & Standen 2000). To date, where students have presented OBOW exam answers that are very similar, these are easily detected by U21Global professors and the individual students have been called to account.

In OBOW exams, as the example in the Appendix demonstrates, students are encouraged to make use of the course materials, the Web, and other available resources in preparing their answer. This is consistent with the philosophy of authentic assessment, where students would have access to similar resources in a real-world setting. However, making exams open in such a manner brings its own set of problems. Not least of these is the vexed issue of plagiarism.

Plagiarism is a phenomenon that is general to education, of course, but it warrants further attention in relation to authentic assessment. At U21Global, like other institutions, the policy to deal with plagiarism is quite unambiguous in that the inclusion of any external material must be appropriately referenced. Therefore, in the case of a student who has done a 'cut and paste' from a website into their OBOW exam response without attributing the source – something easily detected with the assistance of a search engine like Google or Dogpile – there is little room for debate. However, one has to be mindful of the somewhat of blurred line between plagiarism and what might be considered 'knowledge reuse' where, for example, a student has identified solutions from elsewhere and tailored them to solve the OBOW problem at hand. This case is much 'greyer' than the straightforward cut and paste, and it could be argued that a student has reused knowledge from elsewhere to solve a problem in a new context. This is not inconsistent with an authentic assessment philosophy and, ultimately, it may boil down to the professor's judgement.

When quizzed about the opportunities for plagiarism and cheating in the 2004 survey on OBOW (referred to above), many U21Global students elected to take a neutral stance. When asked the question whether the format of the OBOW exam meant students can cheat, around half disagreed (30%) or strongly disagreed (20%). Meanwhile, 27% remained neutral and 23% agreed (but did not strongly agree) that students can cheat. Interestingly, when asked the question whether the format of a closed book, invigilated exam meant students *cannot* cheat, a broadly similar picture emerges. This time, slightly less remained neutral (20%), with the balance split fairly evenly among those that disagreed (22%) or strongly disagreed (18%) that students cannot cheat in a closed book, invigilated exam, and those that agreed (27%) or strongly agreed (13%).

A point often overlooked is that there is a tendency for people to implicitly assume that the on-campus model is the perfect system. If one were to ask the Registrar on every campus of every university world-wide whether they caught anyone cheating this semester they would, of course, answer in the affirmative. The U21Global position is that, in the absence of a perfect system, it is better to concentrate one's efforts on developing an assessment instrument that caters for the vast majority of students who are motivated by the quality and depth of learning, rather than go for a pedagogically inferior option that may (or may not!) thwart the cheats.

### **A steep learning curve**

U21Global is heavily reliant upon adjunct professors drawn from many business schools from around the world. Many of U21Global's adjunct professors (around one half) experience significant difficulties in writing OBOW exams. This difficulty stems, in part, from an unfamiliarity with an authentic assessment approach and the fact that are used to more traditional methods of exam question setting. A dedicated Authentic Assessment Website has been set up to assist with professional development and some professors are very keen to learn. Unfortunately, however, such a resource tends to be of little benefit in the case of those professors who have been using instructivist forms of assessment their entire academic career, and who are generally very resistant to any form of change. A further difficulty encountered is that writing OBOW exam questions requires professors to have an understanding of real-

world problems in relation to the subjects that they deliver. This can be a testing experience for professors who have had little or no experience of solving real-world problems, either through research or consultancy.

The grading of OBOW exam responses can represent a challenge for the uninitiated. Given their open-ended and unstructured nature, OBOW exams do not lend themselves to any pre-defined 'model answer'. Rather, students may provide a multitude of very different answers, all of which are equally valid responses to the problem presented in the OBOW exam. Like in real-life, one student may propose a solution to a problem, while another may think along different lines to propose a radically different solution. Hence, it is difficult for the professor to develop a detailed marking scheme beforehand, something that might be unsettling for some professors. To further complicate matters, there may be no clearly-defined basis for saying that one solution is superior to the other, and should therefore receive a higher mark. Consistent grading is therefore more difficult to achieve given that solutions may not be meaningfully compared (Svinicki 2005). While U21Global has developed an assessment cover sheet with generic assessment criteria that focus on a student's powers of analysis and synthesis, and an associated grade descriptions document, the professor must still use his or her judgement in evaluating the utility and soundness of a solution and the cogency with which it is being described and presented by the student. As mentioned earlier, if a professor has little experience of solving real-world problems themselves, they may find it difficult to evaluate OBOW exam responses, causing them to take longer complete the job.

While the OBOW exam is a summative piece of assessment, meaning that professors are not normally expected to provide feedback to students, they do have the right to request such feedback from their professors. Although this does not happen too often, it can be a challenge for a professor who is accustomed to having the 'safety blanket' of a model answer or detailed marking scheme that is heavily content-oriented. Instead, the professor must 'get to grips with' the response provided by each and every student, probing the strengths and weaknesses of each answer. The feedback given to a student is therefore of a highly personalised nature which is a positive point, of course, but it may require greater effort on the part of the professor.

### **The transferability of the model**

Since their introduction, OBOW examinations have been used in 130 separate class sections within 30 individual subjects in U21Global's MBA program, across a variety of disciplines, including subjects of a qualitative nature (e.g. organisational behaviour, marketing management, and human resource management) as well as subjects of a largely quantitative nature (e.g. accounting, finance, and data analysis). It can be stated with some degree of confidence, therefore, that the OBOW examination instrument has general applicability in management-type subjects at the graduate level. Experience has shown, however, that some subjects are more naturally amenable to OBOW examinations than others. Devising OBOW examinations for qualitative subjects has, on the whole, been an exercise that most professors have adapted to quite easily. On the other hand, it has been a greater challenge for professors of quantitative subjects. In part, this can be explained by the fact that professors in this domain have become accustomed to setting examinations in a particular way. An authentic and constructivist pedagogy is not as common in these subjects (Fitzsimmons & Williams 2005), so setting an OBOW examination which requires students to demonstrate how they interpret and apply the results of quantitative analysis to solve an unstructured problem can be a 'counter-cultural' experience; these professors typically being used to setting questions that require students to perform a calculation that leads to a 'right' answer. As such, it has been necessary for U21Global full-time faculty to 'coach' such professors to think differently about how they examine quantitative subjects.

### **Summary and conclusions**

The use of OBOW exams has certainly been adjudged a success at U21Global by staff and students alike. The experience has also caused U21Global to rethink certain aspects of the learning design within the MBA and other programs. Some subjects were developed long before OBOW exams were introduced, and were designed without such an examination instrument being considered. One specific area of course revision following the introduction of OBOW exams has been to revisit the learning objectives associated with each subject. Some of the learning objectives were formulated in a descriptive fashion; e.g. "identify and explain the main concepts in IT planning in large organisations". However, OBOW exams, and authentic assessment more generally, is less concerned with recall (declarative knowledge) and more to do with reasoning (procedural knowledge). In the information age, in an



online graduate school of all places, it is appropriate that a lot more energy can now be devoted to what students can accomplish in terms of real-world problem-solving. In an age when information is literally (and metaphorically) at our finger tips, time is better spent making sense of this information rather than trying to memorise it. Thus, many of the descriptive learning objectives have been re-cast prescriptive learning objectives, incorporating higher level cognitive tasks (Bloom 1956); e.g. “develop an IT plan for a large organisation”.

In summary, the authors of this paper believe that the introduction of authentic assessment in the form of OBOW exams has been a positive step from a pedagogical standpoint particularly given the applied business disciplines in the MBA program. Significantly, the OBOW learning design is not something exclusive to online education, and it is clear that campus-based institutions could also implement a similar form of authentic assessment either as formative assessment or, as U21Global has done, in the form of a summative assessment instrument. We would recommend professors introduce one assignment as a formative piece of assessment as a pilot in order to develop a level of comfort with authentic assessment. We do remain concerned about the high proportion of adjunct professors at U21Global who experience difficulties in writing OBOW exam cases, clearly indicating that some form of training or faculty development program is needed particularly to support those who are unfamiliar with authentic assessment.

One of the early reservations when U21Global was deliberating over the introduction of authentic assessment was that it would develop students who could solve problems but not be able to master the ‘basics’ pertaining to a particular domain. So far, there is little evidence to suggest that this is the case at U21Global, particularly as U21Global adopts a pluralist approach to its pedagogy through the use of other assessment instruments such as self-assessment exercises, discussion board assignments and business case analyses. Hence, a broad mix of assessment instruments may be the ideal.

The authors acknowledge that research into the efficacy of the OBOW instrument is still at a relatively formative stage and have noted several avenues for further work. One of these, quite simply, is to gather additional data aimed at answering more specific research questions related to the OBOW examination approach. For example, comparing the feedback on OBOW examinations in qualitative versus quantitative subjects would throw further light on the issue of the transferability of the model. Another interesting question would be to see if there is any correlation between the feedback on OBOW examinations and examination results; i.e. are students more likely to give positive feedback on OBOW examinations if they perform well? Another avenue for research, in conjunction with the first, is to improve the richness of the data collected. To this end, a project is under way to collect qualitative data from both student and faculty focus groups to enable research results to date to be better corroborated. Finally, there is the complex issue of whether OBOW examinations do, in fact, contribute to real-world problem solving skills in the way they have been purposely designed. For this, U21Global is in the process of creating survey instruments for its MBA graduates aimed at establishing whether or not the skills amassed through taking OBOW examinations have proved useful post-graduation.

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## Appendix

### MBA 770 IT Systems for Business Final Examination for Sections MBA650-0501-3 August 2005

#### PLEASE READ THESE INSTRUCTIONS CAREFULLY

This is an open-book, 'open-web', essay-type examination that you can complete at a location of your own choice.

The maximum time period allowed for this exam is 24 hours. Importantly, *you get to pick which 24-hour period you want to utilise over the weekend*. For our purposes 'the weekend' is defined here as the 75-hour period between 12 noon (Singapore time), Friday 19 August 2005, and 3pm (Singapore time), Monday 22 August 2005.

**You must select a 24-hour period that falls WITHIN these 75 hours. No exam submissions will be accepted after 3pm (Singapore time), Monday 17 January 2005.**

When you have completed this assessment item, upload your work via the **Final Exam** option.

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#### THE CONTEXT

FARLEY LASERLAB specialises in the design, manufacture and installation of computer-controlled plate processing machines. The machines employ the most advanced cutting and drilling technologies. For almost 20 years now, the name FARLEY LASERLAB has been synonymous with high performance cutting and drilling systems, and the company has developed a well-established reputation for both innovation and reliability.



Image source: <http://www.farleylaserlab.com.au/>

The competitive advantage of FARLEY LASERLAB specifically lies in its deployment of advanced technologies that provides added-value to clients in a way that competitors find hard to replicate. Clients tend to seek improvements in overall productivity, which is dependent not only on computer-controlled machinery, but also the job scheduling and materials planning systems servicing the client. While many competitors provide a limited selection of these services, FARLEY LASERLAB is the only company in Australia that provides the whole range of

services required by most clients in its industry.

With head-quarters in Melbourne, Australia, the company now employs over 400 people. FARLEY LASERLAB has close to 600 installations across Australia, and has an annual turnover close to AUS\$50 million. FARLEY LASERLAB's strategic performance has so far been sound. Though it is still a small player in global terms, its market share in Australia is over 70%. The company's sales and profits have been growing steadily in recent years. Sales revenue grew at an average 10% per annum in the last 5 years, and average operating profit after tax was also in a healthy upward trend in the last 3 years.

FARLEY LASERLAB's main customers are in the domestic Australian industry. It also supports a few overseas agents for limited exporting. Though it keeps an eye on the world market, it has acted prudently to avoid over commitment.

### **Strategic Business Review**

At a recent strategic business review meeting between Bernard Ragon, CEO of FARLEY LASERLAB and the senior management team, the key issue of offshore markets were discussed.

Like many companies, FARLEY LASERLAB faces critical issues of how to sustain its growth and survive in an increasingly competitive environment. Though the company is currently well positioned, Australia is almost a saturated market. There is no big room left for further expansion. While maintaining the market leader's position in Australia, CEO Bernard Regan recently announced a strategy to expand more actively in offshore markets.



**Bernard Ragon, CEO FARLEY  
LASERLAB**

Image source: <http://www.farleylaserlab.com.au/>

Though FARLEY LASERLAB has a wide range of products covering most of the market segments in Australia, Bernard and the management have determined to penetrate overseas market with its high end products which demonstrate FARLEY LASERLAB's core competency of technological advancement. It plans to adopt a focus-differentiation strategy to avoid direct competition with other industry giants such as ESAB which has a century of history in cutting machines. The focused area is of high technology components that provide new features no other suppliers can provide.

### **IT Architecture**

To support the new offshore markets strategy, Bernard has asked the Chief Technology Officer (CTO) at FARLEY LASERLAB to move forward with the upgrade of the company's current IT/IS infrastructure and architecture which has been overdue for some time. Technology plays a key role in the industry and the rapidly changing nature of information technology often changes the playing field of competition.

At the present, FARLEY LASERLAB has a number of IT systems servicing various functional departments. Most of the systems were implemented many years ago. Though these systems still meet the basis needs of individual business units in a discrete way, the interfaces between the systems has not only been described as obsolete, but even as dangerously inadequate, jeopardising the strategic mission of the company. To support the new strategic mission of the company, FARLEY LASERLAB will need to set up international offices outside of Australia. The issue of systems integration therefore becomes critical. The company is also keen to explore the use of web technology to help penetrate global markets.

A few years ago, FARLEY LASERLAB developed a web-based remote operations, support, diagnosis and maintenance system (ROSDAM), endeavoring to revolutionize customer service support in manufacturing industries. ROSDAM uses the Internet to capture a wide range of information from the end user's machine installation, and feeds this data back into software, design, and service improvements. It then creates process and service databases, and establishes an expert system to help remote users with problem diagnosis and process improvement. However, the full potential of the system was yet to be realised due to FARLEY LASERLAB's limited global market presence.

Bernard is also concerned that with offshore expansion and the establishment of international offices, better ways are needed for sharing information within the company. For example, the senior engineers in the Australian offices need to impart technical know-how and advice to individuals working in offices outside of Australia. Teams would also need to work together comprising of individuals from different offices. He recently heard an online talk given by Marc Eisenstadt, from the Knowledge Media Institute of the Open University in the UK about how knowledge management and online collaboration tools could facilitate information sharing and wondered if such tools would also be useful at FARLEY LASERLAB as part of their IT/IS strategy.

## YOUR TASK

It is in this context that you have been approached by Bernard Regan, CEO of FARLEY LASERLAB, to provide your consultancy services as he is aware that you have recently completed the MBA 770 - IT Systems for Business subject in your U21Global MBA course. Your task is to produce a draft discussion paper on how FARLEY LASERLAB might move forward.

After reflecting upon what you have studied in the IT Systems for Business subject, you have decided, in your paper, to evaluate, critically, the current situation and recommend strategic plan and implementation approaches for IT/IS infrastructure upgrade for FARLEY LASERLAB.

## GUIDE TO THE TASK

To help guide your thinking, you have discussed the matter with your classmates and, amongst other things, they suggest that you contemplate the following:

- Critically analyse the business environment and using strategic tools, such as SISP alignment process, to re-align the company's information systems with its business strategy, and identify specific and critical leverage points where FARLEY LASERLAB can use information technology most effectively to enhance its competitive position.
- Identify major implementation risks and, based on your risk assessment, select the kind of organisational changes which maximises the opportunity of success, and list other organisational factors that can potentially affect the implementation success.

## IMPORTANT INFORMATION REGARDING THE PREPARATION OF YOUR WORK

- 1) In completing this task, be sure to draw on the concepts and analytical tools you have learnt about during MBA 650 eBusiness, making direct references to the subject materials (ie, the prescribed text, courseware and other resources). **Students who fail to comply with this directive will not receive a passing grade.**
- 2) You must upload a written response of 2,000 words (+/- 10%, excluding references) in 24 hours' time via the 'Final Exam' option on the left hand side of your eClasses page. **You are allowed to upload only ONE file.** If you need to upload more than one document, use WinZip to zip up your documents as a single file.
- 3) The piece of writing you submit should be referenced in the normal way, using an internationally recognised referencing system. **Students who fail to comply with this directive will not receive a passing grade.**
- 4) This is a broad question that invites a variety of 'equally correct' answers.
- 5) High marks will be awarded for good, critical analysis, rather than content cut and pasted from websites and other electronic sources.
- 6) The expectation is that you will not have the time to submit an answer of the quality of a term-time assignment. However, you should try, as much as possible, to submit an answer of similar quality.

END OF PAPER