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Managing Social and Intellectual Capital to inform Design and Development of Learning Objects: Issues, Applications, and Technologies

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Profiles: Donald Swanson and Andrew Creed are Lecturers in The Faculty of Business and Law at Deakin University. They have received numerous grants and awards for their work in online education, most recently Deakin’s Vice Chancellor’s Award for Outstanding Achievement in Teaching and Learning for their project, They Practice What We Preach, a multimedia learning object used to highlight the ennobling interchange of academia and industry. This project has given rise to their next endeavor, a series of podcasts called Conversations with Industry.

Abstract

The purpose of this paper is to present and analyse a case example of the development and implementation of a digital learning object in context with academic literature in the field. The paper’s content describes the creation of a multimedia learning object from conception in 2004 to completion in 2006. Provided is the rationale and outcome of a strategically funded University project aimed at illuminating an industrial case study of good management and communication practices for use in classrooms throughout the entire university. This paper is intended to act as a guide for others. Our experience as academics in successful dialogue with educational technologists will inspire and inform those embarking on similar projects, and aspects of it will generalise to development and implementation issues for other kinds of learning objects.

Keywords: organisational performance, human capital, intellectual capital, interpersonal communication, leadership development, management effectiveness
INTRODUCTION

Well before “virtual” was a buzz word, educational institutions were buzzing with “virtual” activities. Most assignments, instrumental and terminal, are and have been effectively virtual in that they are not usually tied to any practical outcomes but exist only to give students experience in manipulating the ideas and theories promulgated in the course of study or to measure growth in facility and understanding of those ideas and theories. Business letters are written but never posted; essays and stories are written but never published; scientific findings are painstakingly recorded but never used to change practice. The fact that some educational tool such as an assignment has been used to create the work means a virtual object is the result, the sustainability of which depends upon the continued application of similar information tools.

Some enlightened teachers will post the students’ business letters, or bind and distribute booklets of student writing or pin student work to a bulletin board; an occasional, exceptional student study may even have an impact on the scientific community, but, for the most part, all these thoughts, fabrications, and findings are tossed out after assessment like yesterday’s news. Students know this, and the perfunctory nature of most student expression is testimony to the “virtual” nature of the assignments. Interestingly, anecdotal evidence indicates that adult returning Commerce students display a much higher level of engagement with their tasks. Perhaps this is a result of a higher awareness of the relationship with and capacity to apply the theoretical aspects of the classroom to the hard realities of work. These adult students have experienced the practice which illuminates the relevance of the classroom’s “virtual” activity (Creed & Swanson 2006).

Not all students can wait until they have had 10 or 20 years of practical, industry experience before beginning a tertiary education. Most move directly from high school to tertiary studies, so it is the art of the teacher to imbue these inherently meaningless assignments and activities with meaning that motivates and directs his or her students. Herrington, Oliver & Reeves (2003) and Bennett, Harper & Hedberg (2001) discuss authentic learning, including how it is part of the flow of experience and can sometimes be problematic to design. Ultimately, we aim to come close to authenticity, to show students who have yet to experience the “practice which illuminates the relevance of the classroom’s “virtual activity.” One project with such an aim is described in this paper. From conception to completion, the whole process of clarifying the idea, gaining the funding, establishing the project, traversing production, and promoting and distributing the final product is outlined.

The project produced a digital learning object at Deakin University in collaboration with Visy Industrial Packaging at Drouin (VIPD) in Victoria. The project supported the evolving development for students of the attributes of a Deakin graduate by displaying management and workers in the
The Background: Forging the Link with Visy Industrial Packaging

The foundations of the project were put in place during an informal meeting. Don Swanson, a Deakin lecturer, and Gavin Krygger, Plant manager of Visy Industrial Packaging at Drouin (VIPD), found themselves sharing a table where Gavin summarised himself as “the happiest manager in Victoria.” Don, alert to an interesting research possibility, encouraged Gavin to expand on his reasons for feeling such happiness as a manager. As Gavin described the way his employees responded his management style, policies and practices, Don realised he was listening to the next evolution of management style. Gavin not only embodied and modelled the personal attributes that Deakin University inspire in their students, but he also created opportunities for his employees to become sophisticated in life skills such as:

- a capacity for lifelong learning
- oral and written communication and presentation;
- a capacity for teamwork and collaboration;
- an ability for critical thinking, analysis and problem solving;
- organisational and personal management skills;
- information technological literacy;

The Krygger-Swanson connection was solidified when Don and Gavin agreed that Don could visit the Drouin plant, interview staff, and develop a paper that described “best practice” in a modern industrial workplace in relation to the theories put forward in Business and Law classes at Deakin University. Andrew Creed, a fellow lecturer and writing partner of Don’s suggested they submit a grant application to Deakin to make a CD that everyone at Deakin could use. The application was successful, so with the assistance of a Strategic Teaching and Learning Grant from Deakin University,
Don and Andrew made a multimedia product displaying VIPD’s journey of transformation which also validated Deakin’s focus on certain life skills as well as academic content. The result is a lively, engaging CD which takes users on a virtual tour of the factory where they discover the inner workings of the plant, “meet” Visy staff, and hear, first hand, personal accounts of the operational and communication practices that have led to the VIPD success.

DIGITAL LEARNING OBJECTS IN HIGHER EDUCATION

Whilst there was little resistance to the idea of digitally recording and presenting the journey (outcomes), some considerable energy had to be expended determining the precise configuration of the learning object, and with good reason. Learning objects function as either a help or hindrance. They must be strategically developed with a particular audience in mind. Best practice requires an ennobling interchange between pedagogical and technical concerns. The technicians had a ready repertoire of storyboard styles but the project leaders had to be sure that the pedagogical foundations were the basis for all design decisions. Corbitt, Holt and Segrave (2004) have referred to ‘product centricism’, an overemphasis on the technological nature of a learning object and not enough on teaching and learning value. Morgan (1997, p.5) reiterates the need to focus on a deeper principle or concern about the person doing the learning. Hayward’s (2001) ‘Cycle of Technology Hype’, represents another warning about the approach teachers might take to creation or usage of a digital learning object. These are the kinds of sentiments that informed the development brief for “They Practice What We Preach.” Strategically, we needed to consider what constitutes quality learning and teaching in universities (Ramsden. 2003, pp.6-7) The challenge was to capitalise on an industry connection in a way that would be meaningful for learners and teachers in a university setting.

Agostinho, Bennett, Lockyer & Harper (2004) point out that learning objects are more or less valuable according to their capacity for “reuse,” or use in multiple settings by multiple people for multiple purposes. This is a concept that should be central for anyone developing a learning object. “They practice what we preach” was designed with reuse in mind, which is evident in the development model in Figure 1. The high level of differing reference group members’ backgrounds and interests as well as the open approach of the project leaders enured a high level of reuse in the learning object.
Figure 1

In education, learning objects are constantly conceptualised whenever a better or more dynamic way of engaging students is required. It is when one embarks on the physical reproduction of a concept into a physical form or learning object that the journey begins, and challenges become evident. As Plato pointed out, forms differ from material objects in that they are transcendent and pure, while material objects are complex conglomerations of properties located in space and time (Hergenhahn, 1992). As shown in Figure 1, the forces most obviously at work in this transformation of form into objects are users, curriculum, institution, available resources, individual philosophy, and organisational philosophy.

Users: It is vital to envision the users, your audience. The end user is obviously the student but the object gets to the student through a number of other users who must be considered in the production process. Such users may be academics with little or no interest in educational technology, other educational designers who are not interested in the content of your object but in its design and application of technology.
Curriculum: Objects can enhance current curriculum or inspire original improvements. Understanding which of these is foremost in your purpose is vital to proper design of learning object features. Curriculum can be a barrier or a vehicle, so a proper review of curriculum and the way in which the object will function within that curriculum is also an important part of object design.

Institution: Policies, procedures and people can either help or hinder learning object design, development and implementation. This is where carefully choosing a reference group, and strategic networking with other key stakeholders, such as design technicians and administrators, can make or break a project.

Available resources: In a large institution, it is not always obvious where available resources exist or are accessible. Creative research, courageous networking, and a willingness to open your project to others will usually uncover an amazing array of human and physical resources.

Individual philosophy: Learning objects are sure to be imbued with the principles, values, goals and preferences of individuals in the immediate project team. Being conscious of these principles creates more consistency in the development and implementation of a learning object.

Organisational philosophy: Embedding the proposal for a learning object within the broader mission and strategic goals of the institution increases the chances of it being supported, promoted, implemented, properly evaluated, and included in future strategic directions.

There are other forces beyond those previously mentioned that also affect the nature of modern education. In “Designing Educational Tasks for Success in Industry” Swanson (2005) points out that, “New forces were emerging that would change the nature of Management and require managers to take on far more complex and sophisticated roles, and, as industry changed, educational institutions had to respond by developing their curricula to prepare students for the challenges of modern management.”

Providing exemplars, stories, or cases, to support learning in tertiary education settings is not new but is also evolving. Traditionally, educators have used cases in the belief that they help learners develop and improve retention and decision making by presenting situations that provide opportunity for students to solve practical problems. Computers have made it possible to translate these cases from their print medium into more animated form further exciting the educational establishment to their use in giving students the experience (tactility) needed for students to establish and internalise the knowledge that is the focus of the study. Cathy Kaufman (2002) asserts that “... nothing has more
dramatically challenged curriculum construction than the accessibility and availability of electronic resources.”

While the challenges of accessibility are not insurmountable, they can often be hard work. Accessibility barriers are often due to students’ lack of familiarity with basic computing skills and investment in resources (Creed, 2004). The hard work then is the work of teaching non content material such as how to use the control panel to activate audio or how to combine Word documents when you want to be teaching your course. This hard work is rewarding as it not only gives students the springboard to higher order learning activities but that it also instils self confidence that translates into the way they approach the learning tasks of the course. It is a constant search for equilibrium that affords access to success in online learning. For optimal online learning experiences the following student/resource/teacher framework should be evident. The student is self-motivated versus dependant. Resources are adequate, recent, and relevant versus inadequate. Teacher is student-centred, flexible, versatile versus pedantic, narrow, and unmotivated. The purpose of this paper is to focus on the resource section of the framework but the other two sections are vital. The educational experience will be only as good as the weakest part of the framework. Bennett and Brennan (1996) reinforce these observations as they show that multi media learning resources have “...the potential to extend more advanced students and to assist those who require more attention through the opportunity to include various levels of complexity in one package.” Latchem, (1993) reinforces this by stating that when a student is "empowered to control their own learning" they are more effective as students. The interplay between the teacher and student over the optimal use of available resources is crucial to a successful experience.

Recent research has given a fresh name to some of the more advanced digital resources, animated pedagogical agents, APAs. Long before APAs enriched content delivery, John Holt (1967) noted, “...that vivid, vital, pleasurable experiences are the easiest to remember...” Adams and Hamm (2000) point out that students, “...can sometimes get closer to understanding with electronic devices than they can with books or discussion This is especially true if electronic imagery is coupled with concrete activities.” Howard Gardener (1999) is even more emphatic about the introduction of APAs into the educational lexicon. He concludes that literacy is being altered by new technologies. This is supported by Holt, Smissen, & Segrave (2006) who discuss the continued emergence of e-learning environments like weblogs, wikis and podcasting. A new generation of learners is developing distinct literacies with such communication tools being at the centre of their experience. Prensky (2001) concurs by recognising this generation of ‘digital natives’ and the differences that must be considered in development and implementation of learning objects.
GENERIC SKILLS AND BROADER TALENTS

Deakin is a large, multi-campus University teaching both on- and off-campus, nationally and internationally. Its three major teaching campuses, Melbourne, Geelong and Warrnambool are located in three different Victorian cities. It is inevitable that this technological amalgam will be used to solve problems created in the daily running of a physically disparate organisation.

As the application for university funding for the project developed, the need for a strategic angle naturally emerged. In the shadow of a pending Australian Universities Quality Agency (AUQA) audit, some discussion with many academics, including the Faculty of Business and Law’s Associate Dean of teaching and learning, began to reveal the importance of what is known as “The Attributes of a Deakin Graduate.” This generic set of skills has been widely promoted as the primary reason of a university education—so that skills can relevantly apply to the life and career of graduates. Having academic knowledge as represented by a degree without complementary life skills is like having a new car with no petrol to run it. The attributes of a Deakin graduate include:

- acquisition of, and ability to work with, a systematic body of knowledge, based on the highest standards of scholarship and research
- understanding of the professional, social, economic and cultural contexts of the discipline area
- understanding of the principles and applications of sustainable development skills
- identifying, gathering, retrieving and working with textual, graphic and numerical information
- communicating orally, and in written form, across a range of contexts
- personal organisation and management
- collaborating and working in teams
- harnessing information and communication technology
- critical analysis, problem solving, and creative thinking attitudes
- commitment to independent and lifelong learning
- awareness of ethics, social responsibility and cultural diversity
- appreciation of international perspectives in a global environment.

Most universities have similar policies that aim to ensure that courses provide educational experiences designed to develop an appropriate level of expert knowledge of a field of study and the attributes, including skills, personal qualities, exit behaviours and generic competencies that will serve graduates in their lives beyond graduation. Many universities pride themselves on the way they that they explicitly develop and assess the attributes of their graduates.
HARMONIZING TECHNOLOGISTS, ACADEMICS, AND INDUSTRY PROFESSIONALS

For this research team luck manifested itself as a combination of opportunity, insight, acquired skills, motivation, and hard work. The project leaders arrived at the genesis of the project with diverse backgrounds in education, industry consulting, instructional design, entrepreneurship, and writing in cross-cultural contexts.

In 2005 the project was funded through the Deputy Vice-Chancellor (Academic)’s Strategic Teaching and Learning Grant Scheme (STALGS). The project was completed in December 2005. The project aims were to create a learning resource that filled an identified gap relating to the development of Deakin Graduate Attributes in the Bachelor of Commerce. This project will provided learning resources that illustrated managers and teams working in an effective, functioning business. (VIPD) It also illustrated how important teamwork is and how teamwork is dependent on good communication and management skills in general. The resource would also contribute to other strategic projects at Deakin University. The metaphor of the “journey” emerged early through the plant manager’s use of it in terms of the transformation of the Visy plant at Drouin and gained symbolic relevance as our own journey as researchers merged with their journey along the path of continuous quality improvement.

The First Project Meeting

The members of first meeting were people who may be needed for successful completion of the project. They were multi media project manager, photographers and sound technicians. They were multi media project manager, photographers and sound technicians. One missing person was the Interactive Media Developer, a person who was crucial to the planning stage and without whom no planning meeting should occur. In the context of a time poor project an early interaction with the media developer could have led to a richer resource near the end.

Creed (2004) highlights the pivotal role of practical andragogues. “The IT people are the ‘critical bearing point’ of the production process, the backbone.” They are part of the feedback loop that can see further down the production track. They know which ideas and designs will work or are problematic. No educator is in the computer laboratory at the point that a digital learning object is created so where there are problems in production, the technician solves the problem and sometimes this changes the nature of the pedagogical design. For example, the original concept for drilling down to key learning activities was scripted but problematic for the designer, who subsequently delivered a prototype that was remarkably different from the original conceptualisation. Luckily this was early in the process and the superior design features were recognised and preferred. Of course, had this occurred in the later stages of production the altered design would have to have been used whether or not it was better. Anecdotal evidence indicates that this unhappy circumstance has occurred with
academics who were not as closely involved with the technician throughout the entire production process.

Once data is gathered, recursive dialogue concerning the production of the piece occurs in fruitful exchanges, clarifying and refining the material. It is essential to develop a relationship of mutual respect where the technician begins to feel ownership of the work. The very elements of teamwork that were studied came into play for the creation of the learning object.

The first meeting clarified certain important points. The researchers needed a clear concept, a wide network of University and Industry contacts. A tight schedule was imposed. Most importantly the meeting of the idealistic academics with the practical technicians created the beginning of a dialogue where researchers stated what they thought they wanted and technicians responded with levels of possibility and alternatives to the original idea that gradually teased out a defined but open plan that further guided decisions concerning the amount and types of data that would be collected. The team was ‘lucky’ to have a talented technician whose talent gave him the confidence to be assertive. As a result, a high level of intelligent exchange occurred over the design of the final product.

The Reference Group

The reference group was most helpful in making sure all aspects of proper research and institutional courtesy were attended to. Of equal or even greater importance, the composition of the reference group was vital to the success of the project. The grant that funded the project was intended to stimulate university wide improvement in teaching and learning. As such, any applications that seemed too narrowly confined to single faculty improvements were rejected. The reference group for the University wide project needed to include as wide a representation as possible. There were representatives from multi faculty academia, the cooperating industry, and various levels of University administration.

Reference groups are an interesting phenomenon. They are needed at the beginning, especially as they give direction and are educative. Academics should select members for their reference group who are long standing academics and members of the university who have an internalised understanding of university policy, practice, history and politics. The educative role of the reference group tends to diminish near the completion of the project and is replaced by a promotional role at the launch of the completed project which helps bring it to fruition in the market. As illustrated in Figure 1., the reference group has dual functions.
The model here implies a long term vision is needed for selecting reference group members who will ultimately help in the marketing and implementation of the product, but this need to be balanced against short term opportunities to gain development knowledge from those same members. The selection of appropriate people to the role of reference group becomes quite critical in this model. In our case some important learning was gleaned from reference group members in relation to ethics application.

The Ethics Application

Originally the project was seen as essentially one of strategic importance as it promotes a cornerstone of Deakin’s educational platform. It was through interaction with the reference group that research possibilities became evident. What was originally envisioned as a project to enhance teaching and learning soon became a more broadly based research project, and reference group members were informative about the possibilities and processes of this. One more salient aspect of the luck involved in this project was VIPD’s willingness to embrace the investigation of their managerial and communication practices and policies. This involved open free-wheeling discussions at all levels of operations. The only proviso was a guarantee that the plant manager would sign off on the final product. Another aspect of the “luck” was that the research team were easily identified as honest, well-meaning, and sincere individuals. From the very first contact, dialogue was candid and spontaneous. This set the tone for the entire project. This capacity for trust and collaboration was evident in every individual we interviewed, and it is testimony to Vicki and Gavin’s management of the Drouin facility.

In this environment, the formal aspects of meeting research ethics protocols supported the research relationship by allowing the people to be open and honest because of the guarantees in the provisions...
of the ethics documents that they signed. The use of permissions documents also lent a formality that indicated to the subjects that this was a serious project of importance. In other words, they felt part of something that was going to be used to help other people enjoy their jobs as much as they enjoy theirs.

**The Instructional Design and Scripting Process**

To this point the researchers knew there was something worth investigating, but it was only through the design and scripting process in conjunction with the educational technologists that the philosophical heart of the study became cognate with the converging forces of VIPD’s willingness to participate and the technological and research capabilities of Deakin University.

In a round table discussion, the research team was repeatedly asked, “What is the way into this journey?” The instructional design was originally conceived by project leaders with vague design notions based on peripheral experiences with other interactive resources requiring the user to explore almost undirected environments. When asked by educational technologists to articulate the way into the journey, the question was not only about the home page and the pathways to the learning resources within, but also a deeper question, “What would someone who is completely unfamiliar with the product and its contents do when confronted with the opening screen and why would they even want to spend time exploring the contents? “ In a written piece the author would be searching for a ‘handle’ or a ‘grabber’ — An opening statement that has the reader wanting to know more. This is where the attributes of a Deakin graduate really began to become important. It began to clarify that the attributes should be the “lens” through which the activities at VIPD are viewed. This was the nexus of the ennobling interchange between industry and academia. VIPD proved what Deakin theorised and Deakin’s theories gave credibility to the daily management of the plant. From this point a more focused scripting process was possible and data gathering began to crystallise.

Detailed planning helped to minimise the need for extensive editing in order to meet project deadlines. It was very important to develop a schedule for management of time and money. The grant forced us to envision such a schedule. The task of developing this schedule was particularly challenging considering all the factors that needed coordination. The technicians required a written brief of every aspect of the expedition. They welcomed such direction as it aligned everyone’s objective and activities. This enabled a smooth passage through the events of the day. Most importantly, with such limited chronological opportunity, no time or energy could be wasted through inefficient or incomplete communication. The subjects had to feel that the project outcomes would validate the effective managerial and communication policies and practices initially discussed. The agreement that the manager had final sign off rights to all material in the learning object lent itself to candid discussion which enriched the final product to a high level of authenticity.
Data Gathering Expedition

Initially the idea was that the team would “drop in” on the factory and interview workers and managers concerning their experiences with VIPD in a relaxed and open manner. However, there was already a functioning problem solving team ready to deliver its findings in a presentation to staff and managers. This event tightened the schedule, as well as clarified all logistics and data gathering that were aligned with the activities of Team 803. Suddenly there were only 2 one day windows of opportunity for getting the all data that was needed. Professional sound technicians, photographers, research times, and teaching duties needed to be coordinated with the workers’ domestic and professional commitments. This all had to align with factory shift times as well as the team 803’s presentation agenda.

Facilitating Adoption of the Resource

A general approach to promotion was planned through such avenues as:

- Quarterly progress reports during production.
- Reference group meeting reports.
- Presentation at the Deakin Conference 2006
- Promotion via DSO, Deakin Portal and the Faculty of Business and Law site.
- Product promoted via Faculty workshops.
- Continuing research publications.

In hindsight, it was difficult to visualise the precise detail of a promotional and implementation plan in the absence of the finished product. Since production, implementation has occurred through the vehicles originally considered but in an evolving form and through linkages that continue to develop and grow. Dissemination occurred in a number of peaks and troughs. It is our experience that those interested in developing learning objects need to foreground dissemination very strongly in even the earliest stages of development. Dissemination is not something that happens at the end, but is embedded in the development and implementation process, as Figure 1 shows. The forces are present at every stage and provide emergent opportunities for dissemination and promotion. Limitations that impact on dissemination can be minimised if dissemination is a highly planned event.

Alexander (2006) provides an overview of key considerations when planning distribution of an innovative learning object. A summary of her recommendations include

- bring in potential adopters as advisers, such as an eclectic reference group.
- present seminars on the innovation
• win awards for teaching and learning
• present subsequent projects at conferences
• publish papers in journals and conferences
• make opportunities for conversations with potential adopters.
• highlight the fact that it would increase the quality of student learning outcomes
• announce the existence of a champion/s of the innovation
• provide a set of tools that make it possible for others to adopt the innovation
• gain the enthusiasm of participating teachers
• display the ease of adaptation to teachers’ own context and values.

It is evident in such recommendations that implementation and dissemination is complex and in many ways difficult to plan in concrete ways. However, to make allowances or contingencies for possibilities that emerge in the above categories is a valuable approach.

REFLECTING ON PROJECT OUTCOMES

The original objective was to create a learning resource that filled an identified gap relating to the development of Deakin Graduate Attributes in the Bachelor of Commerce. While this objective was generally achieved, along the journey it manifested differently from the researchers' original conception. This was not a bad thing. Project leaders at the beginning were uncertain as to the best ways of recording interviews and images of the teams and managers. Approaches ultimately adopted were seen to be satisfactory by all participating parties. Being adaptable was read by other members as openness to what the project would achieve, therefore the skill and talent of all participants became represented in the final product. If rigidity had been applied in direction, content and design, the final product would not have the vitality, authenticity and usefulness that it does. Such elements of an effective product also contribute to the marketing potential of the university just as any new infrastructure like a swimming pool, golf course or media lab have intrinsic marketing value.

The uptake has occurred differently to the way it was first envisioned. The immediacy of the industrial examples is absorbing for users. Cherry-picking of selected multimedia grabs is the preferred mode for lecturers, who can make precise linkages of the clips to points being made about theory. One potential issue is that the resource represents a deep learning tool without the pre-packaged activities and test banks that usually accompany such software. While the research team considers its electronic, open-ended nature as assets of the product, feedback from other academics indicate that this may be a barrier. Such educators tend to be suffering from information overload. This is the current nature of work in the tertiary education sector in Australia. As early as 1983 (pg 2) Frank Smith made an emotional but relevant observation that ignorance ",..., has expanded through an incredible range of...
The intelligence of the world is boggling under the brunt of what is incautiously called "information" that makes it just about impossible to separate the . . . relevant from the rubbish." This has led them to embrace what Smith calls "soft-core ignorance." He says, "It is reflected at all levels of education in the pathetic faith that electronic technology will provide answers to all problems." (Pg 3) This leaves the facilitative educator at the core of a learning experience. The "They practice what we preach" learning object is simply a series of experiences that exemplify an effectively functioning industrial setting. It is up to whoever uses it to create the connections to course content. This can be a daunting proposition for less-facilitative academics, some of whom increasingly see their role as ". . . distributing popcorn as ushers in an electronic circus. (Smith, 1983 pg 8)

At a university level, responsibility to adhere to equity issues, multi-marker comparability, high level of international student needs, workload issues, and time constraints sometimes threaten to consign products like "They practice what we preach" to the level of motivational window dressing when they are ideally utilised as something central to a deep learning experience. If educational considerations predominately drove curriculum, the media clips in the product would be used as windows onto a reality that students must assess as functioning managers would in professional situation. Students appreciate this. Ironically, for a virtual tour, student evaluations of the product have included the statement, "It's nice to see something real." Once academics realise the number of ways the learning object can be used for tasks that are assessed and build assessment tools that respond to the media clips, the barriers of administrative policy will be overcome. This display of the possibilities for enhancing the content of lectures is the core of post production promotion.

There is a strategic imperative to further research and develop this kind of case study, one which ties closely with the attributes of a Deakin graduate. Australian Universities Quality Agency (2005) included a recommendation (no.4) to, "...Communicate to students more effectively the nature and aims of the Deakin Advantage and assist them to document the discipline-specific and generic skills they are developing throughout their course." The Vice Chancellor’s response to this is, “Steps should be taken to communicate to students the Attributes of a Deakin Graduate and to assist them to document the skills they are developing.”

To this end, the resource now stands as a focused example of the attributes at the junction between theory and application. Further development is certainly warranted strategically. Future grant applications are likely to seek to develop and grow the resource, perhaps, through deeper exploration of the VIPD example, or by delving into other case examples.
The increasing trend toward a high level of interchange between industry and academia indicates a promise of growth for projects like this one. Opportunities continue for academics to investigate and document the practices and policies of functioning groups and to use their findings to validate or change the concepts promoted in the lecture theatre. The project presents a snapshot of best practice in the management of a working factory for the benefit of students required to be exposed to public speaking, teamwork, lifelong learning, info tech and critical thinking through their studies. The media clips and design of those clips drives home the importance and reality of these abstractions. The lessons for the future from this experience are:

1. Stay open and interested to the possibilities of people, events and situations
2. Be confident and assertive in applying for grants
3. Keep your design simple. Too much complexity can make the design rather than the information the focus of the project.
4. Select a wide ranging reference group that is multidisciplinary to ensure the project is managed using a collaborative, cross-faculty approach.
5. Be sure that the central participants have a similar vision for the project and enjoy, "differing gifts."

Ultimately, the best “how to” advice we can offer others is to conceive of the stages of development, implementation and evaluation as distinct, each with its own processes and unique constraints. Once clearly identified, natural links between each stage will emerge and the process becomes reflexive rather than linear. In other words, think strategically but act holistically.

FUTURE TRENDS IN THE DEVELOPMENT AND IMPLEMENTATION OF LEARNING OBJECTS

We chose Deakin’s Attributes (a capacity for teamwork, critical thinking, communication skills, intercultural sensitivity, lifelong learning and facility with information technology) as a focus, not only because they are a universal indicator of success for the tertiary education sector, but also because Deakin has policies that value these attitudes and behaviours. The changing interaction and importance of social capital and technical competence in defining a “good” management graduate for the business world of the 21st century is enabled by personal growth in the area of these attributes. Those interested in enhancing student experience should tap into their own university’s cultural and philosophical direction to inform the creation of such virtual experiences. Our experience with They practice what we preach indicates that such projects are personally and professionally rewarding. As the successful grant process and subsequent teaching award for the project show, University administrators increasingly value such activity. As stated, a well designed learning object offers possibilities for enhanced teaching and learning quality, efficiency, accessibility and satisfaction. Our experience also indicates that there are managers who are eager to share their journey of continuous quality improvement and to help others adopt similar strategies for success. There is scope for further
research on learning objects, especially on whether or not cost effective investment is possible and sustainable. It is possible to pour millions of dollars into the technology, but effective learning objects can be handmade by an individual with such common tools as a camera, audio recorder, iPod and a laptop.

Who better to share with than the students who will be the decision makers of tomorrow? As stated by a number of students who responded to a project survey, "It is nice to see something real." This vindicates the framework in Figure 1 and indicates a way forward for those who may be new to digital learning object development and implementation, or old hands who want to reflect on the generic aspects of the process.

CONCLUSION

Digital learning objects are an increasingly effective and accepted tool in the modern classroom. As with any innovation, there will be better or worse renditions of such objects just as there are better or worse textbooks. The best ones will be hand made by a teacher for his or her students and subject. As the innovations progress we look forward to the day when a learning object will have students seated around a table interacting with holograms of people who made a difference to their subject. This vision can only occur if inspired teachers take it upon themselves to devise learning objects in tandem with creative technicians to realize their educational goals. Digital learning objects, with their increasing ease of use and availability, offer the hope of equity and access to rich experiences that provide deep learning opportunities for all students rather than just facilitate delivery of information.
References


Key Terms and Their Definitions

Graduate attributes - qualities, exit behaviours, or life skills that a graduate of a course is likely to possess and need subsequent to the years of study.

Reference group – a group of project advisors. It is recommended to populate the group with people who can strategically assist in educative and promotional roles at various stages of the project.

Exit behaviours – those expressions and actions that graduates of a course exhibit. Ideally such behaviours will match with the stated attributes expected by the university.

Pedagogical – pertaining to pedagogy, or the conscious design of resources and processes that facilitate an educational experience.

Available resources – the items that the budget and network enables the project team to access.

Individual philosophy – The values and ideology that emanate from an individual via their behaviours and expressions.

Organisational philosophy - The values and ideology that emanate from an organisation via their mission, strategy, and tactics.