

A qualitative analysis of issues in developing an online learning project

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Abstract

The drive for externalisation and the development of online learning resources is a major challenge faced by many Australian universities. A particularly demanding undertaking is the development of multipurpose online resources that can be used for different purposes in a variety of contexts. For this to be successful a significant cultural change within universities is indicated. Rather than working in isolation, academic staff will need to share issues, discuss practice, and bring about increasing levels of transparency and accountability.

In this investigation of a specific online learning project, a qualitative research based approach — Soft Systems Methodology — is used to undertake an issues analysis to better understand the capability of the university community to acquire and manage the knowledge required to successfully adopt innovative teaching technologies. The transformation into a learning organisation is a key process of successful knowledge management that this study will seek to identify and understand. Identifying the activity-based issues in adapting organisational culture to ensure that it does not become a barrier to learning and other knowledge management processes is a key outcome of this study.

Keywords

online learning, innovative course delivery, knowledge management, the learning organisation

Introduction

In recent years many Australian universities have invested heavily in ICT (information and telecommunication technology) upgrades, particularly to deliver online learning and student self-service. This is a response to the increased competition for students, reduced operating funds and the changing face of tertiary education. Universities hope that innovative technologies for course delivery will help them diversify their commercial interests, and enhance the variety and degree of online offerings to students. However, this can only be achieved through significant cultural change so that rather than working in isolation, academic staff share resources and discuss practice and so bring about increasing levels of transparency and accountability.

Online learning projects typically exist in complex and poorly structured socio-technological environments, with many different issues, influences and agendas. In particular, the worldview of the learner is a key factor in better understanding how users navigate the teaching and learning interface. Therefore, this study utilises a systems thinking approach that is suited for the qualitative analysis of issues found in complex situations where the worldview and the transformations at the learner interface are important. A particular advantage of the systems thinking approach is that it helps to create a learning organisation based upon the ability to access knowledge to redirect, facilitate and encourage innovative approaches in development projects. Identifying how peoples' worldviews and organisational culture can be managed to ensure that they do not become barrier to learning and other knowledge management processes, together with the identification of project implementation issues, are the key outcomes of this study.

Soft systems thinking

Soft systems thinking seeks to explore the 'messy' problematic situations that arise in human activity. However, rather than reducing the complexity of the 'mess' so that it can be modelled mathematically (hard systems), soft systems strive to learn from the different perceptions that exist in the minds of the different people involved in the situation (Andrews, 2000). This interpretive approach is strongly influenced by Vickers' (1968, pp. 59, 176) description of the importance of appreciative systems in dealing with human complexity. Checkland (1999) and Checkland and Scholes (1990) have attempted to transform these ideas from systems theory into a practical methodology that is called *Soft Systems Methodology* (SSM).

SSM is a systems approach that is used for analysis and problem solving in complex and messy situations. SSM uses ‘systems thinking’ in a cycle of action research, learning and reflection to help understand the various perceptions that exist in the minds of the different people involved in the situation. It is particularly suited to complex management systems, and seeks to evaluate as many different options as possible. This approach is applicable to many domains; including change management, planning for health and medical systems, information systems planning, human resource management, analysis of logistics systems, and expert systems development. More specifically, SSM is being used in research associated with knowledge management and project management.

Checkland’s premise is that systems analysts need to apply their craft to problems of complexity that are not well defined, and that SSM attempts to understand the wicked and fuzzy world of complex organisations. This is achieved with the core paradigm of learning (Checkland, 1999, p. 258). SSM may be used to analyse any problem or situation, but it is most appropriate where the problem ‘cannot be formulated as a search for an efficient means of achieving a defined end; a problem in which ends, goals, purposes are themselves problematic’ (Checkland, 1999, p. 316). SSM, in its idealised form, is described as a logical sequence of seven steps (Checkland, 1999, pp. 162–183). These are illustrated in Figure 1.

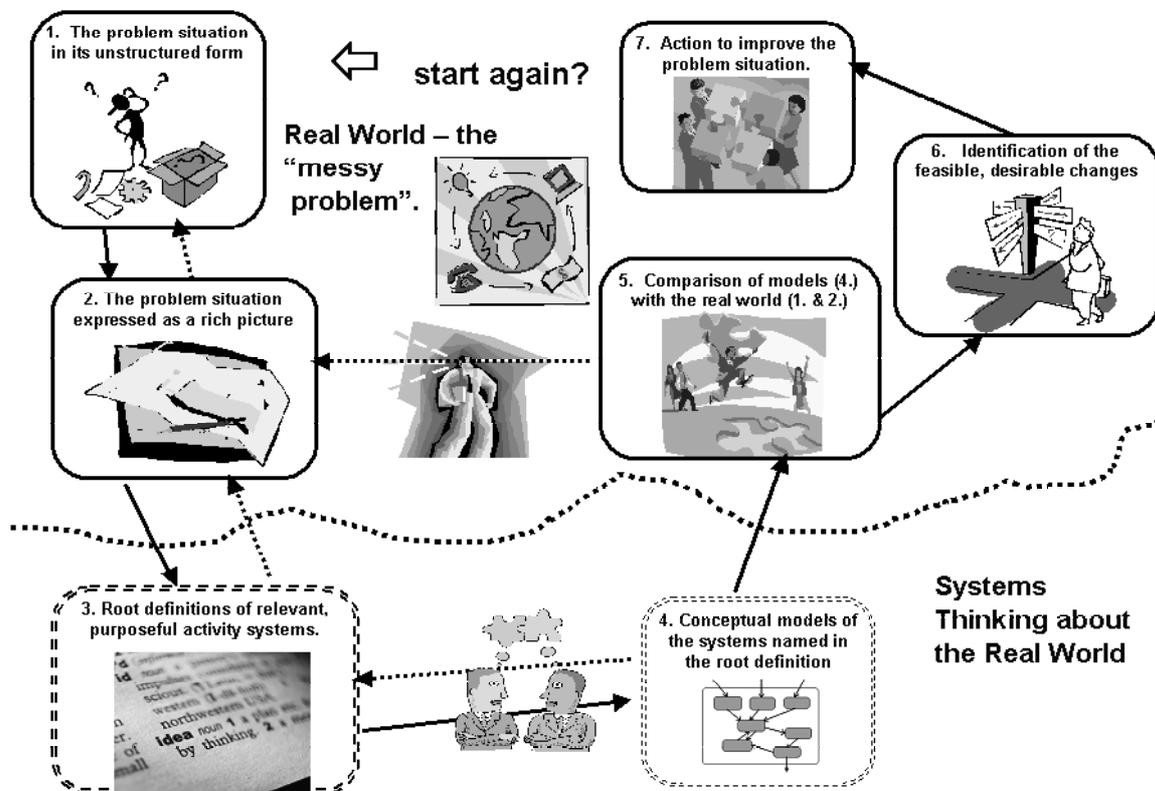


Figure 1: Summary of SSM as a seven-stage process

(Source: Adapted from Checkland, 1999, p. 163; and Checkland & Scholes, 1990, p. 28)

It is most important to note that the sequence is not imposed upon the practitioner; a study can commence at any stage, with iteration and backtracking as essential components. SSM encourages investigators to view organisations from a cultural perspective.

Modelling learning pathways using SSM

This analysis will be conducted following the steps shown in Figure 1. This will be done rigorously for Step 1 through to Step 4, which produces a conceptual model of feasible and desirable activity. The final three steps of the methodology will be incorporated into the discussion that follows (see ‘Analysis of issues’).

Step 1: The problem situation

This step of the analysis is an unstructured narrative about the situation and what makes it problematic.

The narrative begins

In the 1990s, the School of Information Technology (SIT) had shown little interest in flexible delivery as the School had large student numbers and saw little need to develop external units or flexible learning options for students. A first year unit 'Foundations of IT' had been developed for external delivery using print-based materials and while it had been financially successful, it was generally unpopular with teaching staff as no resources were allocated for its upkeep or delivery.

By early 2003, circumstances had changed radically. Nationally a severe downturn in student preferences for IT was occurring (Foresheew, 2004; Thorp, 2003; Hogg 2003) and within the School of IT enrolments had fallen by nearly 50%. Considerable pressure was being exerted by both the Faculty Dean and the University Chancellor to arrest the situation. At the same time a new campus at Alice Springs — 1500 kilometres from Darwin — was opened and the IT degree was identified as a priority for the region. Pressure for more flexible delivery alternatives was also coming from the student cohort as a majority of the students were part time (60%) and/or mature age (average age is 30). In this new environment, developing a degree for external delivery had become a priority.

Recent changes within the University and the School fortuitously resulted in significant organisational support for the project. A recent restructure within the university had seen the School move faculties and in its new faculty IT become a priority area for externalisation. A member of the School was made faculty Associate Dean Teaching and Learning, and was well placed to facilitate access to support staff from the University's central teaching support unit. This central support included the recent adoption of an online learning management system (Blackboard). Within the School, recent staffing changes created a new environment where externalisation was viewed in a positive rather than negative light. The School also received a grant of AUD \$50,000 from the Computer Services Corporation to support the development process.

While familiarity and knowledge of technology may be an inhibiting factor for the uptake of online teaching and learning for staff in many areas of the University, for a School of Information Technology the obvious medium for creating more flexible learning options for students was to create online courses. It was a medium with which staff and students were comfortable and flexible enough to be able to be used in a range of teaching contexts, including face-to-face, distance and CD packages for regional and remote students without Internet access.

Beginning July 2003 three teams of content experts (lecturers), educational designers, graphic designers and web developers were formed to develop units to be offered in Semester 1, 2004. Ongoing discussions about teaching and learning issues led to the development of a shared understanding of curriculum issues and greater integration across the different units. For example the development of the first year units highlighted that academic literacy issues were not sufficiently addressed in the materials and that changes were needed.

The potential to reuse the online resources in other contexts such as industry short courses, VET courses or government educational tenders also became apparent. With the drop in student numbers these alternate sources of funding were becoming increasingly important to the School.

Pleasingly, while the project proved a time-consuming process for teaching staff, all involved were positive about the results and their participation in the project.

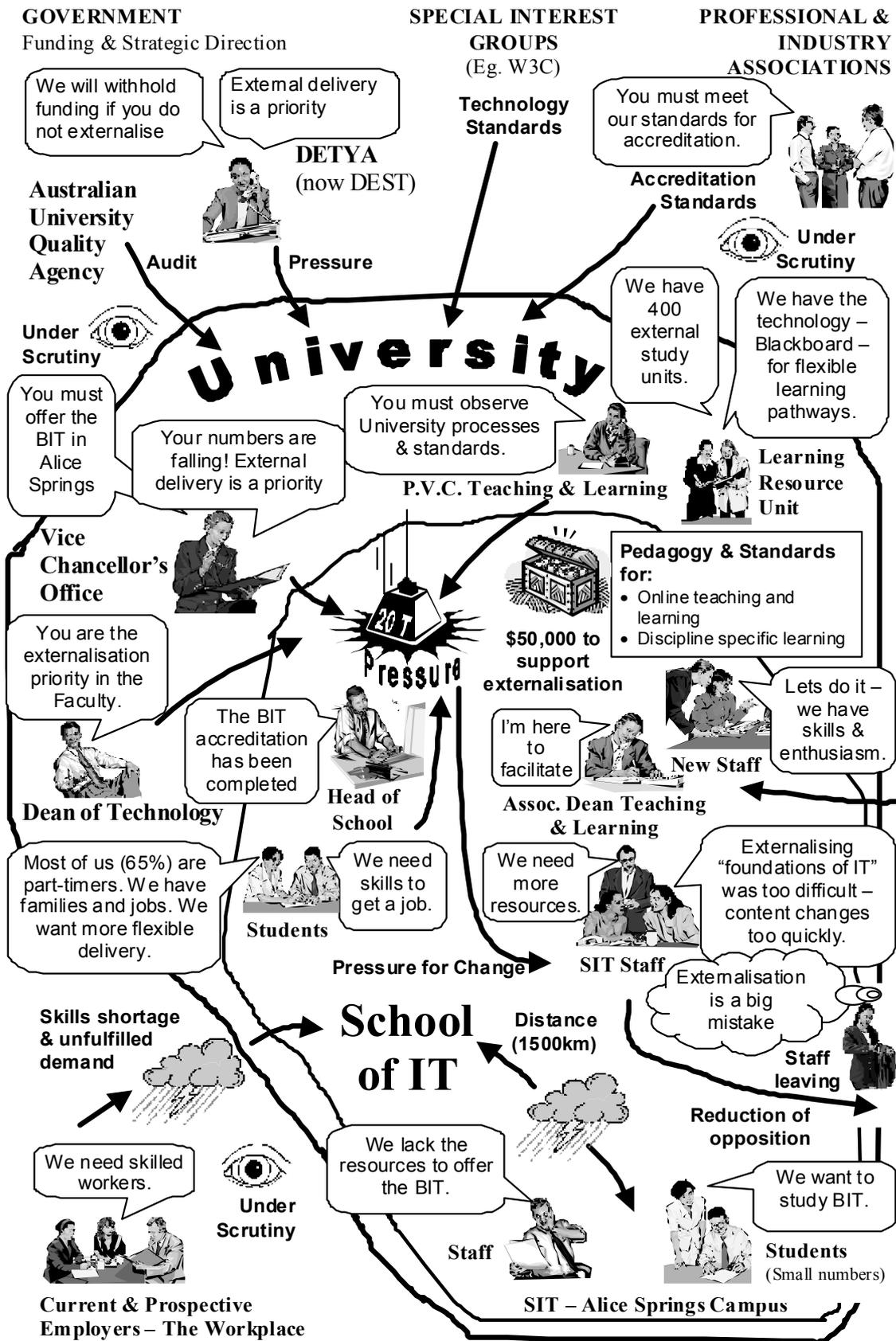
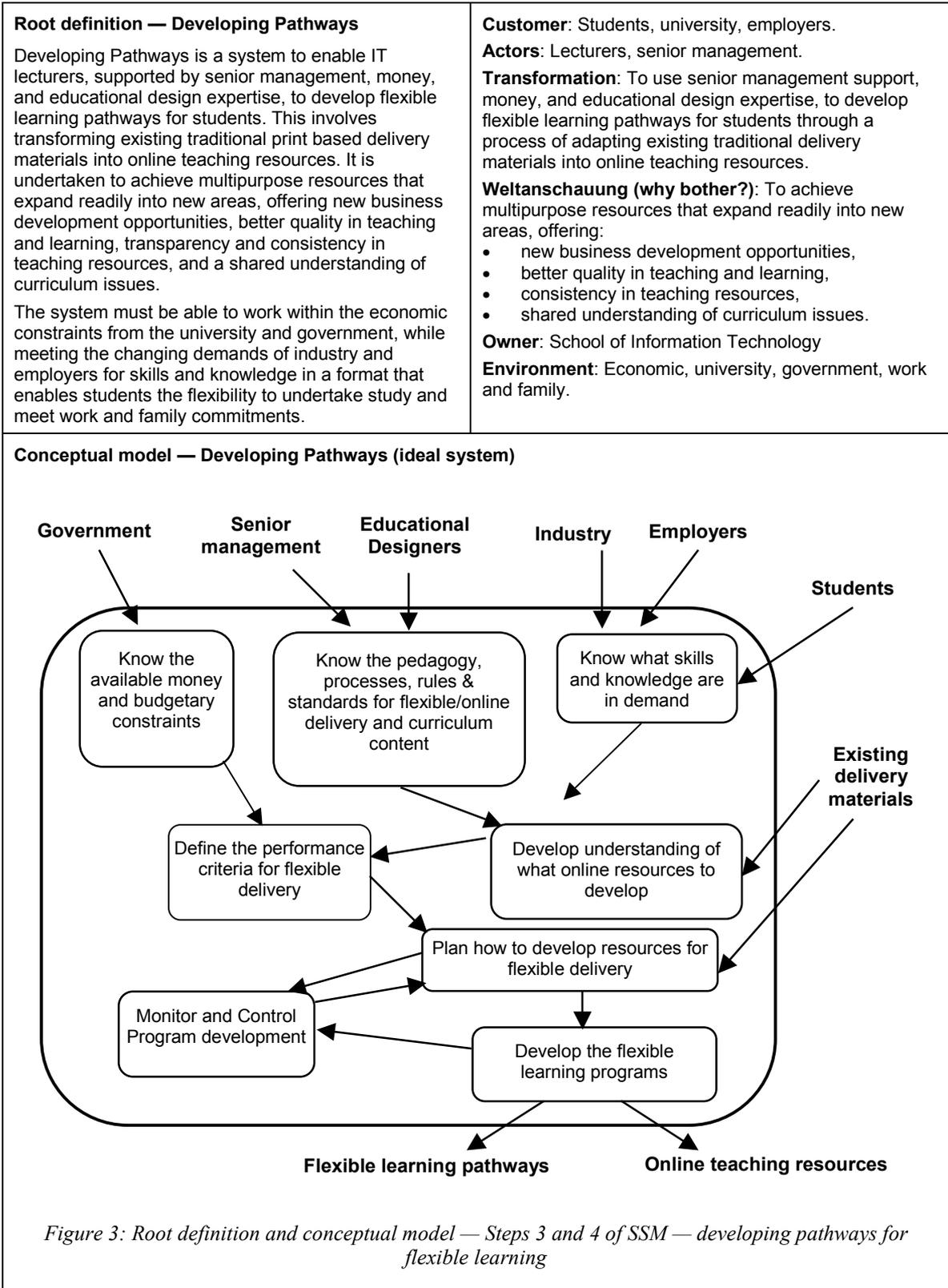


Figure 2: The rich picture — Step 2 of SSM — externalisation and the development of flexible learning pathways



Step 2: The rich picture

A key goal of this stage is to achieve a structured representation of the problematic situation in as neutral a way as possible. This is achieved by building a *rich picture*. This is a pictorial representation of the structures, processes, situation, relationships and issues. It is not, however, a system diagram!

Figure 2 is a rich picture of externalisation and the development of flexible learning pathways. It aims to show the elements of a slow-to-change structure, and the elements of a constantly changing process within the situation described in the above narrative.

Steps 3 and 4: The root definition and model

This step seeks to define an appropriate system to improve the situation in a way that is desirable and feasible: the *root definition*. The mnemonic CATWOE is used to check that all the components are in this definition.

- C Clients, customers (or victims) of the system.
- A Actors who carry out activity in the system.
- T Transformation — being the conversion of the inputs into a changed form.
- W Weltanschauung (or constraining worldview) that makes this definition meaningful.
- O Owner, the person with the power to start or stop the system.
- E Environment — the world surrounding the system that provides the external constraints.

CATWOE is only a component checklist, and the appropriateness of a root definition can only be evaluated through the dialectic process of examination, debate and argument and modification. Therefore, it is important to examine the conceptual model derived from the root definition. For this reason, Steps 3 and 4 are presented together in this study and are illustrated in Figure 3.

Analysis of issues

The conceptual model illustrated in Figure 3 provides a set of activities that can be used to learn more about the situation, and in this case study it provides a framework for undertaking an issues analysis.

Activity 1: Know the available money and budgetary constraints

This first activity is critical, as the high costs in time and money for online development appear as a recurring theme in the literature (Benyon, Stone, & Woodroffe, 1997; Crown, 1999; Luca, Wilson, & Sinclair, 1999; Misanchuk, Schwier, & Boling, 2000; Morville & Rosenfeld, 2002). Underestimating the cost and time of online developments is another common lament (Misanchuk et al., 2000). To ensure sufficient resources are available, executive support can be critical and so generally projects will need to align to the strategic directions of their organisations. Online developments without this executive support can easily founder and produce poorly conceived online materials as pressure mounts with passing time and increasing expense.

Activity 2: Know the pedagogy, processes, rules and standards for flexible/online delivery

This activity stresses the importance of ensuring a sound pedagogical basis for all courses as teaching involves much more than just the transmission of knowledge. The delivery mode should not and does not define the instructional approach (de Verneil & Berge, 2000).

As well as having a sound pedagogical basis, any online course development will need to conform to the processes and rules of the local context. For example, in the case study, there had been a university wide implementation of an online learning management system (in this case, Blackboard) to provide more flexible pathways for students and this system provided the online interface for the units. The university accreditation processes and rules also strongly influenced the timing and packaging of the content into individual units.

Activity 3: Know what skills and knowledge are in demand

This last knowledge activity matches the course outcomes with the market demands of the different stakeholders (e.g. students, industry and professional bodies) and is often a considerable challenge. For example, the ICT job market has in the last decade undergone continuous change both in the skills required and the level of demand for these skills (DEWR, 2002; 2004). ICT skills are also desirable for all graduates and not just IT graduates, with only 5 per cent of the small to medium enterprises (SME) having employees 'solely dedicated' to working on ICT (DCITA, 2004). In this type of environment, students need not only job specific or technical skills, but also more general generic skills such as communication, initiative, planning, team building and lifelong learning skills (DEWR, 2004).

In the case study, a further tension was between the industry's demand for 'job ready' graduates competent in a particular technology against the School's responsibility to produce graduates able to adapt to the emerging and constantly changing requirements of the field.

Activity 4: Develop understanding of what online resources to develop

In this activity existing delivery materials are identified and the needs of the student population assessed. The affordances of each media need to be identified and used to their advantage (Gibson, 1977). This is not to imply that the media and technologies themselves have unique instructional effects but some educational objectives, are more easily achieved using some technologies than others (Reeves 1998; 1999). In the case study the print environment was used for long readings and the online environment for interactivity and communication. The potential for interactivity is a major benefit offered by the online environment, but successfully designing for it is one of the major challenges faced by designers of online learning resources (Sims, 1999).

Schelin and Smarte (2002) warn that developers must assess the needs of the student population and clearly target skills and knowledge gaps before developing online courses. As a number of projects (e.g. Cooper, 2000; Gibson, 1997; MacKinlay, 1999; Warner & Christie, 1999) can testify mismatches in computer skills between course requirements and students can totally overwhelm any learning. Similarly, while rich media content can substantially enhance the learning experience, it is essential to ensure that students have sufficient bandwidth and network access if the experience is not going to become both frustrating and expensive.

Developing online resources can also lead to a deeper shared understanding of curriculum issues within an organisation. Lack of academic literacy skills was identified in the case study as a shortcoming. Without the online development, the level of discussion and awareness of the learning activities undertaken in units being taught by others would not be so high. Such interactions readily highlight problems or discrepancies; they also make successful learning activities and teaching approaches visible, which helps lead to improved quality in the teaching and learning.

Activity 5: Define the performance criteria for flexible delivery

With forethought, multipurpose resources can be created that can be used in a variety of areas and formats. One approach is blended learning where face-to-face students use the online resources as well as external students. This approach has been shown to have a number of advantages including providing students with greater flexibility in their study options, improved pedagogy and the potential for significant institutional cost savings (Aycock, Garnham, & Kaleta, 2002; Boyle, Bradley, Chalk, Jones, & Pickard, 2003; Dean, Stahl, Sylwester, & Pear, 2001; Harley, Henke, & Maher, 2004).

Online resources can also offer new business development opportunities. In the case study the resources have been used as the basis for professional upgrade or short courses, and as part of a government tender for educational services.

Activity 6: Plan how to develop resources for flexible delivery

To develop an educational web site a range of expertise is needed including content expertise, instructional design, graphical and technical skills (Veen, 2001). All of these skills are essential and need to be coordinated and managed if the potential of online learning is to be realised.

Online learning has the potential to bring together the best teachers, with the best learning plans and enthusiasm for learning, to the students who want it, anywhere in the world (Galagan, 2001). This is particularly attractive to organisations who desire flexibility in the delivery of teaching programs (Zurawski, 2000). This aspect was apparent in the case study. While it proved a time-consuming process for teaching staff, all involved were positive about the results and their participation in the project. By necessity, throughout the project significant discussions on teaching and learning and pedagogical approaches occurred. To the surprise of some, those involved enjoyed discussing their practice and found affirmation and renewed professional enthusiasm in the process of rising to the flexible teaching and learning challenge.

Activity 7: Develop the flexible learning units

This is the activity that delivers the outcome: provision of a degree program that meets current and future students' needs. This is the operational core upon which all the other activities focus and provide inputs. This activity is a system in its own right, and can be modelled in greater detail.

Activity 8: Monitor and control program development

This final activity provides the monitoring and control loop that observes the performance of the system, and provides feedback to control via the criteria setting activity as necessary. This is consistent with the need identified by Herberger (2001) to define and redefine the educational product outcome of an online learning system.

Conclusion

This study has utilised a systems thinking approach that is ideally suited for the qualitative analysis of the complex issues and perspectives of the stakeholders associated with an online learning project. It has shown how peoples' worldviews and organisational culture be better understood as an aid to organisational learning. Using this approach a number of implementation and broader outcomes were identified.

Specific implementation issues identified include:

- *Alignment to organisational strategic directions*: projects will need to align to the strategic directions of the organisation, and to the aims and goals of the project team as top-down commitment from management with strong support from the project team.
- *Understand market demand*: courses outcomes need to match the market demands of the different stakeholders (e.g. students, industry and professional bodies).
- *Sound pedagogy*: online course development must have a sound pedagogical basis that recognises the affordances of various media and technologies as well as conforming to the processes and rules within the local context.
- *Coordinate resource management*: a successful project must manage and coordinate content expertise, instructional; design, and graphical and technical skills. This, of course, assumes that there is sufficient time and money budgeted for the development.

The broader benefits that emerged from this study were:

- The development of multipurpose resources that expand readily into new areas offer new business development opportunities and economic savings. Resources used for one context (e.g. external) can be readily adapted to other contexts (e.g. blended learning) and purposes (e.g. short courses, government tenders).
- Participation in developing the online resources has encouraged a deeper level of understanding and discussion of teaching and learning issues. Shared understandings of the curriculum, consistency in teaching resources and improved quality in teaching and learning are possible consequences.
- A cultural change within the organization, as academics actively engaged in sharing ideas and practice with one rather than working in isolation from each other. If this openness transfers to other projects and dealings it has the potential to be the greatest benefit of the project.

In conclusion, this model also helps to identify where further investigation is needed. This is to model and better understand the 'operational core' that delivers the outcome; the provision of a degree program that meets current and future student needs.

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