LEARNONLINE: A CASE STUDY OF TECHNOLOGY ENABLED INTEGRATED LEARNING ENVIRONMENT

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Abstract

The contemporary learning environment encourages students to take control of and manage their learning independent of time and space. As a result various tools, techniques, and strategies are being developed by educational institutions to facilitate students with their learning. At the same time, it is forcing teachers to master various teaching strategies as well as understand and continuously evolve the use of technology to support these strategies. However, the interplay of technology, teaching, and learning is not a straightforward phenomenon. It becomes even more complex when dealing with a diversified range of students with different learning needs. This paper reports a case study of a technology enabled learning environment for information systems course offered at the undergraduate, postgraduate, and professional doctorate level. This learning environment draws upon virtual learning, computer-supported collaborative, personal learning, and E-learning, technologies and enables a fully integrated learning environment. This paper particularly focuses on the impact of this learning environment on pedagogy, andragogy, and heutagogy, and highlights the issues encountered by students.

Keywords: Pedagogy, Andragogy, Heutagogy, Technology.

1 INTRODUCTION

Over the past few years the process of teaching and learning has become technology intensive. In fact technology has enabled a paradigm shift, where traditional teaching is increasingly being replaced with a blended mode. It empowers learners to take control of their own learning, which is why independence of time and space are the core features enabled by this paradigm. Focusing on the lifelong learning needs of public, educational institutions are vying to provide customised and personal solutions to their learning needs. As a result, it is not uncommon to see same core knowledge being packaged together in various different flavours to serve the needs of different audience at different levels of the professional or educational life. At the same time, educational institutions have moved beyond the traditional model of being a public good to a market model, where educational institutions are engaged in fierce competition to capture and sustain market share. This competition is not just limited to attracting on campus students, and has transcended into cyberspace to attract foreign students. As a result, educational institutions in general and universities in particular are transforming the way they operate by using enabling information technologies. They are investing heavily in technology to enable and support teaching and learning on campus as well as in external/online mode. However, the new paradigm has had a mixed response from the stakeholders. Proponents of the new paradigm spruik various advantages, such as on availability of learning resources independent of time and space and self-paced learning. While the opponents or traditionalists are concerned about teaching and learning becoming technology dependent, and the tight coupling of teaching and learning process and resources with technology. Further concerns have been raised by the teachers about the increase in their workload and the demands of the teaching and learning process to be available and connected to...
technology for an extended period of time. At the same time, teachers are required to gain certain level of mastery over related technologies to be able to integrate them with their teaching style. However, technology development is not static and as a result all the entities as well as processes related to teaching and learning are being subjected to continuous change.

There is no doubt that the increased use of technology has brought significant innovations to teaching and learning. It has also raised an important question about the sustainability of innovation. Too much of innovation is bound to affect teachers as well as students in more than one ways. Educational institutions have limited resources and thus are bound to offer standardised technical solutions to the teaching and learning paradigm. However, a one size fit all approach to teach social as well as pure sciences has inherent issues and problems. At the same time, pedagogy, andragogy, and heutagogy have their own technology demands, which, in principle, may not be fulfilled with a standard set of technology support.

This paper presents a case study of an integrated technology enabled learning environment introduced at the University of South Australia. This study is based on the experiences of the students undertaking an information systems course, whose different versions service Bachelors, Masters, and professional Doctorate degrees. This means that different teaching strategies are employed to deliver the course to its various audiences. It starts with a discussion of technology requirements for different teaching strategies, i.e. pedagogy, andragogy, and heutagogy. This next section discusses the existing technology enabled learning environments, followed by the case study. The paper concludes with lessons learnt from the study.

2 CONTEMPORARY TEACHING PARADIGM

Traditionally, education has been seen as a pedagogic relationship between the teacher and the learner through which the teacher determined how the knowledge and skills should be taught (Rosenkranz 2010). Later, a new breed of educational methodology, i.e. andragogy was introduced, which aims to engage learners with the structure of learning experience to improve how teaching could and should be provided (Knowles 1970; Smith 1999). This approach focuses on structured education and the best ways for adults to learn. Nevertheless, it still has connotations of a teacher-learner relationship. Thus another approach took shape, i.e. heutagogy, wherein the learner determines what and how learning should take place.

Pedagogy is a teacher centric and teacher centric strategy, where the teacher develops conceptual knowledge to manage the content of learning activities in the classroom settings. This learning method aims to develop an internal cognitive structure that strengthens learner’s understandings through the learning scaffolding that the teacher provides. This scaffolding leads to gaining knowledge through confluence between learning contents and teacher led experience. Pedagogical strategies assist learner to learn how to learn while developing existing understandings and adopting knowledge from both people and the environment. It is, therefore, low order learning of conceptual knowledge, techniques, procedures, and algorithmic problem solving. Pedagogical strategies are generally applied in teaching of Bachelor’s degree programs. These strategies are particularly intense for first year courses and start to change from second year courses. First year university studies are the time when students go through the transition from high school (totally teacher led learning centric environment) environment to a relative inquiry based intellectually free environment of advanced university courses. This is why technology support for Bachelors level courses move from static technological environment to a dynamic one (Scardamalia and Bereiter 2006). In this period, pedagogy is evolved along with the technology, with teachers’ innovations and students’ accomplishments instrumental in this evolution. The goal of this method is not to evolve a set of activity structures, procedures, or rules, but rather a set of workable principles that could guide pedagogy in a variety of contexts. Therefore, role of technology is passive and aimed at process automation and predominantly enabling flow of communication from teacher to learner. However, as the time progresses and learners find their place in the university environment, their role become more proactive and they engage in inquiry based learning. As a result, the role of technology in enabling the learning environment also evolves to an
active one where it enables, configures, and reconfigures structures and procedures related to the process of teaching and learning.

Since adults are the fastest-growing segment of today’s learning environments, especially in distance and online education, consideration of andragogical principles in designing and delivering courses has become more important (Hubka and Eder 2003; Rosenkranz 2010). Andragogy is aimed at adult learners and engages them with the structure of learning experience (Knowles 1970). In this method, instructors are mainly playing a role of facilitator or resource rather than lecturer or grader whereas learners are operating in a self-directed and autonomous environment. These strategies are employed from the third and fourth year of a Bachelors program to Masters level. Since andragogy is self-directed, instruction has to allow learners to discover things for themselves, providing guidance and help when mistakes are made (Roberts 2007; Knowles et al. 2011; Merriam et al. 2012). This cooperative environment minimizes anxiety and encourages freedom to experiment. Andragogy is based on some assumptions about the design of learning such as adult learners need to know why they need to learn something. Learners approach learning as problem solving methodology rather than content oriented, and they are most interested in gaining knowledge that has immediate relevance to their job or personal life. Therefore, they respond better to internal versus external motivators. In doing so, they take ownership of their learning and experiences (including mistakes), which forms the basis of their learning activities. In andragogical methods, since learning resources and activities allow for different levels/types of experiences, instruction takes into account the wide range of backgrounds of learners. Technology in andragogical settings, therefore, is aimed at enabling an environment that integrates various learning resources at a centralised place. It also allows applications that facilitate information extraction, peer collaboration, and engages teacher and learners in a process of dialogue. Some technologies such as virtual learning environment and e-learning (explained in the following sections) have been used with varying degree of success in andragogical environments.

Heutagogy refers to self-determined learning and brings together some of the pedagogical and andragogical ideas. Heutagogy, aims at developing individual capabilities, thus, may be viewed as a natural progression from earlier educational methodologies (Hase and Kenyon 2000). It is the highest order learning where problems are solved using heuristic problem solving, meta-cognitive knowledge, creativity, and originality (Bhoyrub et al. 2010). The emphasis of heutagogy is on learning how to learn, generative learning as opposed to adaptive learning, action learning, capability development; universal learning opportunities, a non-linear process, and true learner self-direction (Argyris and Schon 1996).

In a university environment, all of the above mentioned teaching approaches are followed. It is, however, extremely cost-intensive and operationally onerous to put in place technical infrastructure exclusive to each of these approaches. Therefore, higher education institutions aim for developing a flexible, however, standardized support technical infrastructure, which could be customized to map the requirements of each of these approaches. The following sections describe some of the commonly used technologies as well as technology enabled environment.

3 TECHNOLOGY ENABLED LEARNING ENVIRONMENTS

The interplay of learning with technology turns out to be complicated as technology changes is a key driver to educational changes (Stahl et al. 2006; Attwell 2007). The extant literature suggests various technologies to support contemporary learning environments. Some of the commonly adopted technologies include virtual learning environment (VLE), computer-supported collaborative learning (CSCL), personal learning environment (PLE), computer-based training (CBT) and E-learning systems.

3.1 Virtual Learning Environment (VLE)

VLE is based on the web and mainly uses web 2.0 tools. VLE platforms commonly allow content management (i.e., creation, storage, access to and use of learning resources), curriculum mapping and planning (such as lesson planning, assessment and personalisation of the learning experience), learner
engagement and administration (i.e., managed access to learner information and resources and tracking of progress and achievement), communication and collaboration (such as emails, notices, chat, wikis, blogs) (Dillenbourg et al. 2002; Davis and Harden 2003; Ellaway and Masters 2008; McBrien et al. 2009; Augar et al. 2012). These systems are considered essential in establishing contemporary distance learning environments; however, they can also be integrated with a physical learning environment (Dillenbourg et al. 2002; Kalay et al. 2004; Dalgarno and Lee 2010). VLE utilises various technologies, such as computer-based learning, web-based training, classroom 2.0, and E-learning 2.0. These technologies enable an environment that helps with transfer of skills and knowledge. These technologies can be self-paced or instructor-led, and thus are useful for pedagogy as well as andragogy and heutagogy approaches.

3.2 Computer-Supported Collaborative Learning (CSCL)

CSCL is one of the most promising innovations to improve teaching and learning with the help of modern information and communication technologies. It uses blogs, wikis, and Google Docs, which allow students and teachers to work collaboratively, discuss ideas, and promote information sharing (Sendall et al. 2008; Crane 2009). CSCL approach, thus, uses technology as the primary means of communication or as a common resource to share and construct the knowledge among participants. These technologies have originated from constructivist, social cognitivist learning, distributed cognition, and problem-based learning theories. These theories focus on concepts like collaborative activity, collaborative learning, knowledge sharing, and building knowledge through interaction with others (Stahl 2002; Resta and Laferriere 2007; Lu et al. 2010).

Learning is a dynamic, on-going, and evolving process which is affected by complex interactions between communities of people (Stahl 2004). Here, knowledge is constructed through social interactions through wikis, mind maps, and other message board systems (Scardamalia and Bereiter 1993; Stahl et al. 2006). The aim of CSCL systems is to encourage discussion among learners (Larusson and Alterman 2009; Asterhan and Schwarz 2010). Social media technologies are at the core of establishment of CSCL environments and because of increasing need of individuals to understand and use those technologies (Resta and Laferriere 2007), these technologies have been adopted in various disciplines. For example tools such as blogs and interactive whiteboards can be used to share work, form ideas, and combine free writings (Larusson and Alterman 2009; Onrubia and Engel 2009).

3.3 Computer Supported Intentional Learning Environment (CSILE)

CSILE is a hypermedia system environment which lets learners to generate nodes (text or graphics), containing an idea or piece of information relevant to the topic under study. Other participants in the learning process could comment upon nodes which result in dialogues between them. Through these collaborations, knowledge is accumulated and learning occurs through knowledge-building communities (Bereiter 2000; Stahl et al. 2006; Zhang et al. 2009). These systems, therefore, aim to support the interplay of private and public reflection through its communal learner generated database and commenting functions. These systems can also be used to facilitate thinking skills such as sharing ideas, and interacting with peers around academic content. In doing so, people could sharpen their thinking and gain new knowledge, which encourages students to formulate their ideas explicitly thereby making them objects of thought (Scardamalia and Bereiter 1994; Gabriel 2005; Zhang et al. 2009).

The theoretical empirical grounding of these systems is relying on theories such as social cognitivist learning, distributed cognition, and problem-based learning theories. According to these theories, many cognitive problems, which cannot be solved individually, can be addressed by combining the limited knowledge and skills of several agents (Hutchins, 1995; Gabriel 2005). Adaptation of these systems in current learning environments usually does not automatically tend to elicit reflective thinking, complex cognition or higher-level inquiry. This takes us to the old reality that technology alone cannot yield results, if it is not adequately backed up with effective procedural and human effort.
3.4 Personal Learning Environment (PLE)

Personal learning environment (PLE) or personal online learning space (POLS) helps learners to take control of and manage their own learning. PLE is based on the idea that learning takes place in different contexts and situations and is not provided by a single learning provider (Attwell 2007; Downes 2010). It includes tools and systems that allow the development and management of eportfolios (Attwell 2007; Sclater 2008; Van Harmele 2008; Modritsch 2010). PLE provides support for learners to set their own learning goals, manage their learning (both content and process), and communicate with others in the process of learning (Cahiti 2010). It represents the integration of a number of web 2.0 technologies like blogs, Wikis, RSS feeds, Twitter, and Facebook around the independent learner. Social software help in widespread adoption of portfolios for learners which brings together learning from different contexts and sources of learning.

4 Research Methodology

This research follows a qualitative interpretive approach with an illustrative case study method. Case study research is an appropriate strategy for answering ‘how’ and ‘why’ questions that investigate a contemporary phenomenon within its real-life context especially when the boundaries between these two concepts are not clearly evident (Yin 2008). The process of this research is governed by the eight step framework proposed by Eisenhardt (1989), which include getting started, selecting cases, crafting instruments and protocols, entering the field, analysing data, shaping hypotheses, enfolding literature, and reaching closure.

This paper, thus, explains the results of an integrated learning environment used for teaching undergraduate, postgraduate, and professional doctorate versions of an information course at the University of South Australia. The core contents of the course remain the same; however, they have been tailored to fulfil the learning and assessment needs of the different levels of courses offerings.

Data was collected through interviews of sixteen students enrolled in these courses. Interviews were transcribed and fed into NVivo software for analyses. It helped researchers to organise data according to different themes emerging from the data collected, which led to within case thematic analysis. These themes relate to the way students viewed technology as an enabler of learning process, as useful tool in gaining knowledge, facilitating collaboration, the issues that they came across, and the way technology is aligned with the teaching approach.

5 Case Study - Learnonline

Learnonline is the University of South Australia's online learning environment, which provides an integrated suite of tools that support teaching and learning. It is built on an open source foundation, i.e. Moodle, and combines various other technologies and resources to enhance teaching and learning. Since it is presented as the standard learning platform for all the coursework degrees; in theory it should, therefore, three major domains of functionality. Firstly, to create a lecturer led learning environment where, teaching staff is able to explain different aspects of subject matter using technology, students are able to download study related information resources, and students are able to initiate communication with teaching staff in a variety of ways. Secondly, to create a student centric learning environment where, teaching staff becomes aware of the individual learning needs of the learners, thereby designing and delivering the subject matter to fulfil those needs. Thirdly, to use the learnonline environment to create different knowledge hubs for different communities of interest so that the participants can create, locate, experiment, share, and grow knowledge around issues or phenomena. The following sections discuss the contribution of the learnonline environment to these three areas of functionality and the issues and challenges posed in its assimilation within the learning culture of the university.
5.1 Core Technologies of Learnonline

Core technologies, resources, and features of learnonline include, course site, including gradebook with ‘Turnitin’ integration; lecture recording system with provision of personal capture; virtual classroom; ePortfolio; iSpring Pro; and course evaluation.

5.1.1 Course Site

Is a Moodle based platform (figure 1), which acts as a central access point for students to access course study materials, including among others, study guide, lecture slides, course schedule, assignment information, course discussion board. It also works as a base for different technologies for lecture recording, assignment marking and management, and students’ interaction to create a unique course site for each offering of a course.

![Figure 1. Course website in a Learnonline Environment](image)

Students enrolled in the course have full access to all the materials till the time they are enrolled in the degree program. This allows them to access course materials at any time in their degree program, to complement their understanding of topics in other courses. An important component of the course website is ‘gradebook’. This section manages assessment submission, extensions, and grading. It is integrated with the university’s system that manages enrolments and results of students. At the end of the course, staff can export the accumulated results and grades directly to this system. Gradebook is also integrated with ‘Turnitin’ and all the text based assignments are automatically passed through this system for similarity. Turnitin is an online tool used to check submitted works for academic integrity. It verifies the originality of any text document against web-based as well as already submitted resources, and generates a similarity report. The similarity report is published to Gradebook and is available to staff and students. Core functionalities of gradebook include, electronic assessment submission, recording of manual submission, downloading submissions, marking submissions, return submissions with feedback, publishing of results, and sending results to university’s results system.
This platform acts as a common space where all lecture notes, suggested readings and discussion threads related to each learning module, and supplementary learning material is available. It, therefore, in theory provides foundation for pedagogical, andragogical, as well as heutagogical approaches. However, these approaches are dependent on enabling technologies that facilitate various aspects of these approaches. To this end, following technologies are used in the learnonline environment.

5.1.2 Lecture Recording System (LRS)

LRS automatically records the lecture and makes it available on the course website. Lecture recording technology being used at the university is Echo 360. LRS are installed in lectures theatres and integrated with the time tabling system. Recordings are, thus, automatically scheduled and published to the learnonline course site. These recordings are available as Flash, M4V video and MP3 audio files. Students can download these files from the course website 10 minutes after the lecture finishes. Course teaching staff, however, has editing rights and can make changes to the recording. In addition, the system incorporates ‘personal capture’, which allows teaching staff to create video and audio presentations. These outputs could be in the form of a narrated power point presentation or demonstrations of experiments, physical modelling, and software operation etc. This allows staff to upload extended commentaries with practical examples on topics and issues not covered during lectures. This helps with teacher led explanation of curriculum, as well as student or problem focused discussion of subject matter or phenomena under study.

5.1.3 Virtual Classroom

It is web conferencing facility that is powered by ‘Adobe Connect’, and helps create a virtual classroom in real time. Virtual classroom utilises audio and video communication, and a range of interactive tools, such as text chat, power point presentations, whiteboard collaboration, application sharing, and file sharing. It is particularly useful for practical demonstrations. This feature is particularly important for externally enrolled students, who cannot attend lectures, and/or are unable to fully comprehend the lecture recordings. This real time interactivity allows students to engage in conversations with teaching staff, which saves time, enhances students’ understanding of subject matter, and allows teaching staff to understand the individual learning needs of students.

5.1.4 ePortfolio

ePortfolio is powered by Mahara, which is an open source software application. It is student owned and student driven online space for expression of their academic, co-curricular, and career experiences. Students can use this space to create a private learning area, where they can complement the learnings and learning logs with audio, video, music, images, and drawings. It provides students with opportunity to keep log of their learning, and at the same time can work as a place to store material that could be used to prepare assignments, presentations, and projects. Generally, students use this space to write blogs on the knowledge that they possess or have gained, their achievements, and their beliefs and idea about certain things, and share them with their peers. This provides students with a forum to demonstrate knowledge, skills and attributes gained within and beyond the classroom. It, thus, helps students understand subject matter, since they can complement their coursework with reflective commentary, see and learn from their peers’ experiences, and share their creative work. However, perhaps the most significant contribution of this platform is ‘breaking of ice’ between students, which helps them to better relate to each other, and cooperate and collaborate on team based work assignments. On a humanistic level, this forum helps bridge up the communication gap between teaching staff and students. Teaching staff are able to understand the educational needs and professional aspirations of the students, thereby enabling them to customise or personalise learning support for individual students.

5.1.5 iSpring Pro

It is a software application that allows teaching staff to create an integrated learning module from a power point presentation. Using this application, teaching staff can add audio commentary, videos (including the ones from youtube), and attach documents such as Microsoft Word and Adobe PDF.
files to complement explanation of important areas. The presentation is published as a Flash file that can then be uploaded to learnonline course site.

5.1.6 Course Evaluation

This consists of two types of evaluations, i.e. course and teaching. The course evaluation section invites the students to evaluate the course teaching, in terms of contents and relevance of the course contents to their existing or intended profession as well as career aspirations. The teaching evaluation section invites students to evaluate the way course was delivered and suggest improvements. It, thus, works as an instrument to ascertain improvements that the audience would like to see in the way the course contents are delivered. In theory, these assessments when coupled with the periodic reorientation/readjustment of course contents provide excellent grounds for making the offerings knowledge intensive, relevant, and are delivered in a manner that students appreciate.

The above sections have explained various aspects of the learnonline environment. In these sections various strengths of the environment have been discussed. This environment was implemented throughout the university in early 2012. There are, therefore, some teething problems as well as some long standing strategic, management, and operational issues and challenges that act as major impediments in realising the benefits offered by the new environment. These issues are discussed in the following sections.

5.2 Issues and Challenges

Environments like learnonline are technology intensive and question the existing status quo. New technologies mean a fundamental shift away from the traditional mode of teaching and learning to a blended mode, where, in theory, technology is used to complement traditional process of teaching. However, unless there is a balance between the number of technologies involved in the process and their maturity, and the processes that they enable, the resulting environment cannot provide envisaged levels of outputs and efficiencies. Learnonline is still in infancy and there are various issues and challenges posed to its complete acceptance, assimilation, and utilisation within students and teaching staff. These issues and challenges have technological, procedural, and human dominions. Some of these issues need immediate action and can be resolved easily through technology and process reengineering, whereas other require a paradigm shift and will take some time.

The fundamental problem with learnonline environment is the there was no training provided to existing students, and there is no formal training/orientation available to new students. Although, help documentation is available on the university’s intranet; students seldom access them. Here, there are two issues embedded in this lack of interest in the new environment. Firstly, students as well as staff are concerned about the increase in their workload in the new environment. Secondly, most of the students are not even aware of the complete features of the new environment. Most of the students use the learnonline platform in reactionary or adaptive mode, where they use it to download information and media files. Students do not engage in uploading information that would be useful for the teaching staff to understand their learning needs. There are many reasons cited for this, including shyness or fear of exposing their lack of knowledge, and not being aware of the presence of functionality. In the instances, where students are aware, there is significant proportion of students who cannot relate them to their studies. A representative comment from a student summarises the situation well, where the student stated that ‘I have to use prior knowledge about student portals and apply it on a ‘trial and error’ basis when using functionality or features that I had previously not been aware about. For example, I didn’t know that requests for extensions could be submitted using the online extension system until I was told by my peers. Some level of on-board help needs to be provided, such as a demo video to get to know the functionality’.

There is a significant divide developing between technology savvy students and those who do not use as much of technology and hence cannot understand its operation easily. Technology savvy students demand more and more features, whereas those at the other end of the continuum struggle with getting the basics right. Where some of the students informed that they use learnonline as a static environment to access study resources, there are others who have explored various technologies available in the environment and are asking for more features. For example, a student argued that ‘groups are a limited
feature in learnonline. It allows students to create groups of users and limit access for group members. This has been used in the past for wikis and group specific communication. However as a user, it is difficult to engage using this feature because there are limited shared abilities. The environment should offer some of the common features that mobile collaborative workers employ. This could include Skype plugins, shared storage repositories with version tracking, or group message boards.

There is no doubt that technology intensive environment has increased the workload of learners as well as teaching staff. It is ironic that something (though in part) that owes its genesis to alleviating capacity constraints is demanding more resources. Teaching staff not has to teach the course but also have to moderate and facilitate various aspects of lernonline environment. While teacher staff is spending a lot of time in preparing learning resources and moderating the environment, students are spending time in learning the technology or setting it up. One of the students stated that, ‘lernonline does not offer the user an ability to create global settings. I want to subscribe to every forum discussion board automatically. Unless the provider defaults to subscribe for students, this is usually set to not subscribe by default. Other global settings may include font size, signatures for forums, or how I want links to open (parent, self, tab). I can create my own landing page with links and customised information, but I cannot have global settings that span my course pages. Every time I use the system I have to do these settings again’. Teaching staff has the same issues, while setting up or maintaining course resources. This being an information systems course, teaching staff do not have too much of a trouble putting up and maintain learning resources and the environment. However, it is likely to be a major issue with social sciences courses or even with courses where the teaching staffs are not well versed with technology. At the same time, the added emphasis on video technology is changing the character of the process of teaching into a performance, where teaching staff not only to have to watch out for what they say but also about how they say it. In these circumstances, the focus of the teaching staff shifts away from what needs to be taught to how it should be taught, which is why there is significant emphasis on complementary readings and aids to make the offerings more wholesome. Due to this, there is information overload on students. There needs to be a balance between technology and the process of teaching and learning. This is where environments like learnonline have the tendency to become too technology centric and thus prove counterproductive.

Learnonline environment development was undertaken by the Learning and Teaching Unit (LTU). However, they did not take into account the requirements of all the stakeholders groups, for example, students and teachers from non-English speaking background; teachers who teach pure sciences (using variety and a lot of technology support during teaching) social sciences (relying on argument rather than demonstrations during the process of teaching); and teachers who have had minimal interaction with learning technology support in traditional mode of learning and teaching. As a result there are gaps in desired functionality as well as mapping of technology on to teaching styles and approaches. Consequently, learnonline and related technologies do not provide a level ground to all teachers and learners and in the due course influences teaching styles and approaches as well as learning styles. There is no doubt that technology enabled environments like learnonline are becoming the norm of the teaching and learning process in higher education institution. However, the way these technologies and technology enabled environments are being developed, the divide between technology savvy students and academics and those who are not technology savvy may seriously impact the quality of the process of teaching and learning.

In terms of technology, there are significant issues related to connectivity, software compatibility and availability, and platform dependence. Although, university has tried to use as much of open source software as possible, still it couldn’t avoid these issues. Furthermore, the open source software utilized is not fully mature and is not compatible with all the technologies. It also needs acknowledgement that a software maybe backward compatible, however chances of it being forward compatible are extremely low. Therefore, as and when new technologies at the learner end are available and utilized, these issues will only increase. However, the most significant issue that arises due to the lack of connectivity and incompatibility is the physical/virtual disconnect between the teaching staff and learners. This would certainly lead to a partial or complete halt of the teaching and learning process. It also highlights that in the learnonline environment, there is tight coupling between the quality of the teaching and learning process and technology malfunction or unavailability.

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6 DISCUSSION

This case study has been conducted among students enrolled in an information system course. The students, therefore, have a strong technical background. In addition, only local Australian students were interviewed for this study, which means that the study lacks the experiences of students with non-English speaking background and non-western culture background. Nevertheless, although varied, the problems and issues identified in the case study relate to institutionalisation of the new environment and will resolve with time. Though this time frame is highly dependent upon how quickly support mechanisms are put in place to facilitate the transition from traditional mode to a blended mode. The decision to move to this new learning environment, however, is dicey and requires lot of attention, first, to deinstitutionalise current organisational technical infrastructure, and then to adopt, assimilate and institutionalise new learning technologies. At the core of this process is as much of emphasize on unlearning as it is on learning to use online learning and teaching services.

In order to address the issues faced by organisations in adopting and utilizing the use of technology enabled learning environment, the authors bring up an interesting discussion which helps organisations to deinstitutionalise their traditional support to teaching and learning structure to institutionalise new technology enabled environment.

6.1 Deinstitutionalising Traditional Support to Teaching and Learning

The foremost step to be taken is to unlearn and deinstitutionalise traditional process of teaching and learning. Therefore, the university has to treat the process of teaching and learning as an institution itself and follow the process of deconstitution of this institution to reconstitute a new technology enabled institution (Păunescu et al. 2012). There is no doubt that moving from a paradigm where technology played a passive role to the one where technology has an active role in changing people's behaviours, is a sea change. It takes decades for the need for change to be endorsed (Greenwood et al. 2002; Dambrin et al. 2007; Clegg and Bailey 2008). The introduction of new learning technologies calls the attention of the university to adopt it and makes appropriate changes to the technical infrastructure as well as practices to bridge up the gap between existing states of affairs to desired ones. Deinstitutionalisation facilitates unlearning in an organisation to learn new facts, realities, and concepts. Through the process of deinstitutionalisation, institutions weaken and disappear because of new beliefs and practices (Dacin et al. 2002; Greenwood et al. 2002; Scott 2001; Seal 2003).

Greenwood et al. (2002) introduce a model for institutional change [Figure 2]. Disequilibrium is the first stage of this model which occurs when events or jolts destabilize established practices. These events could be in the form of social and technological disruptions, competitive discontinuities, or regulatory changes. These changes result in deinstitutionalisation of forms and practices, disturbance of socially constructed norms, introducing new ideas, emergence of new players, domination of existing actors, and institutional entrepreneurship (Stage 2).

![Figure 2. Stages of institutional change (adopted from Greenwood et al. 2002)](image-url)
In the third stage, i.e., preinstitutionalisation, organisations start to innovate independently, and look for technically better and viable solutions to perceived problems. The next stage "theorization" involves both the specification of the failings of existing norms and practices for which a local innovation is a solution or treatment, and the justification of new norms, practices, and technical innovations in terms of moral or pragmatic considerations. These concepts have been neglected conceptually and empirically in the extent literature. If new ideas were more appropriate than existing ones, they would diffuse throughout an organisation or among organisations in a given field; thus, new norms and practices take on a greater degree of legitimacy and, in turn, become institutionalised. This is a journey from theoretical formulation to social movement and institutional imperative which give technological innovations moral and pragmatic legitimacy. When innovations "objectify" or gain social consensus concerning their pragmatic value, they diffuse into organisation, and various organisational actors can observe the institution and its interactions, and thus the new round of socialization starts. The next stage, i.e., full reinstitutionalisation occurs as the result of cognitive legitimacy. This is when ideas are taken-for-granted as a natural and appropriate arrangement and are accepted as the definitive way of organisational behaviour. After technology becomes sedimented and taken-for-granted by actors in a social system, they may even not recognize that their behaviour is partly controlled by the institution (Zucker 1977; Scott 2001; Bjorck 2004; Baptista 2009).

6.2 Institutionalising “learnonline”

Institutionalisation of technology is not a linear process, one that is independent of any organisational, cultural, technical causes and effects (Zilber 2002; Teo et al. 2003; Delmestri 2007). In the normal progression of events, firstly, the technology is implemented, then it is assimilated and once its usage becomes routinized and embedded within the processes of teaching and learning, it leads to successful institutionalisation. However, the term 'successful' is highly debatable, circumstantial, and contextual (Gallivan 2001; Rajagopal 2002; Rai et al. 2009; Maheshwari et al. 2010). The success of institutionalisation cannot be interpreted objectively, so that its definition can applied across the board. The success of institutionalisation is defined by the context within which the technology is operating. In other words, institutionalisation of technology in an organisation is different from the way the same technology has been institutionalised by another organisation. This is because institutionalisation of technology is not an independent process, but it is dependent on cultural, social, economic, organisation, and environmental sub institutions within the organisation (Zucker 1987, Zilber 2002; Teo et al. 2003; Zhu and Kraemer 2005; Lammers and Barbour 2006; Meyer 2008; Kirby and Rosenhead 2010). Therefore, successful institutionalisation of technology can only be interpreted within particular economic, technical, organisational, and cultural circumstances. Nevertheless, the process of assimilating “learnonline” starts from awareness for the need of implementing this technology and moves through preparation, implementation and operation of technology.

Institutional isomorphism is a process in which organisations aim to excel by aligning themselves with the environmental conditions through their social rules, ideals, and practices. These institutional pressures push organisations to adopt shared notions and routines developed within the organisation as well as within the industry they are operate in. In fact, the interpretation of intention to adopt technology and the prevailing context of the organisation is affected by its perception of these pressures. The coercive, mimetic, and normative pressures (Powell and DiMaggio 1991; Scott 2001) from peers, university, students’ learning needs, as well as teaching demands will not only help shapeup technology support for the teaching and learning process, but also help with institutionalisation of the learnonline environment. Institutionalisation will lead to legitimisation and assimilation of this environment with the process of teaching and learning in such a way that its utilisation will be taken for granted as part and parcel of the process. Social structures like learnonline are composed of cultural-cognitive, normative, and regulative elements that, together with resources and associated activities, bring stability and meaning to teaching and learning (Scott 2001). Cultural-cognitive elements are based upon beliefs and taken-for-granted assumptions. Regulative elements involve conformity through sanctions whereas normative elements incorporate traditional morals and informally sanctioned social obligation (figure 3). These elements are not mutually exclusive and are interdependent (Powel and DiMaggio 1991; Scott 2001).
Figure 3. Institutionalisation Mechanism (Adopted and modified from Powel and DiMaggio 1991; Scott 2001)

Higher education institutions are facing growing institutional pressures from their field to incorporate the new legitimated and legitimating criterions. Some examples of these pressures are such as higher education policy change and restructuring, international institutions, governmental budgets, political influence, conformity to requirements regarding the nation-state’s institutional and organisational structure. In order to respond to these pressures, universities are incorporating information and communication technologies (ICTs) in their didactic structure to make their courses socially appealing and economically valuable (Vaira 2004). Moreover, the changing environments have brought higher education institutions under pressure to seek ways to manage their academic employees and students more actively by complying with other institutions (Decramer et al. 2012). These compliance mechanisms lead to institutionalisation of the learning and teaching technologies when the social order becomes stable and repetitive (Păunescu et al. 2012).

The coercive isomorphism occurs by higher education institutions’ desire to conform to laws, rules, and sanctions established by institutional environment. Pressures originating from the state and other powerful organisations are the most direct mechanisms of institutional diffusion based on coercion (DiMaggio and Powell, 1983). Sporn (1999) introduce three main source of coercion in university context, i.e., the influence of legislation, the influence of research partners/funds, and the influence of accreditation and quality agencies. National politics play an important role in organising and shaping the higher education sector according to national culture, economic and social needs (Vaira 2004). Decramer et al. (2012) show how 2008 financial crisis results in significant governments’ budgets constraints, democratization, and decentralization in European higher education and research. Consequently, more demanding about the level and amount of research output pushes these institutions to consider the adoption of new technology enabled learning environments.

According to institutional theory, academic units within universities modify themselves to conform to the institutional norms and expectations of networks of professionals spanning the entire system of higher education. Normative isomorphism concerns the moral and pragmatic aspect of legitimacy by assessing whether the teaching staff and university play their role correctly and in a desirable way to make the learnonline environment work (Zucker 1977; DiMaggio and Powell 1983). The learnonline environment, however, is conceptualized in terms of understandings and expectations of appropriate form and behaviour that are shared by members of university. Such normative understandings constitute the institutional environment of higher education organisations which ensure their legitimacy and, hence, their chances of survival (Lounsbury 2001; Decramer et al. 2012).

The mimetic isomorphism is a cause of students and teaching staff’s tendency to remain similar to their peers in order to get a positive evaluation from the organisational environment (DiMaggio and Powell 1983; Scott 2001; Liang et al. 2007). Higher education institutions, therefore, respond to institutional pressures by benchmarking against each other, copying best practices that promise to
deliver desirable outcomes and responding similar to those previously chosen by other universities (Lounsbury 2001). Decramer et al. (2012) stated that mimetic behaviour in the context of higher education and academic unit will have a positive effect on the adoption of technology enabled learning environment. Privately run higher education institutions are also offering basically the same programs as state run universities, both regarding the curricula and the contents of the courses to assure the formal authorization and accreditation by the state agency (Păunescu et al. 2012). Furthermore, universities are importing and adopting the formal institutional arrangements imposed by State and prevailing in the old-established universities in order to assure the quality (Hâncean 2009).

7 IMPLICATIONS FOR PRACTICE AND THEORY

Educational institutions around the globe are increasingly embracing partial or total learning technologies that enable various forms of active and passive learning environments. In terms of practice, this paper has illustrated the issues and challenges involved for teaching staff, students, as well as the overall institution in moving to the emerging paradigm. It also explains how these technologies should be adopted, assimilated, and routinized so that staff and students take it ‘for granted’ in shaping of the process of teaching and learning, not mere facilitators of the same. Theoretically, this paper asserts that electronic learning systems are an organisational institution in their own right. Organisations adopting these technologies, therefore, need to institutionalise them in their operational environment so that their stakeholders consider them an integral component of the teaching and learning process. Such deportment facilitates their diffusion and assimilation, whereby the various stakeholders establish collective understanding and significance of technology, align the same with their changing requirements, and contribute to continuous evolution of technology. The mutual, however active, interaction of technology and stakeholders helps technology grow, evolve, and mature in sync with the other institutions of the organisation.

8 CONCLUSION

Learnonline is still in infancy and there are various issues and challenges posed to its complete acceptance, assimilation, and utilisation within students and teaching staff. These issues and challenges have technological, procedural, cultural, organisational, and social dominions. This paper reports a case study of a technology enabled learning environment for information systems course offered at the undergraduate, postgraduate, and professional doctorate level. This learning environment draws upon virtual learning, computer-supported collaborative, personal learning, and E-learning, technologies and enables a fully integrated learning environment. The case study reveals that the learnonline system has been imposed on the teaching and learning environment, rather than evolving from the same. The rationale behind this approach is to standardize technology and hope to achieve maturity of processes in due course of time. This approach may work for teacher led pedagogical approaches. However, for andragogical and heutagogical approaches university must focus on the process competencies and evolve a flexible enabling technological infrastructure that fulfils the needs of a variety of students.

The decision to move to a technology enabled learning environment requires lots of efforts and challenges in first, deinstitutionalising traditional learning and teaching infrastructure, and then adopting, assimilating and institutionalising the emerging technology enabled learning environment. This paper concludes that this process is evolutionary and nonlinear and its success depends on a number of organisational, technical, environmental, social, cultural, and other institutional factors and their mutual interactions. Adoption of leaning environments such as “learnonline” is similar to adopting a new technology in an organisation. However, adoption is just one part of assimilation process which cannot make sure that the technology can be full-scale deployed and utilized. At the same time, technology implementation should not be viewed as one off endorsement of technology; instead the organisation should engage in the process of technology assimilation/ institutionalisation to maintain its legitimacy, technical cohesion, and economic fitness on an on-going basis.
As a future research, it is suggested to enter into higher education institutions who may already have adopted technology enabled learning environment such as “learnonline” or are aiming to utilize it to study “How to deinstitutionalise traditional teaching and learning infrastructure to reinstitutionalise technology enabled learning environment?”. Considering institutional pressures (i.e., coercive, normative and mimetic), institutional change and well-defined technology implementation theories, may lead to contributions in both theory and practice in learning and teaching environment.

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