

EXPERIENTIAL E-LEARNING AS A MECHANISM FOR CREATING COMPETENCY IN INFORMATION AND SECURITY SYSTEMS

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ABSTRACT

Business school's must respond to the rapidly changing technology setting if they are to continue to develop professionals who are knowledgeable in the critical area of information technology and business practice. When it comes to developing business professionals competent in leveraging information technology, educators must offer more than just case analyses and familiarization with the technology. They need to offer experience grappling with some of the business critical technologies and issues. This paper demonstrates how real-world technology experience can be brought to the business classroom. Section one develops a framework for experiential learning. Based on this framework, section two highlights the technologies used. Section three demonstrates an experiential e-learning module in information and security showing how it successfully brings the technology experiences to the classroom so that IT professionals genuinely 'learn-by-doing'.

Keywords: Experiential learning, Information systems, security, corporate portals

INTRODUCTION

Business Schools in the 21st Century must be responsive to the rapidly changing technology setting in order to remain competitive (5, 4, 8). This is particularly true if they are to continue to develop professionals who are knowledgeable in the critical area of information technology (IT) and business practice. Many business schools see a need to react to growing technology use in business and want to provide their students with access to these management tools to put them in sync with business practice (7, 11). Unfortunately, the university environment invariably lags behind the marketplace in terms of technology infrastructure (2, 3) creating significant barriers for technology education. Therefore, business professors in technology disciplines usually must think creatively in order to apply the tools available. When it comes to developing business professionals' information technology competency in today's rapidly changing technology environment, educators must offer more than just case analyses and familiarization with the technology. They need to offer experience grappling with some of the business critical technologies and issues.

The question is: How can we bring real-world experience to the business technology classroom? This paper will explore how this has been done in the area of information and security, leveraging a real-world corporate portal/collaboration system implemented at Pepperdine University's Graziadio School of Business. One key value at the Graziadio School is the belief that critical business skills are developed experientially. Section one will explore theoretically how this applies not only to the classroom but life-long learning in the corporate setting, beyond formal training.

Based on this framework, the question remains as to how this can be incorporated into formal education. In order to look at experiential learning in this context, we will explore the use of real-world information technology and how this can be used in the rapidly changing area of information technology. Section two will highlight the system in place and experiential learning opportunities in information technology that arise from using this system.

Finally, in order to demonstrate experiential learning in information technology and outcomes from business professionals, an online teaching module developed for some of the Graziadio School's information systems classes in the MBA programs will be explained. How this incorporates experiential learning will be presented as well as student responses, and ultimately how competency is measured.

Beyond understanding relationships and formal learning, competent IT professionals need experience. Providing experiential learning enables business practitioners to continually build on their skill base because it is a part of not only what they do as professionals, but how they do it.

FRAMEWORK: EXPERIENTIAL LEARNING AND BUSINESS INSTRUCTION

Explicit knowledge can be written down and transferred formally. Tacit knowledge, on the other hand, is knowledge that is embedded in personal experience. Therefore, tacit knowledge is much more difficult than explicit knowledge to transfer and is usually learned personally and informally. Furthermore, tacit knowledge is usually a large part of business operations and critical for success. Surprisingly, this is true even in technical areas such as information systems that often change rapidly.

Nonaka and Takeuchi (1995) provide the most frequently cited description of tacit knowledge and learning. They explain the knowledge creation process in terms of a cycle with four stages: socialization, externalization, combination, and internalization. This model suggests that tacit knowledge is exchanged through repeated iterations of this process resulting in a 'learning spiral' (9). Similarly, there are the notions of 'learning by doing' and 'learning by using' (15). These concepts are fundamentally used in techno-economics to mathematically describe the process of innovation (1,10) but they also apply to actual learning processes. Though these concepts are stylized and theoretical, they can be deliberately taught. That is, experiential learning or tacit knowledge can be part of a formal graduate education by implementing 'learning-by-doing' and 'learning-by-using' in the classroom rather than just studying it. Sherman and Martinoff (2003) apply experiential learning to business ethics. Other studies apply these concepts to strategy and team building (13,14). However, we suggest that experiential learning is not only appropriate for somewhat abstract disciplines, but can and should be applied to technical disciplines as well. Particularly in the growing areas of information technology that require a combination of technical skills, communication, an understanding of management and creative thinking.

LEVERAGING TECHNOLOGY FOR EXPERIENTIAL LEARNING

In order to effectively bring experiential learning to the business classroom, real-world technology has to be used. If systems aren't in place, then it becomes important to arrange access for students and choose carefully the information technology areas that will be covered experientially in the curriculum. The Business School at Pepperdine University recently underwent an extensive implementation of a corporate portal system enabling students to extend experiential learning to the electronic environment.

A corporate portal brings together under a standard web-based interface content, applications and services from incompatible platforms (6). It can serve as a single point of access to:

- Enterprise applications
- Documents and Web pages
- Internet services
- Collaboration Tools

Companies ranging from traditional manufacturing and retail to services and Internet companies are using business portals to create efficiencies both inside their companies and with their suppliers and partners. Portals provide business users with integrated, personalized, and web-based interfaces to business content. Furthermore, this occurs in a single, consolidated customizable view that is secure. A portal is distinct from a web-interface or campus intranet applications such as Campus Pipeline in that it is:

- Customizable by the user
- Searchable
- Provides publishing and categorization services.
- Automates workflows.
- Is a single point of control for securing internal business content plus external/internal business intelligence?
- Provides collaboration and groupware capabilities.
- Includes delivery and notification services.

This system enables students who are working full-time to balance work, education and family. It does not replace the classroom but it does extend the learning environment. Corporations have adopted this technology to achieve greater efficiencies in a mobile, flexible and often travel weary workforce. Just having the tool facilitates practical learning since students use the same tools in business practice. So, using the tool with its basic functionality at least ensures familiarity with specific information technology process and tools that businesses use for communication, collaboration and decision-making. However, the competent professional needs more focused and specific learning outcomes. In order to demonstrate how this can be achieved, the next section will look specifically at experiential learning leveraging this tool, in the area of information and security.

USING A CORPORATE PORTAL E-LEARNING SYSTEM TO TRAIN BUSINESS PRACTITIONERS IN INFORMATION AND SECURITY

In Pepperdine University's MBA Information Resources and Technology class, as well as the Information and Process Systems class, a specific information and security module was developed to address the primary areas of online vulnerability. It was felt that delivering this class online would provide students with first hand exposure to the environment and it would also enable the international students to have a significant voice. Sometimes, during class discussion, the international students are reluctant to speak out, but online they were able to express their insights more comfortably in class dialogue.

Many of the international students indicated that they not only learned more through experiencing this environment and actually having to deal with simulated information and security issues, but also the dialogue was not so US-centric. This module was very successful in all of the classes according to unsolicited feedback on the class evaluation sheets. Many students noted that doing the class online, enabled them to 'iterate' a second time through the material that was difficult and also to re-experience some of the online exercises they had to engage in so they could effectively 'learn-by-doing' how to make better decisions regarding an information and security problem that was encountered.

This module is completely online and replaced one face-to-face class meeting. Essentially, students were required to enter GraziadioNet, the business school's portal and go to their eRoom, where they were to open a folder entitled 'Information and Security Class' (Figure 1). In this folder were complete directions on how the class would work. Students first opened the 'lecture' which included a brief video presentation explaining the class and how it would work as well as a narrated PowerPoint presentation that the students could run at anytime or as many times as they needed (Figure 2). They then watched three different short videos describing information security breaches and events. Afterward, they were required to join in an asynchronous class discussion regarding each event.

The students then had to go online to use some internet resources to better understand their own personal security for their home, school and work environments. They were given specific individual assignments in this regard. They shared their findings in an online discussion. Finally, based on this analytical experience, they were given three different firm-based information-security scenarios and individually they had to work through the areas of weakness and propose how these gaps should be rectified.

In one of these scenarios, they had to perform a security risk assessment of a company taken from real-life experience. They became familiar with and used online sites and organizations such as CERT which offer constantly updated information regarding security issues of relevance. In addition, they had to compare different tools such as firewalls to establish which would be most suitable for the different environments based on the experience they gained in the exercises online.

In a different scenario they had to analyze the security vulnerabilities of their department or their company. Then they were asked to detail the total impact on the organization of the security problems identified for each computing platform. Finally, they had to identify the types of control problems illustrated by each of these vulnerabilities and explain the measures that should be taken to solve them.

The first part of the online exercise which included the PowerPoint followed by discussions was the socialization part of tacit learning (Figure 3). They went through material which they then had to discuss in terms of their own personal and business experience. The second part of the exercise in which they had to watch videos of actual scenarios and then discuss these was the externalization aspect of experiential learning. They were linking the tacit knowledge they gained from each other with the explicit knowledge in the material that they went through. They then had to go through internet resources to find their own personal vulnerabilities at work, home and school. This was the combination part of experiential learning where they combined different explicit ideas with tacit ideas that were personal. In this way they each created unique and individualized knowledge. Finally, they had to internalize this knowledge through the corporate scenarios. In this part of the experiential learning, the students extracted what they had learned from newly created tacit and explicit knowledge and applied it to real situations. This was the actual 'learning-by-doing' phase of the process.

This final phase was where competency was actually measured. These parts of the class were shared with information-security professionals, typically in the student's own company, who ultimately decided whether the work was viable. The acid-test was whether or not the company took these recommendations on-board and looked favorably on the student's work.

CONCLUSION

Experiential learning is a critical component of everyday work in the corporate environment. Therefore, it is important to incorporate this type of learning into formal education. For IT professionals who are constantly learning on the job, exposure to the 'learning-by-doing' skill-base is critical for continued success. The e-learning environment offers a unique space for complementing the face-to-face classroom experience and exposing students to the 'learning-by-doing' and 'learning-by-using' practice. The theoretical structure and e-learning example presented in this research demonstrate that experiential learning can be used for developing capable professionals in the IT area. Information and Security easily lends itself as a topic to this mechanism, but certainly the mechanism and tools can be expanded to other areas of IT as well. By understanding the concept of tacit knowledge and applying the appropriate tools, educators can equip professionals for life-long learning. Furthermore, life-long learning is essential for meeting the continual challenges of keeping up in this rapidly changing field.

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Figure 1. eRoom with a Folder Entitled ‘Online Class September 23’

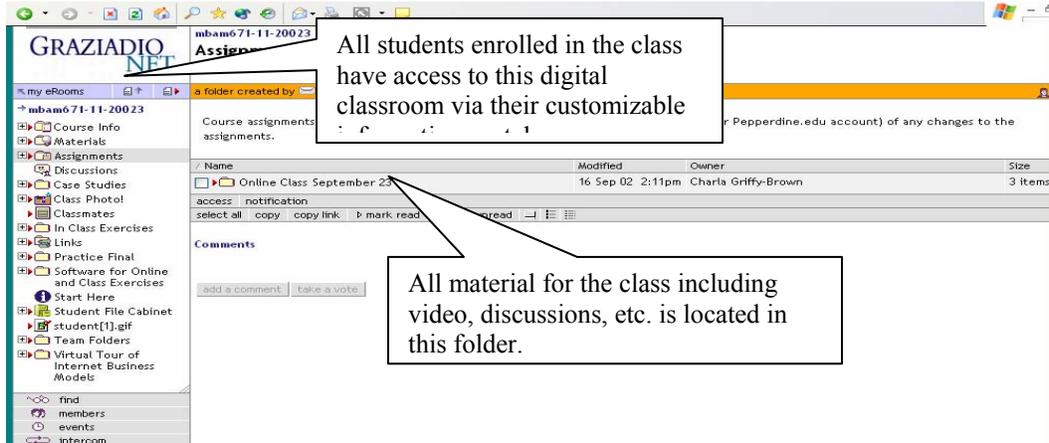


Figure 2. The Information and Security Class

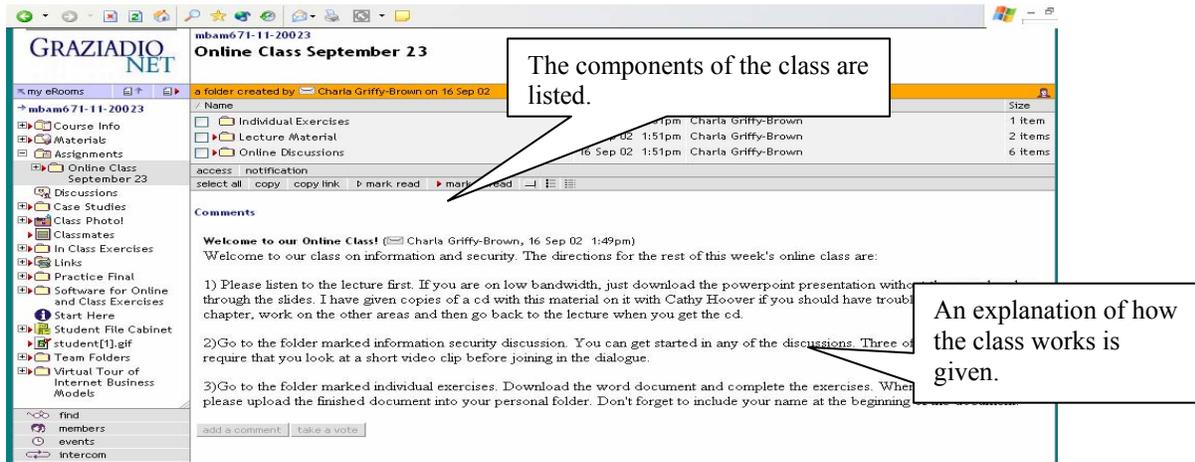


Figure 3. The First Part of the Online Exercise – The Discussion and Socialization Part of Tacit Learning.

