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AMCIS 2010 Proceedings

Americas Conference on Information Systems (AMCIS)

8-2010

Making a Case for Scenario-Based Learning in IS and Executive Education

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ABSTRACT

This paper argues that scenario based learning is an appropriate pedagogical strategy for business school education, both for students and for executive education. Beginning with a discussion of problem based learning, the pedagogical strategy within which scenario based learning is grounded. The approach is explained and two examples of scenarios are offered, one for students and one for executives.

Keywords

Scenario based learning, problem based learning, pedagogy.

INTRODUCTION: PROBLEM BASED LEARNING

Scenario–based learning is based on a pedagogical approach called "problem-based learning" (Duffy and Cunningham, 1997; Savery and Duffy; 1995) and the development of a situated learning environment (Larsen and McInerney, 2000; Cole and Engestrom, 1993; Lave, and Wenger, 1991; Brown, Collins, and Duguid, 1989). This approach assumes that learning is based on a notion of authenticity. Students learn as they work their way through complex and ill-structured problems that are taken from and approximate professional situations in which students will eventually find themselves. Problem based learning is based on an assumption that "authentic real-world problems in a professional context help students to take ownership of the learning experience" (Bentley, Sandy, and Lowry 2002: 107). Ellis et al. (1998) argue that PBL is appropriate for IS education because the research and practitioner paths described above are problem-driven and, in the latter context, life-long learning is becoming an important requirement in many IT careers.

Problem based learning was developed by Barrows in the 1970s (1986) and used at McMaster University School of Medicine. It has become commonplace in medical education (Colliver, 2000; Doig and Werner, 2000; Antepohl and Herzig, 1999; Biley and Smith, 1999; Albritton, Davis, and Karp, 1995; Donner and Bickley, 1993). In a typical implementation, students are divided into small groups each of which is presented with a complex and ill structured problem. To resolve the problem, they engage in critical thinking and research and use analytic skills to determine how to proceed. PBL is a student-centered approach because they (Edens, 2000; 56):

> [T]ake on the active role of problem solvers. A key element is the student's ownership of the problem and the natural way the problem unfolds as students lead an investigation from which subject matter content and instruction emerge.

PBL is an interesting and challenging approach because it reverses the roles of teacher and student by requiring the student to take more control over his or her own education (Barrows, 1986). PBL:

> Is an instructional method that challenges students to 'learn to learn,' working cooperatively in groups to seek solutions to real world problems. These problems are used to engage students' curiosity and initiate learning the subject matter. PBL prepares students to think critically and analytically, and to find and use appropriate learning resources. (Duch, 2000)

In medical education, a typical PBL experience might involve a clinical scenario where students are asked to develop a diagnosis based on a set of presented symptoms (Margetson, 1998). While exploring their problem, they search for and retrieve relevant information that typically takes them across disciplinary boundaries. In periodic meetings with the faculty, students discuss their progress and describe problems they are encountering. They also suggest potential resolutions, in the form of hypotheses or research questions to guide their next steps. Ideally, the knowledge that they seek out and employ in developing resolutions to their problems become anchored in the context of practical problem solving. Over the course of the term, students (Moiao, 2000):

> Often divide up the work … such that a sub-group is responsible for performing a particular activity. Some are carried out in asynchronous sessions. In each session, it is impossible to predict precisely what actions make up the activity, to know in what order they are performed, or to predict who will manipulate which artifact as the next action. When students are collaboratively generating hypotheses, proposing solutions, evaluating the reliability of their findings, or considering the reliability of the hypotheses and solutions, then they will contribute various ideas in an order that cannot be predicted in advance.

Consequently, the faculty role in this process changes. The lecturer is replaced by the guide and facilitator whose primary responsibility is to help student teams move towards reasonable resolutions of their problems. This is a significant shift in role for faculty, who have to realize that instead of dispensing information to students and controlling the classroom, they "contribute to problem-based learning by providing suggestions …[and] do not prescribe or dominate" interactions with their students (Shanley and Kelly, 1994).

PBL has its roots in constructivism (Duffy and Cunningham, 1997) and assumes that people's fundamental interactions with the world are in the form of an ongoing process of sense-making. PBL, therefore, involves interactions with learners to assist them in their ongoing attempts to make sense of the world. It emphasizes the importance of the problem as the focus of learning activity and the context in which the problem is presented. The emphasis on constructing the problem in a context that is relevant to the student and that mirrors, to the extent possible, the student's potential future work environment, means that PBL is a form of "situated learning." Consequently, one main objective of course design is to ensure that students' learning experiences are "embedded in the target context and require the kind of thinking that would be done in real life" (Abdullah 1998; 1).

Educators in disciplines outside of medical education have been experimenting with PBL and "slowly the sciences in general have begun taking it up, and even more slowly, the humanities" (Rheem, 1998). Recently, PBL has been used in information systems, computer science, software design, artificial intelligence, sociology, education, and library and information science (Bentley, Sandy, and Lowry, 2002; Koch & Teege, 1999; Dimitroff, et al., 1998; Maskell, and Grabau, 1998; Brandt, 1997; Duffy & Cunningham, 1997; Coldwell, 1996; Stinson and Milter, 1996; Sernau, 1995). For example, students taking a class in electronic commerce were faced with an ill-structured problem – developing their own digital businesses from initial conceptions to a working ecommerce businesses selling digital goods in a simulated economy to real shoppers (Rosenbaum 2000). The instructor provided guidance, but student teams worked out the entrepreneurship and design and development issues on their own.

SCENARIO BASED LEARNING IS PROBLEM BASED LEARNING

Scenario based learning is a subset of problem based learning, sharing many of the same constructivist assumptions. For example, scenario based learning shares assumptions with PBL about the learners, particularly with respect to situated cognition where the relationship between the learner and the social and material situation takes precedence. Knowledge cannot be understood apart from its contexts of use because it is deeply embedded in these contexts. Learning is a component of authentic activities that are involved in the community of practice in which the learner is enmeshed. Scenario based learning makes use of inductive approaches to problem solving involving learners in cycles of inference and discovery. Scenario based learners are self directed, make use of prior experience as a key resource, and experience learning as problem-oriented and based on social roles. Their learning style is associative, meaning that certain conditions lead to certain outcomes. Meaningful learning is a result of instruction being embedded in situations that are as authentic as possible.

Scenario based learning, based on situated cognition, is a way for learners to place themselves in a situation that provides a context within which they can reflect upon and think through issues that are relevant to their future or existing professional practice. For example, there may be new MBA students who are told they will need to go through a mathematics boot camp to be prepared to understand the complexities of probability, expected value and variance, the equation of a line, and exponents and logarithms. They have to take the boot camp because of their weak quantitative GRE scores, so it is expected that they will struggle a bit. One way that they can learn is through lecture, rote memorization and testing, however, since this is likely to be the type of mathematics education they experienced in college, repeating the experience is not likely to improve the outcome. In contract, scenario based learning takes into account the fact that some of the issues that learners have with the content they must master is that it is not often aren't into a context where it is relevant to them.

To address this issue of providing a relevant context for learning, imagine a scenario that is about a new technology; in this scenario, executives at a high-tech company are deciding whether to launch a product. At the same there is a parallel story of a group of graduate students going through boot camp and not understanding how the math they are learning really will be used. Make one of the graduate students (Christine) related to one of the executives (Mark). Have Mark relay the company's situation to Christine (in the scenario they are related—the executive is a long lost uncle). Then when Christine

sees her fellow students struggling with the mathematical concepts they need to learn, she helps place the these concepts into a meaningful context by having her fellow students reenact the mathematical methods and principles the executives used to inform their decisions. Thus students experience what is likely to be a more authentic situation and can more clearly see the relevance of this type of math to their future; they also can grasp more easily the ways in which the concepts can directly be applied within their social frameworks.

Scenario based learning uses stories that are clearly defined, realistic, and complete with the goal of taking the learners through real-world situations in which the characters' challenges are the learners' challenges. In this way, the learners can be more directly involved in decision-making and problem solving. If the scenarios are designed correctly, they can be very interactive, engaging and dynamic.

How it is done

To make the stories relevant and contextual, scenarios need to engage the learners in the challenges the characters will experience. They have to be written so that they "come alive" for the learners. The best strategy for accomplishing this is to gather a group of subject matter experts (SMEs) for a period of time to do the following:

- Define and refine the learning objectives of the scenario;
- Generate characters to personify learners;
- Craft scenes to reflect the organizational context;
- Leverage available resources to maximize the realism of the scenario;
- Craft instructional activities to move the learners towards the learning objectives

With specific learning objectives, the person creating the scenario helps the SMEs understand what learners should come away with from the learning experience and that they should be able to understand, do, and apply to realistic problem situations. To generate characters to personify learners, SMEs determine the strengths and areas to improve upon of each of the characters, as well as adding a touch of the personal by including demographic attributes and hobbies. The learners should see themselves or their colleagues in the characters. Then while crafting scenes with plausible context that reflect the organizational context and the challenges the characters experience, the person running the scenario appropriately integrates resources that the characters would be using, so that the learners are able to use these resources in ways that approximate their uses in professional situations. To ensure that the scenario is dynamic and highly interactive, the creators craft instructional activities that enable learners to think/reflect, focus on applying the knowledge that they are gaining; in doing so, they help learners evaluate their own progress through the scenario with quick checks, and, ideally, enable them to interact in discussion forums in which they can discuss the character's challenges and how they might handle themselves differently in the same situation. Again, preferably, they have these discussions in teams that are facilitated by someone with experience in the field so they can offer their wisdom along the way.

EXAMPLE

Two scenarios are presented here – one for students and one for executives

For students

Many case studies that business students and others use are laden with information that must be analyzed and integrated. Students must work with the data, figure out what is going on in the case, and develop a resolution to the problem outlined in the case. The real world is much different – it is more complex, ambiguous, robust, and less clinical.

In the following example, business students are asked to take on the role of consultants in a team that is asked to diagnose and solve an organizational problem. Consulting team members can't always meet in a single room on a given day, but instead work on multiple assignments simultaneously in multiple locations around the world. They must find ways to use technology to connect "asynchronously"--from various places at various times—to push a project forward. Consulting assignments, like real case studies, unfold sequentially. Data are revealed over time, and consultants have an enormous impact on what data is brought to light and what sense is made of it. Sometimes the problems consultants wrestle with are highly complex, cutting across all organizational boundaries and requiring extensive, deep analysis. Sometimes the problems are relatively more simple and straightforward and the depth and creativity of analysis are far less important than is an understanding of human motivation and organizational culture.

In this scenario, the MBUU Motors consulting engagement, it is up to the student and his or her team members to determine the kind of environment they are working in, the issues they are facing, and the analysis and data is relevant and necessary. They determine what the problem is, what the solution looks like, and develop strategies to help their client to understand the problem and commit to taking the necessary remedial steps. Together the team is actually part of a larger, established consulting team at CNX Consulting. In studying the client's problem, the CNX engagement leader and project manager will make project management decisions, acquire and analyze data, draw conclusions, and work with client management. The larger challenge, however, may not be the analysis that ultimately identifies the root causes of the problem. The consulting team members must develop and present their situation assessment and recommendations for action to the MBUU Motors Group Executive Board in Brussels during the tenth week of the course. To fix MBUU's problem these individuals must be impelled to accept and implement the team's recommendations.

The students, by the end of the scenario, will be able to:

- Apply the consulting frameworks, processes and tools taught in the course to the diagnosis and solution of real organizational problems in a realistic consulting environment.
- Experience the inevitable surprises that surface whenever concepts come face to face with reality.
- Prepare and enable the client environment to successfully implement necessary action steps by:
  - Creating a collaborative relationship with a team of talented, respected client members;
  - Working together in analyzing the problems, reaching conclusions, and formulating solutions;
  - Building client understanding and ownership for the conclusions and recommended actions.
- Create, communicate and sell findings and recommendations that successfully engage the client and address "the real problem."
- Experience key aspects of "real life" consulting. Utilize advanced learning technology to work as a consulting team member, both synchronously and asynchronously, in the same or multiple locations, without allowing time or place to diminish the quality or the timeliness of the work. Simulate the reality of the multitasking and human elements that are characteristic of real consulting and client work environments.

They do all this by going through a scenario with scenes made of up of dialogue, news articles, spreadsheets, and analysis tools that are integrated directly into the story in which the characters use resources they will use beyond the classroom. They also are given numerous opportunities to reflect with probing questions on the risks associated with the decisions they make. By design, the course is highly participatory with real world problems that students are able to address.

For executives

Similar to the situation where students are not dealing with real-world problems, executives are frequently provided with a set of bulleted PowerPoint slides and told this is what they will need to do an aspect of their jobs—typically they are not provided with the context that helps them understand how it is being used with their clients. In this example, a professional consulting company wanted to ensure that its executives understood the context of consulting to departments/ministries of defense around the world. A course that focused primarily on how the acquisition process works in the military was designed to help them gain insight into how a defense client thinks and acts. The client asked that the training program be an innovative and engaging way to prepare to work with a defense service or agency. The company wanted to broaden its executive's understanding of military services/agencies, intelligence agencies, and the unique missions they perform. The company also wanted its executives to experience how defense organizations and people interact both on and off the battlefield, and with allies and coalition partners, so that the knowledge would better prepare them for the unique environment with their client.

By the end of the scenario, the company wanted its executives to be able to:

- Articulate the major components, core mission, and role of departments/ministries of defense and explain how they interrelate;
- Explain the core military processes and functions;
- Describe the trends and challenges associated with departments/ministries of defense.

The story that was created had SFC Ryan Browne highlighting the need for a new interoperable capability when his team was unable to complete a mission for lack of reliable, actionable information. COL Sheryl Lawton worked with Major Kate Slater to begin a rapid acquisition process for this new capability to ensure that this shortcoming caused no further mission failures, and that the new capability addressed the needs of military forces as quickly as possible. Mick Patterson, a

contracting officer for the U.S. Army, and COL Frank Dotson, a program manager, went through the standard acquisition process to make sure that the capability was funded and updated for the long term.

A challenge in scenario based learning for executives is that they tend to have their time fully committed to the exigencies of their businesses. However, experience has shown that once they are exposed to the scenario, they tend to become engaged in the intricacies of the story. In this case, by the end, the executives gained insight into the terminology (hyperlinked glossary), processes, and components of departments/ministries of defense and the trends of the defense industry. Throughout the course, the client contextually linked to their various white papers on the topics that were being addressed. The executives saw direct connections to their specific clients and their experiences. Numerous industry news Web sites were made available for future reference. Executives became familiar with leading research tools and other key documents that their company had been producing to ensure they could learn from their companies' past experiences. If they were new to the industry, this provided a quick and enjoyable way to ensure they were up to speed prior to starting a consulting engagement with their clients. It is also an opportunity for executives to explore the consequences of their own actions and empowers them to feel in control over their own learning

CONCLUSION

This paper has presented scenario based learning, a pedagogical strategy that is rooted in the framework of problem based learning, and a student centered approach that has proven useful in a variety of disciplines. The case has been put forward that scenario based learning is an appropriate pedagogy for use in IS education for both students and executives because of its emphasis on authenticity and use of complex and ill structured problems that are rooted in the work practices of the learners.

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