Are real world projects worth the risk? Evidence from service learning projects

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ABSTRACT

Although service learning provides unparalleled real world experiential student learning opportunities and benefits to four major constituencies – student, faculty, community and institution, it takes place in an uncontrolled environment introducing uncertainty into the instructional process. Faculty might avoid this valuable approach to instruction seeing the uncertainty as additional risk that jeopardizes a major desirable outcome, student learning. This paper provides evidence that a major disruptive event, in this case the client quitting the project before the end of the course, does not limit the student learning levels achieved. The Plato's taxonomy levels of learning are used in a grounded theory approach to gauge learning achieved based on students' reflective papers from two service learning project classes where one client quits during the semester. Effective strategies to manage this major challenge inherent in experiential service learning are presented.

Keywords: Service learning, real world projects, Plato's learning levels, grounded theory analysis, project risk, reflective essays

INTRODUCTION

The frequently asked recruiting question "Do you have experience?" is a major barrier for many graduating seniors when interviewing to begin their careers. Classroom projects provide valuable hands on experiential learning involving skills such as project management (Larson & Drexler Jr., 2009) and innovative technologies such as radio frequency identification (RFID) (Zelbst et al., 2008). However, they do not provide real world experience or the community involvement that service learning can provide. Service learning provides these two valuable opportunities as students learn though a type of experiential learning taking part in real world activities that address the needs of the community and clients with structured opportunities designed to promote student learning and development (Jacoby, 1996).

Service learning has been seen as a way to go beyond the classroom activity linking it to real-world learning (Govekar & Rishi, 2007). Service learning has also been described as a way to create opportunities for students to grapple with the theories they learn in the classroom by applying them to real world problems and real world needs (Kenworthy-U'ren & Peterson, 2005). This prior research confirms what Gale et al., (2007) suggest, that service learning blends instruction and service in a positive manner. Additionally, Gale et al., (2007) suggest three distinct elements that should be involved in service learning projects: planning, experience, and reflection. Each of these stages will be addressed in addition to a discussion of the impact of service learning on Bringle and Hatcher's (1996) four constituencies that benefit from a service learning educational approach: students, faculty, community, and the institution.

Academics recognize further research is needed to evaluate the impact on outcome measures of student performance for service learning project (Wilson, 2008). This study examines the impact of a major disruptive event, i.e. the client quitting, on student learning. To accomplish this investigation two different service learning projects completed in consecutive semesters were analyzed, one semester where the client quit before the end of project completion and one semester with the client participating until the conclusion of the semester.

THE THREE ELEMENTS OF LEARNING

Planning

Both classes had service learning projects involving local real world clients and used the System Development Life Cycle (SDLC) or Waterfall methodology (Valacich et al., 2009) to document the analysis for the clients. The clients were located through the Small Business Development Center based on perceived need, willingness to work with students and fit with the course objectives. The course objectives are: 1) Introduction to factual knowledge such as concepts, terminology, tools and processes; 2) Learning to apply the material to improve thinking, problem solving and decision making; and 3) Acquiring skills working with others as a team member. The designation Group A is used for the class with the client that completed the semester and Group B designated the class with the client that quit after six weeks into the semester.

Experience

The students were grouped into teams where they were instructed to complete each of the four phases of the SDLC – Phase I: Project Planning and Selection, Phase II: System

Analysis, Phase III: System Design, and Phase IV: System Implementation and Maintenance. Completion of the project included a project book that analyzed the client's needs, identified a target issue(s) based on the client investigation/analysis, documented a system design for the recommended solution(s) to the issue(s) and provided guidelines for implementation and maintenance of the recommended solution approach. Throughout the course students were encouraged to: 1) Think outside the box, 2) Be impertinent by questioning everything done for the client, 3) Be impartial to find the best solution for the client not necessarily the solution that fits the students particular area of expertise, and 4) To relax constraints to allow the assumption that anything is possible to be identified, not just what the client has always done (Valacich et al., 2009). The goal of this approach was to create a learning space that gives the students the opportunity to experience the process of problem-solving and being creative in a novel situation.

Reflection

Both the class with the client that quit mid-semester and the class with the client that participated the entire semester were asked to write a reflective paper to evaluate the project on what they had learned throughout the semester. Although the students were in two different classes with two different clients they used the same methodology to approach the project, including identical phases in the same sequence and identical lists of required project documentation. Writing the reflective papers provided students a chance to explore their feelings about what they had learned. The analysis of these reflective essays allowed for categorization of learning levels attained by each student.

THE FOUR CONSTITUENTS

The first constituency is students. Student benefits have been evaluated in several different ways including potential extension of critical-thinking skills (Eyler & Giles, 1999), an enhanced ability to apply general theories and principles to specific situations (Markus et al., 1993), retention and lasting learning of the material presented (Morton & Trope, 1996), active learning for kinesthetic learners and team approach to reinforce learning (Cluskey et al., 2011). This paper suggests that even under extreme classroom circumstances student learning is accomplished.

The second constituency is faculty. Two of the many potential benefits to faculty include positive teaching outcomes and experiences (Caruso et al., 2006) along with greater potential research opportunities (Strand et al., 2003).

The third constituency is the community. According to Bowen et al. (2009), service learning benefits the community partner through improved networking opportunities, supplying needed assistance with work outcomes, and tangible monetary benefits.

The fourth and final constituency is the institution. Truethart (2003) argues service learning has a positive impact on recruitment and retention of students due to practical, relevant learning experiences students encounter. Anecdotal evidence suggests that service learning may benefit the academic institution through a positively enhanced image and greater visibility throughout the surrounding community. While the focus of this paper is on student learning under differing client-based circumstances, all four constituencies are impacted suggesting the importance of service learning as a pedagogical tool.

CHOOSING AN EVALUATION METHOD

One framework used to measure student learning outcomes from experiential learning is Plato's four levels of learning – imaging, perceptual belief, understanding and insight (Zelbst et al., 2008). The framework illustrates forms of awareness which can be used to identify levels of learning or mastery of a concept or field with the final level of insight achieved once the student is in the workforce (Sower & Fair, 2005). Additional frameworks for potential analysis include the Bloom Taxonomy (Zelbst et al., 2008), or Cognitional Theory by Lonergan (1968). Ultimately, the decision on which framework to utilize should come from the language embedded in the student reflective essays. In this case, the coding of the examples of student learning aligned more closely with Plato's levels of learning. Hence, Plato's levels of learning taxonomy is a more appropriate analytical tool for this analysis.

Assessing Learning through Plato's Levels of Awareness

Plato identified four levels of awareness: imaging (eikasia), perceptual beliefs (pistis), understanding (dianoia) and insight (noesis) (Plato, 1992). This hierarchy of awareness can be applied to many fields as: a) Familiarity with representations; b) Personal experience; c) Theoretical understanding; and d) Creative insight (Sower & Fair, 2005). Zelbst et al. (2008) adapted the hierarchy to guide teaching methodology for radio frequency identification technology (RFID) using experiential learning. The taxonomy of Plato's levels of learning are as follows.

Imaging, the lowest level of awareness or learning, is based on the representation of concrete things (Sower & Fair, 2005). In a classroom setting textbooks and lectures can provide these images (Zelbst et al., 2008) making students aware of the representations associated with the course concepts.

Perceptual beliefs or personal experience leading to the second level of awareness can be introduced through class exercises applying the images or "concrete things" presented through the textbook and/or lecture. A hands-on experience, such as a laboratory experience for a chemist (Sower & Fair, 2005), in a controlled classroom setting provides the opportunity for students to see how things work for themselves.

Understanding is the next level of learning achieved through the application of the knowledge learned in previous levels of imaging and perceptual beliefs. Zelbst et al. (2008) utilized an in-class applied experience recognizing that; "It is not sufficient for students to have simply 'heard about RFID' to be successful … [in their field] they must 'understand' the technology" (Zelbst et al., 2008, p.420). Service learning projects for project management (Larsen & Drexel Jr., 2009), banking and economics (Govekar & Rishi, 2007) and nonprofit management courses (Govekar and Rishi, 2007) are examples of outside the classroom applied experiences that have been used to achieve the understanding level of learning. Understanding is the level where the impact of service learning is evident and aligned with the learning space (Kolb & Kolb, 2005) where skills acquired in the perceptual belief level are reinforced and deepened.

This sequence of learning levels, understanding coming after perceptual beliefs, is the determinant for using Plato's framework in this study. In order to "deepen" students' understanding through service learning, the skills necessary to complete the client deliverables must be pre-existing, through prior coursework experience.

Plato placed insight as the highest level of awareness or learning. At this level, an individual would use creativity combined with concrete knowledge to produce entirely new products and/or applications (Sower & Fair, 2005). Achieving the level of insight means that the students could use creativity to innovate beyond the current paradigm.

EVALUATION PROCESS

Following the grounded theory methodology utilized by Warner et al. (2010) three raters with background in both classroom project and experiential learning were chosen to evaluate the reflective papers. The raters were independent of the instructor of the classes. To prepare for the analysis, the raters trained together to ensure they were consistent with the language they saw emerging from the papers. The raters first completed their reviews of each reflective essay for each class independently then met to identify similarities or differences in coding. The raters identified a few major categories or second level constructs which suggested that the best form of analysis would be Plato's levels of learning rather than a different taxonomy. Reflective essay ratings were assigned based on Plato's four levels of learning with the lowest level, imaging, receiving a 1, through the highest level, insight, receiving a 4. When differences between the ratings occurred the raters discussed the differences, showed support for their arguments using the students reflective essay language, and came to a consensus.

Student Learning After a Major Disruptive Event

Criteria were established for the three raters to use for evaluating each student's reflective essay. Consensus was reach between the raters as to each essay's score. First, the mean and standard deviation of each group were examined**.** The students in Group A reached an average of 2.58 and Group B reached an average of 2.5. This indicates that both classes as a whole had passed the level of perceptual awareness and were approaching a level of understanding in Plato's hierarchy (Table 1). Each student was categorized by the level they reached as can be seen in Figure 1. As can be seen, the majority of the students reached or exceeded the level of understanding or level 3.0.

STRATEGIES FOR MANAGING CLIENT PARTICIPATION DISRUPTIONS

"One way of defining 'risk' is risk is a problem that has not happened – yet" (Cervone, 2006, p.256). One of the top risk factors consistently experienced is a a failure to gain user commitment (Keil et al., 1998), for example the client quitting before the course is completed. Several strategies developed during these course experiences have been found effective to mitigate the effects of this major disruption and thereby better manage this type of risk:

1) Build in a safety net for such a major risk in a real world client project by structuring the project with a "backup" client. For these courses the Small Business Development Center (SBDC) was not only a source of clients, but a secondary client as well. Even when the primary target client quit, the SBDC consultant was eager to learn about the student project outcomes to use the information for other clients. Other sources of clients can serve as secondary or "backup" clients such as the local Chamber of Commerce or Rotary Club.
2) The first step of risk management and assessment is risk identification (Cervone, 2006), Therefore, one recommendation is to make risk management be a significant part of the

curriculum for real world projects. One, if not the most disruptive risk event, to lose the client for the project, has been highlighted in this paper as an important starting point to proactively manage the project risks.

3) The traditional saying "with greater risks comes greater rewards" appears to apply here. Emphasizing the great rewards such as service learning and career building aspects of real world projects can provide reasons for working with greater risks.

To support the strategies outlined above a resource list is provided to support service learning project planning (see Appendix).

CONCLUSION

Listening to lectures and reading textbooks, the conventional modes of learning, are particularly vulnerable to producing superficial understanding (Colby et al.,2003). Thus, verifying the achievement of the desirable learning levels in an experiential service learning approach, despite the advent of a major disruptive event during the semester, can provide motivation for faculty to make the extra effort to manage potential risks in an effort to lay groundwork for the students to achieve greater learning. The finding from this study indicates that educators do not need to avoid the risks of the uncontrolled real world when using service learning in a classroom environment because the evidence points to the students reaching the same level of learning whether or not a significant disruptive event occurred.

The reasons for using a service learning approach to education can be summed up by Colby, et al. (2003) who suggests "lecture courses often do not support deep and enduring understanding of ideas and are even less well suited to developing the range of problem-solving, communication, and interpersonal skills" (p. 132). These interpersonal skills, communication skills, and problem solving skills are exactly what corporate recruiters are looking for in future employees (Kolb & Kolb, 2005) and address the question asked at the beginning of this paper, "Do you have experience"?

This evidence and analysis supports the students as a major constituency of the service-learning method. Final support comes from the students themselves. "Being involved in a 'hands-on' project like this was definitely a great plus", "Being able to offer worthwhile information and advice to real people is a meaningful experience", and "This semester I learned and gained insights I believe will help me in the world outside of the classroom" are but a few of the dozens of positive student evaluations of the service learning method received through the reflective essays analyzed for this study.

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APPENDIX

Resource List

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- U.S. Chamber of Commerce. Retrieved 8/10/11 from website: http://www.uschamber.com/about
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Table 1: Summary Statistics

Students (number)	Statistics		
	Mean	Standard deviation	% (LL ≥ 3.0)
Group A (12)	2.58	1.00	66.7
Group B (10)	2.50	0.50	60.0

t-test critical value=0.229; P-value=0.821; LL: level of learning

Figure 1: Student learning levels comparison – Group A vs. Group B