AC 2008-1388: COGNITIVE MAPPING IN SERVICE LEARNING AND CIVIC ENGAGEMENT IN A STUDIO COURSE WITH AN ADA ACCESSIBLE PROJECT

Suining Ding, Indiana University-Purdue University-Fort Wayne (Eng)

Suining Ding is an assistant professor with Indiana University Purdue University Fort Wayne. She has been actively engaged in innovative teaching. Her research interests include 3D digital modeling, Cross-cultural comparison of architecture, cognitive perceptions of interior space, relationships of human behaviour and environment.

Cognitive Mapping in Service Learning and Civic Engagement in a Studio Course with an ADA Accessible Project

Abstract

Research findings confirm that service learning can benefit students, faculty, institutions, and communities by offering "real world" experience to students and quality design solutions to communities or organizations.[2, 7] Currently, many universities have integrated service learning and civic engagement in university mission statement and curricula. However, the students' emotional and psychological pattern in the design process through service learning has not been explored. This paper presents the result of the assessment of a service-learning project in a studio course for sophomore students majoring in interior design. The project is to design a single family house for Habitat for Humanity with an ADA accessible bath and kitchen. Data from students' reflective journals is used to draw a descriptive map of the social-psychological stages that occur during service-learning. In addition, textual analysis reveals that students progress through three identifiable stages of development: exciting but lost, comfortable, and engagement. The recommendations were made to the body of knowledge of service learning. To increase the effectiveness of service-learning outcomes, faculty members must understand these specific cognitive processes that accompany community-based learning.

Statement of Purpose

This paper addresses the social-psychological aspects of students' participation in the design process of an ADA accessible project for Habitat for Humanity (Habitat). Habitat is a self-help housing organization devoted to build "simple, decent, and affordable" housing for low income families. Homes are built using volunteer labor and are sold at no profit, with no interest charge on the mortgage. Accessibility is an important issue in current housing design for Habitat. An accessible house is one that can be approached, entered, and used independently by people with mobile disabilities. The nature of the project provides unique opportunities for students to understand the role of public service in making meaningful social contributions. This is a 4-week studio project that joins students, faculty and community partners together. Besides traditional design studio activities, students, faculty, and community partners worked together to help students experience a real project design process and real client interactions. Students have the opportunity to explore the links between community service and interior design. This project addresses several 2007 CIDA (Council for Interior Design Accreditation)[4] indicators regarding codes and regulations, barrier-free design guideline, as well as professional values and community service. The reason this course differs from most other courses is the students' work and design will become a community partners' potential design solutions.

According to Dewey's [6] learning-by-doing theories, participation, or doing action involved in learning experience can lead to personal growth and professional growth. Service-learning in higher education is intended to increase students' civic responsibility and enhance learning. The

hypothesis was that engaging in service learning enhanced learning outcomes, and it benefits both students and community partners. While a quantitative assessment of these two outcomes has dominated existing literature,[11] this paper explores the cognitive processes that students undergo during the community service learning experience. Data obtained from reflective journals draws a descriptive map of students' psychological stages that occur during service-learning. In addition to reflections from journals, a summative assessment method was used in this course to measure the learning outcomes.

Review of Literature

Emotional and Psychological pattern in Participation of a Service Learning Project

Service learning is a credit-bearing educational experience in which students participate in an organized service activity that meets identified community needs and reflects on the service activity in such a way so as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility. Community oriented service learning offers a positive outcome for all involved parties by providing resources to fulfill community needs that would otherwise be left unattended. The academic curriculum is also enhanced, regardless of the field of study, in three critical areas of student development: "relevant and meaningful service to community", "purposeful civic learning", and "enhanced academic learning". [8] It is obvious that service-learning differs from professional internship or volunteerism since the activity always takes place within a curricular infrastructure.

Service-learning is a method of teaching, learning and reflecting that combines academic classroom curriculum with meaningful service to the community. As a teaching methodology, it falls under the philosophy of experiential education. More specifically, it integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, encourage lifelong civic engagement, and strengthen communities for the common good.

Service-learning researchers and practitioners agree that reflection is the essential link between community experience and academic learning: reflection is the hyphen in service-learning. [11] However, the theoretical and pedagogical foundations for service-learning reflection pays scant attention to the emotional content and context of student service experience or to the positive role emotion may play in helping students connect experience with academic study. Recent research in cognitive psychology and neuroscience reveals emotion's central role throughout the thinking and learning process [9]. Therefore, exploring students' emotional and psychological pattern in service learning process becomes an important part of adding valuable suggestions to the body of knowledge of service learning and to improve the effectiveness of engaging in the service-learning teaching method.

John Dewey's related concerns to revitalize education and to rebuild community and democracy at the local level have powerfully appealed to service-learning advocates. Yet rarely have students been engaged directly as neighborhood organizers, a role that, from Dewey's perspective, would appear to have great educational and social promise.[5] Although there are

amount of literatures regarding service learning based on John Dewey's theory, there is little literature that explains students' emotional and psychological pattern during the process of participation in designing service learning project. This paper explores this area by using the data from students' reflective journal. The method of data analysis is statistics analysis software called "SPSS". The system will draw the curves after the data is imported in the system.

Assessment of Service Learning Outcomes

Ash [1] indicated that intentionally linking the assessment of student learning outcomes of service-learning with reflection allows each to inform and reinforce the other. Tracing the evolution of a strategy that uses reflection products as data sources to assess and improve both individual student learning and a program-wide approach to reflection is an effective way of assessment. Ash used two tools to guide the process of reflective writing in two courses. Associated rubrics were used to evaluate the quality of thinking demonstrated in the written reflection. Ash's results suggest that these tools can improve students' higher order reasoning abilities and critical thinking skills relative to academic enhancement, civic engagement, and personal growth. As a result, students can improve the overall quality of their thinking and learning. Based on this research finding, reflective journals were used as a data source to assess learning outcomes and draw cognitive maps, which is the purpose of this study.

One of the learning outcomes in this course is to obtain knowledge of ADA design standards for bath and kitchen design. There are two main types of assessment:

- Summative assessment - Summative assessment is generally carried out at the end of a course or project. In an educational setting, summative assessments are typically used to assign students a course grade.
- Formative assessment - Formative assessment is generally carried out throughout a course or project. Formative assessment, also referred to as educative assessment, is used to aid learning. In an educational setting, formative assessment might be a teacher or a mentor (or a peer), or the learner, providing feedback on a student's work, and would not necessarily be used for grading purposes.

Therefore, in addition to writing a reflective journal, which is a formative assessment, a summative assessment was utilized at the end of the semester. The summative assessment is a written exam that contained multiple choices, fill in blanks, and open ended questions. The summative assessment concentrated on ADA design principles and regulations. The formative assessment focused on the emotional and psychological impact during the service learning process.

Cognitive mapping

Cognitive maps are a type of mental processing composed of a series of psychological transformations by which an individual can acquire, code, store, and recall information regarding the relative locations and attributes of phenomena in their everyday or metaphorical spatial environment. Burning [3] stated that the cognitive perspective on learning has much to offer in

3

making improvements to higher education. Steinke and Buresh [12] indicate that cognitive psychology has long emphasized the importance of accessing prior knowledge when obtain more knowledge. Prior knowledge has been conceptualized as schemata or knowledge structures that provide a mental framework for organizing knowledge, suggesting that cognitive learning can be assessed in part by how closely knowledge organization and knowledge transfer matches that of the instructor. [12]

In its simplest form, Robinson and Petchenik [10] drew the cognitive map that shows the communication model. It portrayed maps as "channels" to transmit information from a source (the world) to a recipient (map reader) (Figure 1). Additional complexity may be added, such as an encoding process from the source to the map, a decoding process from the map to the recipient, and the possibility of "noise" in the transmission. Using this model as the framework of this study, a cognitive map had drawn to reveal students' emotional and psychological pattern during the service learning process while students designed an ADA accessible project.
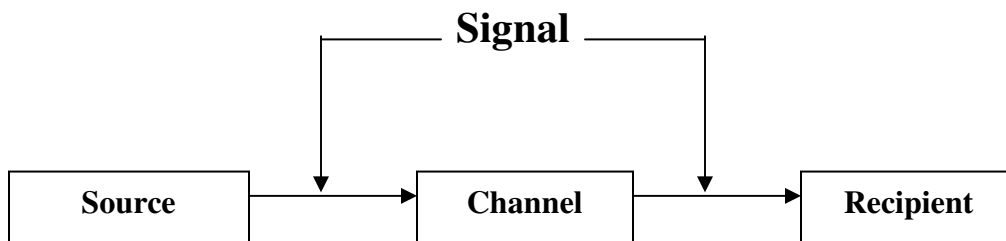
Figure 1: Simple Framework for Communication Model (Robinson and Petchenik (1976)

Process and Methodology

Project Description and Studio Activities
The project is to design a prototype floor plan with ADA accessibility in kitchen and bathroom for Habitat for Humanity. The project fits into the curriculum very well. The learning objectives of this sophomore studio course are bath and kitchen design and ADA clearance requirements. The project not only provides the opportunity for students to apply the knowledge that they learned from class, but also engages students in community service activities. In the project, a handicap lavatory, toilet seat and roll-in shower are required. Students are required to conduct their preliminary research in order to get familiar with ADA fixtures. The client from Habitat for Humanity was invited to the class when the project was assigned. Students had the chance to ask the client's questions. The client gave some background information about the project and their organization. The client was invited to the classroom again during the second week of the project so that the feedback could be obtained. Finally, a juried presentation and design critique was held. Client from Habitat for Humanity was also invited to the presentation as part of jury. Student peers were encouraged to express their opinions and ask questions during the critique sessions.

4

Reflective Journal and Methodology

Reflection is a crucial component of this service learning project. It serves as the bridge between experiences and learning, as well as a vehicle of assessment. During the project development students were required to record their own reflective journals. It is intended to provide students with additional opportunities to consider how community-based learning experiences shape their own learning as well as contribute to their personal and professional development. On-going feedback, analysis, and reflections revealed outcomes of this community design experience, some of which were anticipated; others emerged because of the depth of design process and design analysis. The learning outcomes were assessed by a written exam and this Habitat single family house project required in compliance of ADA design.

The rubrics were given to students before the reflective journal was assigned. The intent was to gather data on students' psychological aspects during three different stages of learning process. The three different stages were identified as beginning of the process, middle of the process and the end of process. The followings are the rubrics that need to be included in the reflective journal:

- Your reaction to the Habitat project before it was assigned
- Your reaction to the ADA design content at the beginning of the project
- Your opinion about the community partner be involved in the design process
- Your opinion about the involvement in the community service
- Your experience during the design process
- Your experience during the design critique
- Your experience of personal growth
- Your experience of professional growth

Eleven reflective journals were received. Based on the rubrics, student feedback was processed from a qualitative data to a quantitative data for data analysis and presentation. The following figure demonstrates frequency distribution of the response from the reflective journals after data conversion and analysis.
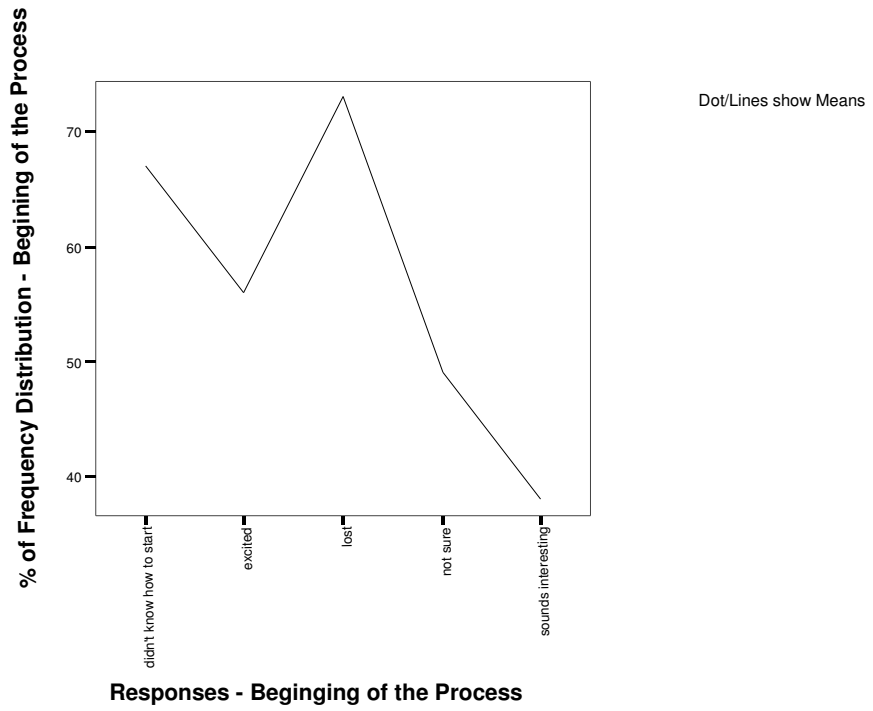
5

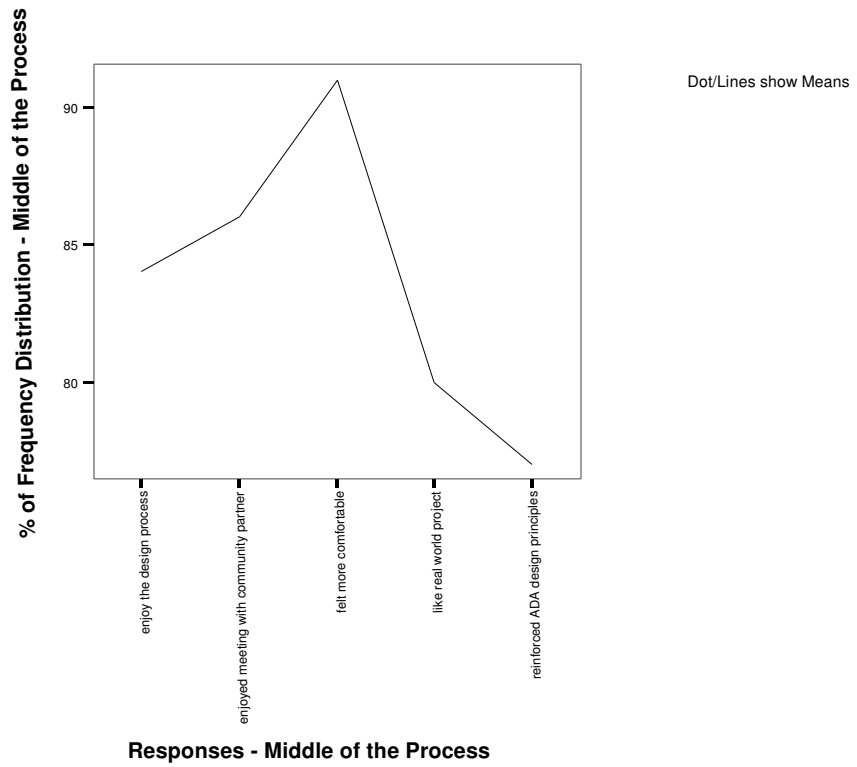Figure 2: Response at the beginning of Service Learning Process

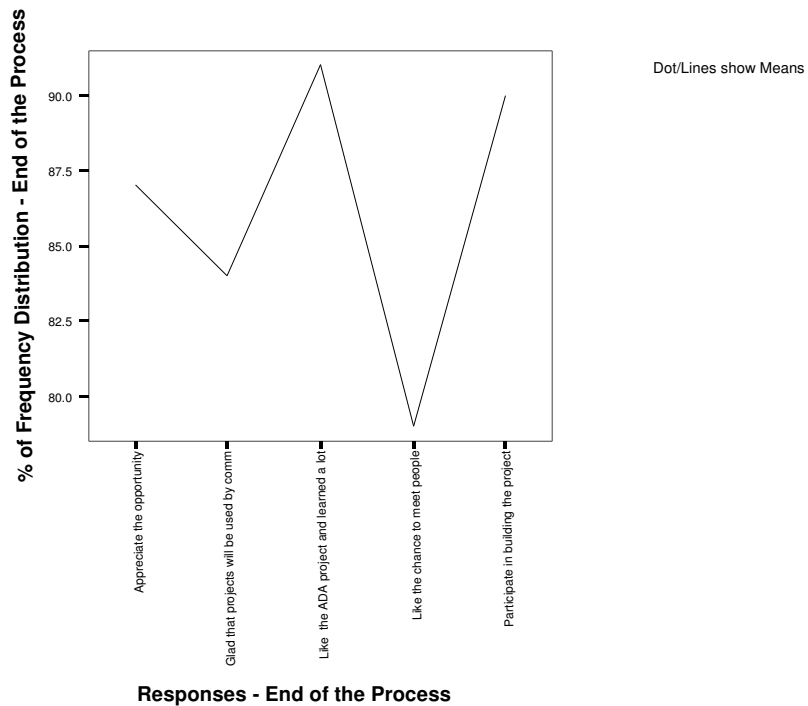Figure 3: Response during the middle of Service Learning Process

6

Figure 4: Response at the end of service learning process

Data Analysis and Cognitive Map

Data collected from the reflective journals was converted to quantitative data before processing. They were then categorized for three stages, the beginning of the service learning, the middle of the service learning and the end of service learning. There was lots of other feedback that came from the journals. The responses were categorized in the above figures. It is evident that the peak of the curve in the Figure 2 is "lost" at the beginning of the process. Most of students felt lost and didn't know how to start their design projects at the beginning of the process. In Figure 3, the peak of the curve indicates that students felt more comfortable and started enjoying the design process as projects proceeded. Most of students enjoyed interacting with the community partner. They appreciate the fact that their design might become community partner's potential solution. In Figure 4 the peak of the curve shows the students responses at the end of the process. Most students got fully engaged in the project and appreciated the unique opportunity to apply their knowledge in a real life project. Some students even volunteered to participate to build the house later on.

The followings are the quoted responses from student reflective journals:

"When first introduced to this assignment, I immediately was intrigued. The idea of our group of interior design students actually participating in a real world project to assist the lives of the less fortunate in our area seemed so exciting, and I could not wait to start. When I began the initial sketches to work out the floor plan, I found the project to be somewhat more challenging than I

7

had expected at first….. I found I struggled to map out my plan using the small amount of space to the best of its capability."

"I had a great time trying to incorporate all of the requirements while making it ADA approved. There were many challenges that came from the compact floor area/ space…."

"Finding the right solutions was trial and error. Even after having the rough sketches, when drawing them on AutoCAD I found that some areas were not working and found better was to do things. The main difficulty was having most of the house be ADA accessible. After much time, dedication, and research the plan came together."

"Throughout this process I learned a lot about the entire process of home design, specifically for an ADA residence. It surprised me how much more difficult it was to design a home that could possibly be constructed exactly as I had specified, it forced me to pay attention to detail, and imagine the home as complete structure…."

"The last reason I feel the time was of value for this project was that we got a glimpse of what other people are doing in the real world. We got a chance to take our minds out of doing homework and act like we were doing a job. The best reward with doing a job was also given a chance to help the community."

"I am very happy to have had the opportunity to be a part of this project. I feel very fortunate to be able to provide any type of service I can. I have signed up to be part of a build team with Habitat…."

"I feel that the values I learned were very important, it is incredible imperative to be able to design a home with a budget, time schedule, and with the guidance of a client. What I have learned by doing this project will stick with me the rest of my life."

Based on the responses for the three different stages, a combined curve shows the cognitive process with three identified stages: Lost, Comfortable and Engagement (Figure 5). Base on this curve, a cognitive map was drawn as the following:
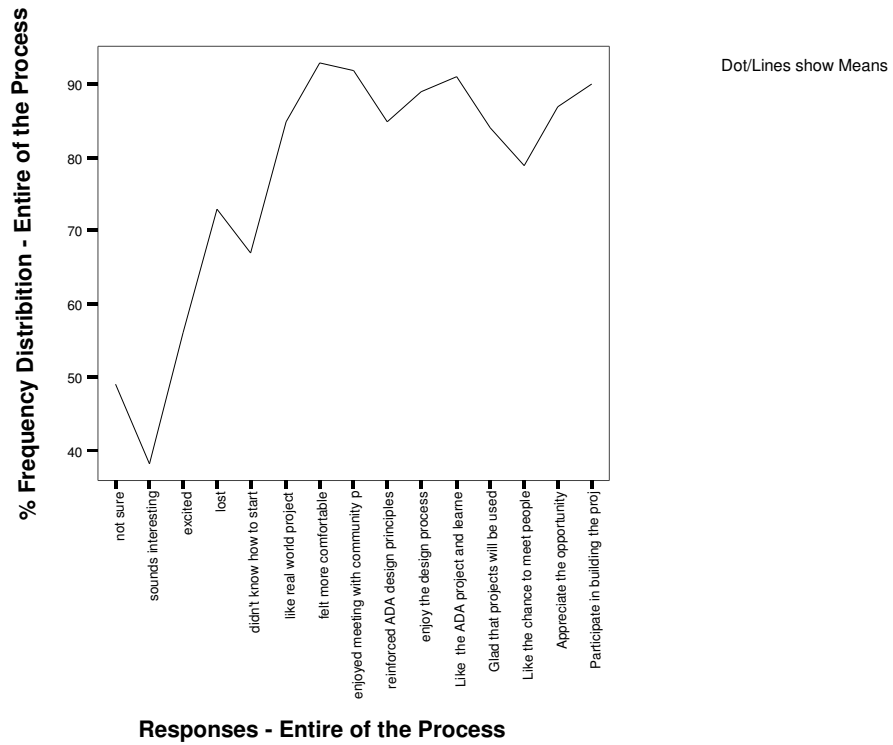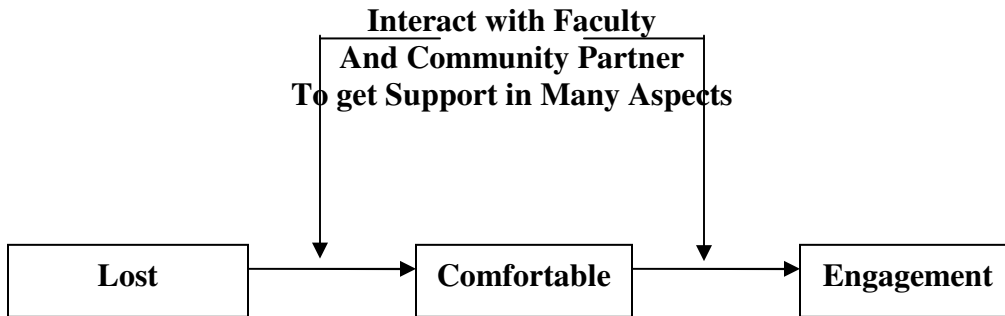
8

Figure 5: Combined Curves for Three Stages

Figure 6: Cognitive Map Drawn based on the Data from the Reflective Journals

Limitations of the Study

There are several limitations in this study. First of all, this study is a pilot study and it should be confirmed by other studies with different methods, such as questionnaire and structured

interview. The sample in this study is small because of small size of class. Therefore, the population should be increased for future studies as the same course is offered in the future.

Conclusion

In conclusion, this paper documents a service-learning project that successfully accomplished several learning objectives that are mandated by the curriculum and the accreditation standards. Data gathered from student reflective journals is used to draw a cognitive map of service learning, which reveals students' emotional and psychological pattern in the process. The textual analysis shows that students progress through three identifiable stages of development: exciting but lost, comfortable, and engagement. The recommendations were summarized as the following:

Active Listening to Obtain Information. Experiential learning is an effective approach of gaining familiarity, sensitivity, and understanding of the meaning, articulation, and behavior in the built environment. Having the students discover the design program through interviews, participatory critiques and panel meetings will enhance their level of engagement in the project. Students have gained active communication skills leading to effective comprehension and interpretation of client requirements and needs.

Effective Communication. Service learning programs that employ appropriate and varied reflection strategies heighten students' communicative abilities. Through reflecting on their service experiences, students are called upon to give an account of themselves and their thoughts in classroom discussions, in oral or artistic presentations, and in their writings.

Faculty and Community Partner's Involvement. It is very important to get faculty and community partners involved in service learning process. It is evident in the cognitive map that students need help and guidance at the beginning of the design process. It is crucial to provide guidance and help to students not only in knowledge aspect, but also in emotional and psychological aspect. Showing support to students will make the transition easier from "lost" stage to "comfortable" stage. Faculty and community partner's effective involvement also can make students deeply committed to engage in the community service learning process.

The author intends to use this project as a framework to stimulate discussions about merits of service learning. The cognitive map and textual analysis reveal students' emotional and psychological pattern in service learning. In order to increase effectiveness of service learning outcomes, faculty members must understand specific cognitive process. Contributing design solutions of the built environment is a valuable goal for both students and the community.

Bibliography

1. Ash, S., Clayton, P. and Atkinson, M. (Spring, 2005). Integrating Reflection and Assessment to Capture and Improve Student Learning . *Michigan Journal of Community Service Learning.* Volume 11. No.2.

2. Astin, A.W.& Sax, L.J. (1988). How undergraduates are affected by service participation. *Journal of College Student Development, 39(3), 251-263*

3. Bruning, R. H**.** (1994). The college classroom from the perspective of cognitive psychology. In K.W. Prichard & R.M. Sawyer (Eds.), Handbook of college teaching (pp. 3-22). Westport, CT: Greenwood Press.

4. Council for Interior Design Accreditation (2007). Accreditation manual: Professional Standards 2007. Grand Rapids, MI.

5. Cummings, C. Kim (2007). John Dewey and the Rebuilding of Urban Community: Engaging Undergraduates as Neighborhood Organizers. *Michigan Journal of Community Service Learning.* Volume 7.

6. Dewey, J. (1913). *Interest and Effort in Education*. Boston, New York: Houghton Mifflin company.

7. Hesser, G. (1995). Faculty assessment of student learning: outcomes attributed to service- learning and evidence of changes in faculty attitudes about experiential education. *Michigan Journal of Community Service Learning, 2, 33-42*.

8. Howard, Jeffrey (2001). Michigan Journal of Community Service Learning: Service-Learning Course Design Workbook (Ann Arbor: OCSL Press the University of Michigan 2001)

9. Elon, Peter (Spring, 2006). Emotion and Leaning: Feeling our Way Toward a New Theory of Reflection in Service-Learning. *Michigan Journal of Community Service Learning.* Volume 12, No.2.

10. Robinson, A.H., and B.B. Petchenik. 1976. *The nature of maps*. Chicago, Illinois: University of Chicago Press.

11. Rockquemore, Kerry (2007). Toward a Theory of Engagement: A Cognitive Mapping of Service-Learning Experiences. *Michigan Journal of Community Service Learning.* Volume 7.

12. Steinke, P. and Buresh, S. (Spring, 2002). Cognitive Outcomes of Service-Learning: Reviewing the Past and Glimpsing the Future. *Michigan Journal of Community Service Learning.* Volume 8, No. 2.