

PUBLIC PARTICIPATION GIS AND CLASSROOM-BASED PROJECTS:
EVALUATING THE OUTCOMES FOR STUDENT PARTICIPANTS

By
DARREN SCOTT WYSS

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This Terminal Project is approved and accepted by:

Professor Marc Schlossberg, PhD, Chair of the Examining Committee

Date

Committee in Charge: Marc Schlossberg, PhD, Chair
Megan Smith, MCRP

Abstract

The concepts of public participation GIS (PPGIS) and community-based research (CBR) have recently received increased interest by professionals because of their “bottom-up” approach to planning. Although the structure of PPGIS and CBR projects vary, including university community partnerships, evaluations have predominately focused on community outcomes. Recently, a classroom-based PPGIS project was completed at the University of Oregon that used a service-learning model to develop a partnership between community and student participants. Through several reflection exercises, this research assesses student outcomes from participating with the community and the impact on their educational experience as well as what such a project contributes to the concepts of PPGIS and CBR.

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CHAPTER I

INTRODUCTION

Many professionals in the planning field have identified public participation as an important aspect of the planning process. This is particularly true at the local level where neighborhood residents need to be empowered to help develop ideas and plans that reflect the wishes of the community (Jones, 1990). Many different approaches to participation have been taken in the past, but recently there has been an interest in a “bottom-up” approach that puts more of the planning process in the hands of the residents. This “bottom-up” approach to planning has helped to generate an increase in research surrounding the topics of public participation GIS (PPGIS) and community-based research (CBR).

PPGIS seeks to make GIS technology and training accessible to local residents as an empowering tool to use in the decision-making process, while CBR emphasizes the inclusion of community members as research partners to improve the practicality and responsiveness to local needs. The opportunity to apply these concepts arose with a local neighborhood group in Eugene, OR. A classroom-based PPGIS project was developed and implemented during the Fall term of 2004 at the University of Oregon and utilized the principles of service-learning to maximize student benefits from participation in the project. The evaluation of the project serves as the basis of the research that was undertaken and is presented in this document.

Background

The topics of CBR and PPGIS are important to the planning profession and some great projects and research has evolved from these concepts. Many interesting results have been attained through hard work and collaboration, while enlightening professionals on different strategies that are effective in empowering communities and increasing participation. During the planning of the classroom-based PPGIS project that is the focus of this research, a number of projects implemented by universities were found. In most cases, the projects were undertaken in partnership with a local community organization that had expressed a desire to improve conditions in their neighborhood. These university community partnerships will often include student researchers to promote their professional development and to enhance their learning experience. This is beneficial to both parties as it allows the neighborhood residents to utilize the resources of the university, while allowing theory and practices to be tested through a service to the community.

Also uncovered, while researching previously implemented projects, was the focus of evaluations on the tangible outcomes for community organizations. These topics seem to be particularly interesting to the planning profession because of the ease of measuring the outcomes by the researcher. Money that was secured for projects, training and skills acquired by residents, and plans that were written are just a few examples of these tangible outcomes. The predominant focus on what the local community gained from the process is a great issue and an interesting research topic; however it is missing

another important component to the process when dealing with a university community partnership. This component, student involvement, was a primary part of the classroom-based PPGIS project that was undertaken. The project, which was a successfully implemented service-learning endeavor, gives the chance for assessment of this very component that is too often overlooked.

The significance of empowerment and public participation goals in PPGIS and CBR are not being ignored, but this research is acknowledging the importance of evaluating student outcomes from such a project. An assessment of the project allows for a better understanding of what future planning professionals perceive as the value of PPGIS and CBR. This is not only true for the perception of the empowerment of residents, but also for their own educational experience. A positive experience could help to persuade the student participants to develop such an undertaking in their future careers, which would help to advance the research of these concepts. At the same time, a negative experience could discourage any further participation in such a project.

By evaluating student outcomes from the classroom-based PPGIS project, a better understanding will be had about the value to student participants. Additionally, this knowledge will help to improve the collective benefits that all participants in such a project are receiving and to advance the significance and research of the concepts of PPGIS and CBR.

Purpose of the Research

The purpose of this research is to evaluate student outcomes from participating in a classroom-based PPGIS project. Service-learning principles were used to develop the project and the six data collection instruments that were employed to gather reflections from students on their outcomes. This research will help to better understand the value of PPGIS and CBR projects from a perspective that has been overlooked in previous evaluations. The findings from this research will help to develop future classroom-based PPGIS projects that are beneficial to all participants and to the advancement of research and knowledge about these concepts.

Balance of Paper

The following chapter will provide a detailed literature review on existing research related to public participation GIS and community-based research. It will cover their structure as well as their importance to community empowerment and participation. Service-learning principles that were utilized to develop the project and evaluation tools will also be outlined.

Chapter 3 will describe the classroom-based PPGIS project that was evaluated. A detailed account of the conception, planning, and implementation will be presented. The methodology chapter will follow with a discussion of each of the six data collection tools that were used and why they were important to the completion of this research. Chapter 5 will present the findings from the research. Chapter 6 will analyze the findings and

present recommendations for future projects that may be developed as well as for the larger theoretical and conceptual research that will be undertaken in the future.

Chapter II

Literature Review

This literature review will outline three concepts that have been studied for their effects on increasing public participation and the empowerment of communities. The first, public participation GIS (PPGIS), is a concept that has gained interest in the past decade and recognizes that GIS applications are a potential tool to facilitate public participation and decision making (Schlossberg and Shuford, 2005). Several models of PPGIS will be presented and a closer look at the university-community model will be undertaken. Secondly, the concept of community-based research (CBR) will be introduced. The primary ingredient of CBR is making the community a partner in the process, from project planning to implementation and analysis. A university-community partnership is prevalent within this concept and the benefits to the partnership will be explored. Finally, service-learning concepts will be presented to explore the role of the student in projects aimed at increasing community participation and what outcomes can be expected for students from participation in such a project. Service-learning evaluation models and the appropriate questions to be answered for an accurate assessment will be presented.

Public Participation GIS

The phrase public participation GIS (PPGIS) comes to the GIS community from the planning profession (Obermeyer, 1998). The phrase can be used to describe a “variety of approaches to making GIS and other spatial decision-making tools available and accessible to all those with a stake in official decisions” (Obermeyer, 1998). PPGIS embodies the desire to utilize the capacity of GIS to engage and empower the public because planners realize the critical importance of community input in decision-making. However, PPGIS approaches often differ from project to project, from internet-based map servers to field-based development methods, undertaken in the spirit of PPGIS and opinions on the appropriateness of using the term for each are divided. Thus, Schlossberg and Shuford (2005) recommend “understanding how specific publics are linked to specific types of participation is an important effort to undertake so that users of PPGIS ideas can appropriately characterize, utilize, implement, and evaluate their PPGIS efforts” (page 15).

Although no consensus has been reached on a clear definition of PPGIS, the debate has progressed into a more constructive research engagement in which community empowerment through GIS is a stated intention (Harris and Weiner, 1998). What scholars and practitioners see in common is that GIS can facilitate a broader set of participants in the planning process due to its visual orientation when addressing spatial issues (Al-Kodmany, 2001). This process of spatially investigating an issue through

PPGIS can produce positive returns in group dynamics, consensus building, and joint planning (Schlossberg and Shuford, 2005).

In order to ensure the realization of the positive returns of PPGIS, Leitner et al. (2002) formulated six models for successfully making GIS available to community organizations. The six models are: community-based (in-house) GIS, university-community partnerships, publicly accessible GIS facilities at universities and libraries, map rooms, internet map servers, and the neighborhood GIS center. Each model inherently contains certain advantages and disadvantages, such as money and time, which need to be considered when assessing the appropriateness for a community. Flexibility and responsiveness, as well as difficulties of implementation and maintenance should be the primary focus of any assessment because they influence the capacity for broad inclusion and empowerment (Leitner et al., 2002).

All models outlined by Leitner et al. are valuable, but the university-community partnership is of particular interest because of the possibility of adding the component of service-learning to the project. This thread of PPGIS is often overlooked and provides for an interesting model of building community capacity and empowerment. A common approach is to require students in urban GIS courses to assist a community organization in developing a GIS application based on a community request (Leitner et al., 2002). The student research teams can assist with data collection and analysis as well as map making, which not only helps the community realize the benefits of GIS, but can also enhance the learning experience of the students. Sawacki and Peterman (2002) found

that “an ideal PPGIS could be where neighborhood residents collect their own spatial data and process it themselves using GIS software”. Service-learning PPGIS could be a step towards that “ideal”.

After the development of a PPGIS model and the implementation of a participation project, a means of evaluating the project must be found. Jordan (2002) found that PPGIS evaluation is often not conducted with enough rigor, making it difficult for others to properly learn from past efforts. Barndt (2002), upon observing the role of GIS as a tool for participation, developed a set of criteria for the evaluation of PPGIS to encourage a more rigorous evaluation process. The focus of the criteria is on the value of the project results, particularly for the community. Measurements such as the accuracy and appropriateness of the information and the timeliness and insightfulness of the data are primary focuses of the evaluation criteria. This information is essential in understanding the level of empowerment for the community, as this is a goal of PPGIS. However, when considering the model of university-community partnerships and the role of service-learning in PPGIS, this form of evaluation only touches half of the participants involved. The students are involved to provide a service, but to also gain educational value from the process. Using the service-learning principle of reflection could help to understand the benefits to the students (Leitner et al., 2002).

Community-Based Research

The concept of community-based research (CBR) is predicated on including the community members as research partners and active participants in a community-based project (Checkoway, 1997). This emphasis on the participation and influence of nonacademic researchers in the process of creating knowledge is what Israel (1998) identifies as the fundamental characteristic of CBR. Viewing the community as a social entity instead of simply a place or setting (in which community members are not actively involved) is the critical distinction between CBR and other research processes (Hatch et al., 1993).

The more traditional “professional-expert” model, where project decision-making power is concentrated in the hands of the researcher, often produces results that are impractical and unresponsive to local needs (Whyte, 1989). CBR, by involving the community in the research processes, attempts to overcome the “professional-expert” shortfalls. For example, equitable participation and shared control over all phases of the research process is a goal to strive to achieve for beneficial results (Green et al., 1995). A participatory bottom-up approach involves the community throughout the process, from identifying the issues examined to participating in data collection to analysis and discussion of the action steps (Heskin, 1991). This empowerment approach can lead to a greater community ownership of the project and significantly increase the participation of local residents (Reardon, 1998). Additionally, CBR can introduce communities to the

university knowledge that is readily accessible to them when needing resources to which they were previously unaware (Checkoway, 1997).

The university has a variety of resources, such as faculty expertise in academic disciplines and professional fields, to contribute to the community and collaboration has benefits for both parties (Checkoway, 1997). The community can gain consultation and technical assistance, as well as durable linkages with the university; while CBR can provide opportunities for students to serve the community and learn from experience (Checkoway, 1997). Patton (1995) suggests that universities ignoring that their destiny is intertwined with residents lacking resources are making a serious mistake by not having that local orientation.

CBR utilized as a service-learning activity helps improve communication with constituencies, makes knowledge more accessible, and builds support for university-community partnerships that help higher education fulfill its responsibilities to society (Checkoway, 1997). These are very important aspects of the scholarship of integration, application, and teaching (Boyer, 1994).

Service-Learning

The term service-learning has come to be applied to a very wide range of activities, from tutoring programs across grade levels to community tree plantings, and with students from kindergarten through higher education (Waterman, 1997). Although there is no agreed upon definition of service-learning, the basic requirement is a service

experience that it is both personally meaningful and beneficial to the community (Pritchard, 2002). The Commission on National and Community Service suggests four key components to service-learning, which will form the theoretical basis for this research. Service-learning is a method:

1. under which students learn and develop through active participation in thoughtfully organized service experiences that meet actual community needs and that are coordinated in collaboration with the school and community;
2. that is integrated into the students' academic curriculum or provides structured time for the student to think, talk, or write about what the student did and saw during the actual service activity;
3. that provides students with opportunities to use newly acquired skills and knowledge in real-life situations in their own communities; and
4. that enhances what is taught in school by extending student learning beyond the classroom and into the community and helps to foster the development of a sense of caring for others. (National and Community Service Act of 1990, page 5)

The basic idea behind service-learning is to use a community or public service experience to enhance the meaning and impact of traditional course content (Sax and Astin, 1997). Dewey (1916) viewed the community as an integral part of educational experiences, because what is learned in the school must be taken and utilized beyond its bounds, both for the advancement of the student and the betterment of future societies. Dewey (1956) later helped advance the view that active student involvement in learning was an essential element in effective education. Service based learning has been shown to be an effective educational approach to improve student learning (Markus, Howard, and Peterson, 1993; Boss, 1994; Cohen and Kinsey, 1994) and carefully designed

service-learning experiences can lead to profound learning and developmental outcomes for students (McEwen, 1996).

One key element of service-learning is for the participants to engage in reflective exercises of the learning activity (Dewey, 1916; Waterman, 1997). This reflection entails the ability to stand back from an experience to discover the connections between actions and their effects (Silcox, 1993). From a pedagogical perspective, properly designed service-learning courses relate the community service experience to the course material and require that students contemplate their experiences through writing, discussion, and/or class presentations (Sax and Astin, 1997). This reflection allows the students the opportunity to incorporate concepts from the academic field they are studying and to make connections between classroom learning and applied experience.

Reciprocity is also an essential element of service-learning where an environment is created in which the students and those being served are both teaching and learning. Thus, reciprocity creates “a sense of mutual responsibility and respect between individuals in the service-learning exchange” (Kendall, 1990, p 22). Helping to facilitate this exchange, Karasik (1993) found that service-learning encourages students to do things with others rather than for them and everyone should expect to change in the process. Thus, it is vitally important that the human and community needs, addressed by service-learning, are those needs that are defined by the community and benefit all participants (Jacoby, 1996).

In terms of service-learning outcomes, Sax and Astin (1997) found that the “real world” value of service participation reveals itself in the positive effects observed in three areas of student satisfaction: leadership opportunities, relevance of course work to everyday life, and preparation for future career. They also identified additional benefits in terms of a number of college outcomes, including students’ commitment to their communities, skills in conflict resolution, and understanding the community problems.

These benefits of service-learning can be broadly defined into four categories:

1. enhancement in the learning of material that is part of the traditional in-school curriculum,
2. promoting personal development,
3. fostering the development of civic responsibility and other values of citizenship,
4. benefits accruing to the community (Waterman, 1997).

Enhancement in learning is based on the student developing a better understanding and appreciation of academic material by putting it into meaningful practice (Waterman, 1997). The abstract quality of classroom and textbook concepts can lead to questions of relevance, while integrating this academic material into a community service activity can make the value of the content more evident (Waterman, 1997). Promoting personal development envisions the student, through making a useful contribution to the project, having the perception of higher levels of skills and competencies contributing to the desired outcomes (Waterman, 1997). Benefits of civic responsibility are developed when individual and collective action is recognized as making a difference in the quality of

civic life, while believing this will lead to sustained involvement in community service by the students (Waterman, 1997). Although not educational outcomes, community benefits are integral to service-learning. The previous three categories would not likely be achieved without a resulting contribution to the community from the students' efforts (Waterman, 1997).

The goals of service-learning tend to be quite lofty, so evaluation and reflection of the activity is an important component. At a comprehensive level, service-learning evaluation can focus on both the students and the communities served (Jacoby and Associates, 1996). Such evaluation can be thought of in five main categories that are found in *The Research Agenda for Combining Service and Learning in the 1990's* (Giles, Porter Honnet, and Migliore, 1991):

1. The Participant
2. The Educational Institution
3. The Community
4. Theoretical Bases
5. Program Models

When using the five evaluation categories, *The Research Agenda for Combining Service and Learning in the 1990's* proposes that each one has a specific question to be answered. Focusing on the participant, the evaluation should answer the question: "What are the general effects of the service-learning experience on the individual student?". The educational institution evaluation answers "What is the effect of service-learning on the

improvement of the educational system and on specific types of educational institutions?”. The focus of the community evaluation is “What is the effect of service-learning on community improvement?”. When evaluating the theoretical bases, answering the question “What can service-learning research contribute to the development of theories that can further undergird and illuminate service-learning?” is important. Evaluating program models will answer “What are the components and outcomes of various models of service-learning?”.

Enos and Troppe (1996) suggest that evaluation is generally on student learning about an issue, reflection on the cognitive and developmental aspects of the experience and linking the experience with academic content rather than on substantial community outcomes. This focus on evaluating the student outcomes is tricky because of the lack of standardized instruments and the variety of settings in which the service-learning activity takes place. *The Research Agenda for Combining Service and Learning in the 1990's* recommends a subset of questions to answer the five specific category questions. The subset for the participant category includes (Giles, Porter Honnet, and Migliore, 1991):

1. What is the effect of service-learning on students as learners?
2. What knowledge do students gain as a result of service-learning?
3. Does participation in service-learning affect the participant’s perception of self and others, prosocial attitudes and behaviors, and view of the world?
4. What is the effect of service-learning on participants as citizens?

By answering these questions, an assessment of how service-learning fosters individual learning and development can be made (Jacoby, 1996). However, deciding upon the evaluation category and formulating the questions you want answered must then turn to the merits of the various evaluation strategies that are available (Bradley, 1997). When evaluating the student participant, Bradley (1997) suggests the use of surveys, self-reflective tools and observation as types of “user friendly” strategies. Self-reflective tools should include a variety of instruments, such as written questionnaires and journals, and discussion focus groups and interviews (Eyler and Giles, 1999).

Summary

Planners have long recognized the importance of public participation in the planning process and this has led to an interest in the concept of PPGIS. This introduction of GIS tools to community organizations for furthering participation has also had the benefit of empowering communities through access to the technology. The act of giving community access to the technology can follow several models, but the university-community model is particularly interesting because of the service aspect possibilities for students. By allowing students to transfer their “expert” knowledge of GIS to the community, the students are gaining educational value as residents gain tools that are intended to empower.

The university-community model of PPGIS also corresponds nicely with the concept of community-based research (CBR). CBR emphasizes recognizing the

community as a research partner and using a bottom-up approach to project development by involving them in all phases. In a service-learning environment, the partnership would benefit everyone with the community gaining empowerment, ownership, and needed assistance, while the university furthers the education of the student.

The service-learning model is a widely used approach to enhancing student education through applying classroom ideas to “real-world” projects. Assessing the value of a service-learning project through an evaluation strategy is difficult, but recommended. A variety of assessments can be done, but evaluating student outcomes is crucial to continuous improvement of the process. A variety of instruments exist, as well as recommended questions to be answered, to accurately and reliably evaluate student outcomes. The following chapter (Chapter 3) will provide a background on the specific project under study and Chapter 4 will provide details about how assessments were developed and conducted for this project.

Chapter III

The WUN MAP Project

The purpose of this chapter is to give an overview of the classroom-based PPGIS project that was evaluated for student outcomes. The project, named WUN MAP for the West University Neighbors Mapping Project, took place in the fall term of 2004 at the University of Oregon.¹ WUN MAP was developed based on service-learning principles, and provided an opportunity for students to gain experience working on a project meant to empower a local neighborhood group. At the same time, the project needed to provide educational benefits for the students enrolled in the class *PPPM 4/536: Applied GIS and Social Planning* at the University of Oregon. This class is offered to upper-level undergraduate and graduate students and strives to strengthen the GIS skills of students, while investigating how those skills could be used in a social planning context. The WUN MAP project offered a real world opportunity to utilize those skills and showcase the concepts taught in the class, particularly that of Public Participation GIS (PPGIS) and Community Based Research (CBR).

The Initial Spark

The WUN MAP project was born from two key events that took place almost simultaneously during the spring of 2004. The first event was the chair of the West

¹ Additional information can be found by visiting www.uoregon.edu/~wunmap/

University Neighbors (WUN), a city sanctioned neighborhood association, contacting the University of Oregon seeking assistance in visualizing the neighborhood in some way. The request sought to create a means of increasing involvement in the neighborhood, improving the neighborhood for residents, and at the same time making use of the vast resources at the university. Eventually, the WUN chair was placed in contact with Marc Schlossberg, an Assistant Professor in the Department of Planning, Public Policy and Management (PPPM), whose interests include social planning and empowerment.

The second event was Professor Schlossberg being awarded a small classroom technology grant. The grant, intended to bring new technologies into the classroom, would allow for the creation of new teaching tools around mobile GIS technology through the use of personal digital assistants (PDA). Professor Schlossberg intended to use the new technology during the Applied GIS and Social Planning class, preferably through working with a local neighborhood group. The timing of the two events propelled Professor Schlossberg to present the idea of a community mapping project to the WUN group.

During the presentation to the WUN group, three keys points were reiterated by Professor Schlossberg:

1. Control over the basic structure and content of the project would be in the hands of neighborhood residents. The effort would be based on the neighborhood inviting the class to participate.
2. As a class-based exercise, the educational value to the students was essential.

3. The project should be viewed as an opportunity to establish positive university-community interactions where each could derive benefit from the project.

After a month of deliberation, the neighborhood decided to invite the class into the neighborhood and jointly develop a plan of action.

The Planning of WUN MAP

Over the summer of 2004, Professor Schlossberg and I, the teaching assistant for the Applied GIS and Social Planning class, met on multiple occasions with two members of the WUN group. The meetings focused on formulating some guiding principles for the project and the final three were as follows:

1. The project should be of immediate value to the neighborhood.
2. The project should be small enough in scope to ensure success at the end.
3. The students must be able to gain tangible skills.

The guiding principles were brought back to a meeting of the WUN group and it was agreed to use them to develop the project.

The development and planning of the project happened over the course of regular monthly WUN meetings. Through discussions, the appropriate structure of what the project would entail was finalized. It was decided that one weekend day, preferably a Saturday, would be dedicated to bringing the students and volunteer residents together to utilize the PDA's for collecting data around the neighborhood. Of primary importance to the data collection day would be that the residents chose what data was to be collected.

After taking into account the size and layout of the neighborhood, the amount of time that would be available for collecting, and the amount of students that were enrolled in the class, the neighborhood decided on mapping the location of three key assets.

1. Public street trees - the neighborhood was interested in knowing where the trees in the public right of way are, as well as some basic facts about them. Their interest in street trees stems from their desire to protect trees in their neighborhood. The primary attribute of interest, therefore, was tree diameter because trees greater than eight inches in diameter have a different and stronger legal status.
2. Street lights - the neighborhood has a spatially unequal distribution of street lights, which can have impacts on safety. Equally of interest, the neighborhood wanted to identify where "traditional" or old-fashioned pedestrian-oriented and styled street lights were. Once residents know where these community assets are clustered, they can begin thinking about strategies to use them for additional community building activities.
3. Visible dumpsters - in addition to detached residential housing, the neighborhood has many multi-unit apartment buildings and some businesses that utilize dumpsters for their garbage collection. In some instances, these dumpsters are highly visible from any walking path, detracting from the viewshed throughout the neighborhood. Moreover, the dumpsters are often misused, further impacting the "feel" of the community.

The final steps were to publicize the data collection day event and to develop the data collection instrument using ArcPad, a mobile GIS software program.² The data collection instrument was created and included each key asset and the appropriate attributes for which the neighborhood requested information. At this point the neighborhood was also divided into 12 sections of equal size to ensure that all data could be collected in an appropriate timeframe by the student/resident teams. The process of

² ArcPad is created and distributed by Environmental Systems Research Institute

creating and using the data instrument was then developed into an in-class lab exercise for students to learn and develop the new skills and understanding of the mobile GIS technology. The exercise required the students to recreate the data collection instrument with all of the appropriate attribute categories and collect “practice” data from an aerial photograph on a computer. This allowed for the hands on experience, or a test run, to familiarize them with the data collection instrument before participating in the data collection day. Students were expected to both quickly learn the software and PDA-based GIS system and to be prepared to transfer that knowledge to the neighborhood volunteers at the data collection day.

Data Collection Day

The data collection day took place on October 16, 2004 and began with a 9am meeting of all participants at a neighborhood coffee shop. The meeting commenced with introductions, an overview of the day, a short questionnaire, and then moved onto the instructions on using the data collection instruments. The instructions were demonstrated to the neighborhood volunteers by the student teammate assigned to the section that the resident chose to work within. This time was also utilized to plot the most efficient strategy for collecting all of the data in the allotted time.

Total participation for the day included twelve students, eight neighborhood volunteers, Professor Schlossberg, and the teaching assistant (me). Since there were not enough neighborhood volunteers to pair with every student, I decided to collect the data

on one of the sections to provide the opportunity for two students to pair up with a neighborhood volunteer for the experience. Additionally, one student was obligated to leave early so she volunteered to collect the data on her own. In the end, nine students worked with a neighborhood volunteer in collecting the data, while three worked alone. Professor Schlossberg documented the day by riding his bicycle around the neighborhood taking pictures and also answering any questions the teams had about the instruments or process.

The instrument used to collect the location of the data also varied amongst the teams. The small grant awarded to Professor Schlossberg allowed for the purchase of six PDA's that were available for data collection. This meant that six of the teams would be using paper maps and pencils to collect the location of the street trees, dumpsters, and street lights. Prior to the data collection day, six students volunteered to use the paper maps and pencils. In the end, seven students and five neighborhood volunteers used the PDA's, while five students and three neighborhood volunteers used the paper maps.

The first phase of the data collection activity took place from 10am to noon. A break for a pizza lunch donated by a neighborhood pizzeria lasted from noon to 1pm and the teams returned to their sections to complete the data collection activities. All teams were finished by 3pm at which time each participant was given a questionnaire to reflect upon the process and to be returned to me as a participant evaluator of the project.

The final step to completing the data collection day took place during the following week in the classroom. The six sections that used the paper maps needed to be

transferred to the digital database created from the six sections using the mobile GIS technology. The students divided the paper maps amongst themselves and used ArcPad and the data collection forms to input the information into the database. Upon completion, the students could then use the collected data to visualize the patterns of the street lights, street trees, and dumpsters around the neighborhood.

The Final Product

The final phase of the project included several students creating maps that represented the data in various ways. One student created a map template that was used to coordinate the layout of all maps to be the same. In the end, approximately 80 maps were given to the WUN group using a consistent and cartographically pleasing format. The raw data was also given to them in two forms. One was in a tabular format using Microsoft Excel, and the other was a spatial format in the form of a GIS shapefile. The students, along with Professor Schlossberg, also attended one of the monthly neighborhood meetings to present the maps and discuss the success of the project. All data and background information were also uploaded to a project website.

Summary

The WUN MAP project was a collaborative effort between the West University Neighbors and the students of *PPPM 4/536: Applied GIS and Social Planning*. This service-learning activity was an opportunity to help increase involvement in and empower a local neighborhood group, while at the same time providing a hands-on

educational experience for the students. The students were presented the opportunity to gain tangible GIS skills through learning to use mobile GIS software and to transfer that knowledge to the neighborhood residents. They were also involved in collecting data with the residents about three key assets the neighborhood group had identified as important and later presenting the data to the group in a useable format. By allowing the neighborhood to control the basic structure and content of the project, the students could build upon readings and discussions about the concepts of PPGIS and CBR through a real world experience.

Chapter IV

Methodology

This research was structured to evaluate the outcomes for student participants in a classroom-based PPGIS project. The evaluation, like the project itself, was based on service-learning principles and utilized appropriate instruments for data collection. Six different instruments of data collection, based on methods recommended by Bradley (1997), were employed.³ The six instruments (pre-project questionnaire, post-project questionnaire, focus group, outcome survey, one-on-one interview, and participant observation) produced information pertaining to student expectations, learning, and recommendations. These multiple instruments were used to help ensure a reliable and accurate assessment of the project.

To acquire the most useful information from the six instruments of data collection, an appropriate structure to the research questions was essential. The structure, found in *The Research Agenda for Combining Service and Learning in the 1990s* (Giles, Porter Honnet, and Migliore, 1991, pp. 9-11), includes five categories of research questions about the effects of service-learning.⁴ The five categories are the participant, the educational institution, the community, theoretical bases, and program models. This research study only focuses on “the participant” because of the desire to understand what

³ Refer to Chapter 2 for a discussion of recommended methods

⁴ Refer to Chapter 2 for a discussion of the five categories and the questions to be answered

the general effect of the applied experience was the individual students. Within the participant category, four general question types are recommended for a thorough understanding of effect:

- What is the effect of service-learning on students as learners?
- What knowledge do students gain as a result of service-learning?
- Does participation in service-learning affect the participant's perception of self and others, prosocial attitudes and behaviors, and view of the world?
- What is the effect of service-learning on participants as citizens?

These four types served as the basis for formulating the specific questions and discussion items in the six instruments.

Pre-Project Questionnaire

The pre-project questionnaire was distributed to the 12 student participants the morning of the data collection day.⁵ The students were given approximately 15 minutes to complete and return the questionnaire, which all 12 did, before leaving to take part in the field collection activity. The questionnaire intended to gauge the student expectations and feelings about participating in the project. It also provided a means to formulate questions about satisfaction with the project later in the data collection process.

⁵ A copy of the pre-project questionnaire is included in Appendix A

Post-Project Questionnaire

The post-project questionnaire was distributed to the 12 student participants upon the completion of the field collection activity.⁶ The students took the questionnaire home with them and all 12 returned them during class the following week. The questionnaire was formulated to induce reflection, a critical part of service-learning, from the students on their participation in the project. Topics for reflection included working as a team or individually, the tool that was used to collect the data, and on the experience itself. The information from this reflection activity, partnered with the pre-project questionnaire, helped form the basis for additional data collection activities.

Focus Group

To build upon the information gleaned from the questionnaires, a focus group was organized and conducted on February 1, 2005; approximately one and one half months after the class ended. The strength of the focus group is the give and take of group discussion that occurs between participants. Simply listening as people share and compare points of view can obtain a wealth of information, a characteristic that you do not encounter during reflection exercises or interviews.

To ensure project organizers would not influence the discussions, I enlisted the help of two neutral, experienced facilitators to lead the focus group. One facilitator directs a well-established service-learning program and commands a breadth of

⁶ A copy of the post-project questionnaire is included in Appendix B

knowledge on the subject. The second facilitator manages multiple GIS projects simultaneously and has a background and personal interest in PPGIS.

Invitations were then sent by email to 10 students (the remaining two had graduated and moved out of state) asking for their participation. The invitations included a matrix that asked the students for their availability during the week of January 31, 2005 to February 4, 2005. A comparison of available times for the 10 students and two facilitators netted the final date and time when the greatest number of students, five, could attend. The five participants included one undergraduate Planning, Public Policy and Management (PPPM) student, one graduate Geography student, and three graduate Community and Regional Planning (CRP) students.

The focus group met in a conference room furnished with a table that allowed the participants and facilitators to sit in a circle, which helped to encourage interaction. The session lasted one and one half hours and was recorded with the signed permission of all participants; additionally, the researcher was present acting as a neutral observer, note taker, and later transcriber of the recording.

The session opened with a facilitator leading introductions, reviewing the agenda, stating the purpose, setting the ground rules, and reiterating the role of the researcher as an observer. The facilitators then turned to creating a dialogue amongst the participants, based on the open-ended questions that were formulated before the session.⁷ The discussions covered a wide range of topics, from the educational benefits of the project to

⁷ A copy of the focus group agenda and open-ended questions is included in Appendix C

suggestions for improvement, and the full participation by all students created a lively and energetic dialogue. The work of the facilitators was efficient at keeping the conversations within the bounds of the study, but at the same time exploring specific issues that were brought up by the participants.

Inherently, the structure of a focus group is ideal for this exploration and follow-up of key points made by participants and expanded the amount of useful information collected for this research. The information from the group interactions and dialogue, although not as easily analyzed as quantitative data, was very beneficial in formulating the structure of the final two data gathering instruments.

Student Outcomes Survey

After analyzing the information from the previous data collection efforts, a survey was generated based on that analysis and the four questions to be answered within the participant category of service-learning effects. The survey consisted of 18 statements and used a Likert-scale that included possible answers of *Strongly agree*, *Agree*, *Neutral*, *Disagree*, and *Strongly Disagree* to gauge the level of agreement from participants about the personal outcomes gained from the project.⁸ The statements ranged in content from gaining new GIS skills to learning from the community members.

The survey was distributed by email attachment to all 12 student participants and they were given two days to respond before a follow-up email was sent as a reminder.

⁸ A copy of the survey is included in Appendix D

Non-respondents were then sent a personal email reminder with the survey attached after an additional three days. This method of communication with the respondents resulted in 9 of 12 surveys being returned. The returned surveys were received from one undergraduate PPPM student, one undergraduate Geography student, one graduate Geography student, and six graduate CRP students.

One-on-One Interview

The purpose of the one-on-one interview instrument was to provide an additional means of reflection for the student participants and to build upon key themes identified in the focus group session.⁹ This approach allowed for more in-depth discussion about the personal outcomes for each participant. Also, conducting the interviews three and one half months after the end of the class permitted the students to have stepped away, completed another term of coursework, and had time to think about the experience. The intent of this timeframe was to challenge the students to reflect upon the long term impacts on thinking over the short term accomplishments of the data collection day.

Students were contacted by email to request their participation in the interview, as well as to explain the purpose, length, and the proposed topics of discussion. The topics for discussion were to focus on student outcomes and what worked well or did not work well during the process. Eight students responded with interest to participate in a 20 to

⁹ Refer to Chapter 5 for a discussion on key themes

30 minute face-to-face interview. The participants included one undergraduate PPPM student, one graduate Geography student, and six graduate CRP students.

The structure of the interviews remained consistent for all participants, but as with the focus group, the instrument allowed for the flexibility to discuss other topics the participant felt were important. I allowed the student to dictate the order in which the topics were discussed, but directed the student to touch upon each topic and had several questions available to stimulate the discussion for each.¹⁰ All interviews gleaned thoughtful and focused reflection from the students, as well as supplying quality information for the research of student outcomes from the project.

Participant Observation

The final instrument of data collection was implemented during the entire length of the project. I was involved in all phases of the project, from planning to implementation to evaluation, and acted as a participant observer during the process. This constant connection with the project allowed me to observe student interactions, reactions, and to have candid conversations about their involvement in the project.

The amount of time for observing was extraordinary, but six particular instances provided the primary means of participant observation. They included: the lab exercise teaching the mobile GIS program that would be used to collect the field data with the neighborhood residents, classroom discussions based on PPGIS and community based

¹⁰ A copy of the questions is included in Appendix E

research and their connection to the project, the data collection day, neighborhood association meetings, the focus group session, and the one-on-one interviews. The common theme amongst the six instances, outside of the one-on-one interviews, was interaction. This interaction, whether being between students or with neighborhood residents, provided the richest observation opportunities for me and provided an insight into student outcomes that would otherwise have gone unrecorded.

Summary

The purpose of this research was to evaluate a classroom-based PPGIS project to assess the outcomes for the 12 student participants. Six different instruments of data collection (pre-project questionnaire, post-project questionnaire, focus group, outcome survey, one-on-one interview, and participant observation), based on service-learning principles, were utilized. The benefit of employing the multiple instruments was the acquisition of a diversity of information from the students at various points during the research. The information from one data collection instrument could then be used to help develop consequent instruments, which helped to ensure a reliable and accurate assessment of the project.

Chapter V

Findings

This chapter will present the information gathered with the six data collection instruments. The key themes that emerged from the findings of each instrument will be highlighted, followed by a summary of the results of student outcomes in a classroom-based PPGIS project.

Pre-Project Questionnaire

The pre-project questionnaire served two primary purposes for this research. First, it represented an exercise for the twelve students to think about their participation in the project and the desired outcomes. Secondly, it provided an instrument to gauge student expectations. Four questions were asked of the students that afforded them the opportunity to think about their participation. The four questions follow with the key themes that emerged from the responses.¹¹

What are your expectations for the day from an educational standpoint?

- Skill building experience (data collection, ArcPad, PDA)
- Share skills and interact with the community members
- Experience the value of public participation/collaborative process for students and residents

¹¹ A copy of all pre-project questionnaire results is included in Appendix F

What are your ideas where this project could lead?

- Facilitating greater communication and developing a relationship between the university and the neighborhood
- Informed, active, and increased community involvement in planning
- Additional projects, within and outside of WUN, of possible bigger scope and classroom-based
- Community change through the empowerment of the residents from participating in the project

What are your feelings in participating with the community?

- Important to build relationships with and include the community
- Excited, it gives context and value to student work through real world experience
- Enjoyable to transfer knowledge/skills to benefit those outside of the university

How do you feel about being placed as a representative of the University?

- Good, because of the intent behind the project
- Preference to be viewed as a community member, not as a separate university authority

The questionnaire also afforded students the opportunity to indicate their opinion on the level of importance for knowing about the three community assets to be mapped. Eight of the students (5 very important, 3 somewhat important) felt knowing about street lights was important, while four were neutral. Ten students felt knowing about street trees was very important (4) or somewhat important (6), while two were neutral and eight students felt knowing about dumpsters/recycling was very important (5) or somewhat

important (3), while four were neutral. None of the three assets received a student opinion of being not important to know about.

Post-Project Questionnaire

The post-project questionnaire was designed to elicit student reflection on participating in the project. They were asked to reflect on two questions about the structure of the project and one question on the overall experience. The three questions follow with the key themes that emerged from the responses.¹²

What are some reflections on working as a team or individually?

- The three students who worked individually reported feeling lonesome and wishing for some interaction and feedback
- Working with a community partner was a good experience and made the process more efficient
- Working with a community partner gave a good sense of the challenges of collaboration and the need to compromise

What are some reflections on the tool you used to collect data?

- Found the PDA efficient for the project and easy to use
- Paper maps seemed to work fine, but knowing that the additional step of data input was to follow reinforced the benefits of the PDA

Overall, what are your reflections on this experience?

- All twelve students reported a fun and positive experience
- The experience was educational in taking what was learned in class and applying it with the community

¹² A copy of all post-project questionnaire results is included in Appendix G

- Sparked interest in other applications of the PDA and software

Focus Group

The focus group was conducted to promote small group discussion among five student participants about their experience. The subject matter for the open-ended questions was based on the key themes from the pre-project and post-project questionnaires, such as skill building, community interaction, and community empowerment. This encouraged the students to reflect upon personal and project goals, the concepts of PPGIS and CBR, as well as educational benefits and suggestions for improving the project. The responses helped to better understand whether student outcomes were aligned with their expectations.¹³

Discussions began around the goals of the project and personal learning goals the students hoped to achieve. The participants agreed that there was some uncertainty to the reasoning behind the data that was collected, but that building a relationship and trust between the neighborhood and university was understood. This led to a discussion about the importance of that goal of building trust and the students expressed concern over the time constraint that existed in a ten-week class. They felt the time constraint limited interaction with the community, which was unfortunate for trying to empower the residents. Questioned about the scope of the project in relation to the class, all students agreed that the project was appropriate, skill and time wise, and was a proper way to

¹³ A copy of the focus group transcript is included in Appendix H

reinforce classroom concepts. Consensus was reached that although the goal of building the relationship and trust may not have been met, a significant step had been taken and the educational value of understanding the difficulty in developing that relationship could be seen.

When asked further about the project as a teaching tool several positive responses were emitted: the hands-on experience of doing a GIS project with the community, learning ArcPad in a real-world setting, and the benefits of experiencing the views of the community. One student expressed that if it was just about learning the technology then it may not have been the best approach, but the project was inherently about working with the community. Again, concerns over the time constraints were expressed and the limited interaction that was required with the community.

The students debated whether this project qualified as PPGIS, but they did agree that the idea of the classroom-based PPGIS project should not be abandoned and some improvements could be made. More pre-planning involving the class would have helped clarify the intentions of the community for collecting the data and increased reciprocity would have enhanced learning from the community members and in teaching the community GIS skills. There was uncertainty whether the community gained any GIS skills, but the students could clearly see how GIS could be of benefit to the residents.

The reflection discussion turned to the data collection and the inconsistencies the students felt existed between collection teams. It was noted that although the information about the assets may not be consistent, the data is now at their disposal which is

empowering in itself. Students felt the data inconsistencies could be corrected with a little more preparation and it was not a result of involving community members. They also expressed their satisfaction with seeing the excitement from the community members in participating in the process and seeing the maps that were created and given to them.

When prompted to make suggestions for improvement the primary response was increasing the interaction with the community. One idea was inviting the community into the classroom to help analyze the data and provide guidance on what they would like to see on maps. Another was requiring all students to attend a neighborhood association meeting to help better understand the process of developing a project of this scope. The need for a more compelling data collection topic was also suggested, but one student pointed out that this was structured as CBR and providing a service to the community, while allowing them to make decisions for themselves.

The previous response moved the discussion to whether the service-learning exercise was empowering to the student. Students commented on the enthusiasm of some residents that made them really feel like they were providing a beneficial service and that was nice affirmation of their time. Creating maps for the residents also made the students really think about what data to show and how to best display it, which was a great learning experience in itself.

In the end, key themes that were synthesized from the focus group discussion:

- The project was an appropriate tool for teaching ArcPad, the concepts from the class, and learning to interact with the community
- Students did not agree on whether the project was an example of PPGIS, but agreed that the idea of a classroom-based PPGIS project should not be abandoned
- The goal of building a relationship and trust with the community was difficult because of time constraints, but it was a positive step forward.
- Increased interaction with the community and improved reciprocity were suggestions for improvement to the learning experience
- Public participation did not compromise data quality, but more preparation would have made the students feel the data was more useful
- Students viewed the service-learning experience as empowering to them and an action towards empowering the community

Student Outcomes Survey

The student outcomes survey was developed from the findings of the three previous data collection instruments and utilized the four general question types recommended to understand the effects of service-learning on participants. It was the only reflection tool that provided quantitative data in the findings. This data demonstrates the overall satisfaction that the nine students expressed with the project through this reflection exercise.¹⁴

What is the effect of service-learning on students as learners?

There were a number of statements that could have been employed to assess the effect on students as learners, but the statements that were developed from previous

¹⁴ A copy of the student outcome survey results can be found in Appendix I

findings are found in Table 1. When asked about the project encouraging the students to think about using GIS in different ways, eight students either strongly agreed (3) or agreed (5) with the statement with one student responding neutral.

Table 1. Effect On Students As Learners Statements

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The WUN Map project encouraged me to think about using GIS in different ways	3	5	1	0	0
The WUN Map project enhanced the learning experience of the class	5	3	1	0	0
The WUN Map project allowed me to learn from the community	2	4	2	1	0
The WUN Map project added value to the class through real world experience	4	3	1	1	0
The WUN Map project detracted from the learning experience of the class	0	1	1	3	4

Seven students strongly agreed (4) or agreed (3) that the project added value to the class, with one student responding neutral and one disagreeing with the statement. The statement looking for responses on the project allowing the student to learn from the community saw four students agree, two strongly agree, two responding neutral and one disagreeing. The final two statements inquired about the project either enhancing or detracting from the class and served as a data quality check. Eight students strongly agreed (5) or agreed (3) that the project enhanced the learning experience of the class with one student neutral. Seven students strongly disagreed (4) or disagreed (3) that the

project detracted from the learning experience of the class, with one responding neutral and one agreeing.

What knowledge do students gain as a result of service-learning?

The statements used to gauge student knowledge gained from participating in the project are found in Table 2. Eight of the students strongly agreed (5) or agreed (3) that the project helped to build new GIS skills with one responding neutral, while eight students also strongly agreed (3) or agreed (5) that good overall GIS skills were gained in the class with one neutral. All respondents agreed (5 strongly agreed, 4 agreed) with the statement that a new tool was introduced that could be useful in their future careers.

Table 2. Knowledge Students Gain Statements

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The WUN Map project helped me to build new GIS skills	5	3	1	0	0
The WUN Map project was adequately placed into context through classroom lectures/discussions on PPGIS	2	4	2	1	0
The WUN Map project introduced a tool that could be useful in my future career	5	4	0	0	0
I gained good overall GIS skills in the class	3	5	1	0	0

Six students strongly agreed (2) or agreed (4) that the project was adequately placed into context through classroom lectures and discussions, while two students responded neutral and one disagreed.

Does participation in service-learning affect the participant's perception of self and others, prosocial attitudes and behaviors, and view of the world?

Five statements, found in Table 3, were used to glean reflection on the project affecting student perception, attitude, behavior, and view of the world. Seven students strongly agreed (1) or agreed (6) that the project allowed for the fair exchange of expertise with others, one responded neutral and one strongly disagreed with the statement. Seven students also strongly agreed (3) or agreed (4) the project improved their view of the value of public participation with one neutral response and one respondent disagreeing.

Table 3. Perception, Attitude, Behaviors and View Statements

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The WUN Map project allowed for the fair exchange of expertise with others	1	6	1	0	1
In reflection, I feel like I participated in a project that was important	2	4	2	1	0
The WUN Map project improved my view on the value of public participation	3	4	1	1	0
In reflection, I feel like I participated in a project that will help to empower the community	2	4	2	0	1
Participating in a project similar to WUN Map would be beneficial to students in future classes	5	3	1	0	0

When responding to feeling like they participated in a project that will help to empower the community, six students strongly agreed (2) or agreed (4) with two neutral responses

and one strongly disagree response. Six students strongly agreed (2) or agreed (4) that they participated in a project that was important with two neutral and one disagreeing. However, eight respondents strongly agreed (5) or agreed (3) a similar project would be beneficial to future classes, with one responding neutral.

What is the effect of service-learning on participants as citizens?

The statements used to answer the question on the effect on participants as citizens are found in Table 4. Seven respondents strongly agreed (3) or agreed (4) they would be more inclined to use GIS for community involvement in the future, with two neutral responses.

Table 4. Effect On Participants As Citizens Statements

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
After participating in WUN Map, I am more inclined to use GIS for involving communities in the future	3	4	2	0	0
In reflection, my participation will encourage me to be involved in community projects in the future (with or without GIS)	2	4	2	1	0
I plan on using GIS in my future professional work	7	1	1	0	0
I plan on working closely with others who will be using GIS in my future professional work	5	2	1	0	1

Six students strongly agreed (2) or agreed (4) that participation in the project will encourage involvement in community projects in the future, with one student disagreeing

and two responding neutral. Eight students plan on working with GIS in future professional careers, while seven plan on working closely with others who will be using GIS.

Key findings from the student outcomes survey:

- The project had a positive effect on students as learners
- Students gained knowledge from participating in the project, particularly GIS skills and a new tool
- The project improved views on public participation and students feel a similar project would be beneficial to future students
- Participation demonstrated the worth of GIS in involving communities and students will become involved in future community projects, with or without GIS

One-on-One Interviews

The interviews built upon the key findings from the focus group discussion and allowed the eight student participants to reflect individually upon their experience. The participants discussed the project and what they felt worked well or what could have enhanced their learning experience. The interview findings are introduced according to the topics covered and then the key findings from the data collection instrument are presented.¹⁵

¹⁵ A copy of the one-on-one interview results can be found in Appendix J

Within the community mapping project, discuss what you feel worked well for your educational experience in an intermediate level GIS class?

Participants expressed satisfaction with the opportunity to build communication skills outside of the university, which included explaining GIS to the residents. This real world application of learning the software and applying those skills worked well for learning through action, not just reading. One student commented, “The community involvement aspect, listening to the needs of the community, was a good complement to the planning program”. Another responded, “One of the better, more memorable classes that I have taken”.

How about the introduction to ArcPad and field collection?

Students spoke on the benefits of learning ArcPad and the new skill set it provided them. It was also reiterated that the way it was taught, through the hands-on experience of field collection, was a valuable learning experience. Above new skills, the introduction to available tools was just as beneficial to some students. One student commented, “I liked the introduction to the tools that are available for use”.

How about working with the neighborhood in a real world setting?

Participants again reflected on the benefits of a real-world project over learning GIS in the classroom. They viewed the project as a team effort that allowed for positive interaction and exchange of ideas, while working towards the goal of helping the neighborhood address their needs. The students saw the value in introducing the tool of

GIS to the community and helping to create a relationship between the university and community that could lead to future projects.

What about the concepts of PPGIS and CBR?

Student responses indicated the project was a good effort at connecting theory and practice. The project provided insight into how to engage the community with GIS and involve residents in the project planning that otherwise would have been missed. One student commented, “The project helped me gain real life experience that I could reflect upon and then compare to the learning in classroom, which was different. Afterward, I could see the connection between them”.

How about the exposure to complexities in organizing a project?

The need to account for numerous variables when designing the project was evident to the student participants, as well as the need for training in the data collection process. Those who attended neighborhood meetings expressed the added benefit of witnessing the “cynic factor” of those opposed to the project and the work needed to compromise and accommodate.

What about the real time problem solving aspects while collecting data?

Students again commented on understanding the complexities in planning for the project and the need to adequately account for numerous variables. They also noted the benefits of experiencing the need to track time, communicate with the residents, and efficiently plan the data collection strategy, which will be useful if working on such a project in the future.

Within the community mapping project, discuss what could have enhanced your educational experience in an intermediate level GIS class?

Student responses netted three primary concerns of more time, increased interaction, and more involvement in the planning. Participants spoke of wishing for more community interaction (before, during, and after data collection day) that would have enhanced the learning experience, particularly for the three students who collected data on their own. Being involved in the planning of the project would have allowed for more interaction and exposed the students to the intricacies of developing a PPGIS/CBR project. They also expressed the feeling of needing more time to fully appreciate the project, which could also increase the interaction. A suggestion for spreading the project over a series of classes was made, as well as more involvement by all students in working with the data

Was it structured enough?

One of the suggestions for improving the structure was to require all students to attend a community meeting, as those who did found it beneficial to their understanding of the project. Other students commented on the fact that they felt the structure was loose and efforts were not concentrated, such as students being able to drop off after the data collection and a lack of follow up on important points and concepts throughout the process.

Need more direction?

The primary concern from the students was the feeling of not understanding the reasoning behind why the neighborhood chose to collect data on the particular assets. They felt having a better understanding would have made the data collection day more meaningful. Participants also thought more collaboration, with other students and the community, when working with the data would have been beneficial to the learning experience. Additionally, one student suggested an improvement of, “Better articulation of goals and objectives that demonstrate the purpose of the project and a way to evaluate successes and failures”.

Need more community interaction?

Participant responses indicated that more interaction with the community was wanted and could have improved the project. More required meetings, from pre-data collection day to a collaborative analysis of the data, would have benefited the students from their perspective. They felt getting to know the neighborhood’s residents better would have helped to understand the community goals and more interaction would have produced a greater exchange of GIS knowledge and ideas. A suggestion of requiring attendance at a neighborhood association meeting was again made, as well as some disappointment was expressed in the limited number of community participants.

Need more pre-planning involving class?

Responses were overwhelmingly in favor of including the students in the planning process of the project. Participants acknowledged the need for more time for this to be

realistic and the intention of allowing the community to drive the process, but felt a better understanding of the project could have occurred. One student commented, “Attending neighborhood association meetings gave a view into to the process, but we missed the creating and massaging of the project, which is important if you wish to do this in the future”.

Need more tangible outcomes?

Students responded that a PDA for each data collection team would have increased the learning experience for those who did not use one. This could have also increased the technology transfer to the community, maybe enhanced by some workshops, and gave the students more satisfaction in meeting the goals of PPGIS. Some disappointment in the data, quality and content, was also expressed in that it detracted from student interest in the project. Project management skills were expressed as an outcome that could be targeted in a project of this nature.

The one-on-one interviews provided quality reflection and added reliable data to the research. Key findings from the data collection instrument are:

- Students expressed satisfaction with the project, but wished for increased time and interaction with community members
- The real-world application of ArcPad was a good way to learn the tool
- The project connected well with the concepts learned in the classroom
- Students understood the complexities in accounting for numerous variables in the data collection, but were disappointed with the lack of involvement with the community in the planning process

- Attending community meetings was beneficial to the understanding of the project and should have been required
- More PDAs, a better understanding of community goals, and increased community participation would have helped student learning and stimulated their interest

Participant Observation

Throughout the project and associated research, several opportunities arose for observation of the student participants to gauge their outcomes. This included students interacting amongst themselves, with community members participating in the project, and attendees of the neighborhood association meetings. A rich amount of information was acquired and provided an interesting insight into student outcomes.

Students appeared genuinely interested in working with the community and showed great enthusiasm for the project. Many times the students talked of the need for more classes to apply structured service-learning efforts. One student commented, “I am a hands-on learner, so this project is a perfect fit for me.” Also, during discussions on PPGIS and CBR, the students grasped the concepts quickly and expressed excitement for testing the models in a real-world setting.

The introduction to ArcPad and the use of the PDA for data collection was another important aspect of the class to many students. There was a sense of disappointment that not everyone was going to use a PDA, but the students were willing to compromise and participate with a sense of purpose.

After the data collection, there was concern about inconsistencies with the data and they were well founded. However, students reminded one another that the project was bigger than creating a product for the community. It was about inclusion and empowerment, which the students embraced throughout.

Attendance at neighborhood meetings was not required, but students who did experience the interactions expressed that they developed a better sense of the project. Observing these meetings and the student attendees, I saw the benefits for the students as they were able to witness what it entailed to develop, plan, and implement the project with some resistance from certain community members. I believe it really reiterated the challenges of promoting public participation and having to collaborate and compromise with differing ideas and opinions.

On numerous occasions, wanting more community interaction and wishing that the project was over a longer period of time was expressed. Many students suggested meeting with the community before the data collection day to learn who, what and why of the project, as well as inviting the community into the class to create maps was also suggested. The ideas seem beneficial to the students and I believe the community members would have been more than happy to participate in these activities.

Some key findings from the participant observation:

- Students were enthused and positive about the project
- Attending a neighborhood meeting added value to the experience

- The interaction between the community and students was fun and productive, but could have been increased to promote more communication and knowledge transfer
- Some students struggled to keep an eye on the bigger goals of the project and not get caught up in technocratic precision concerns

Summary

The six data collection instruments gleaned a rich assortment of findings from the student participants. It provided information on their expectations, reflections on what the project meant to them, what skills they acquired and concepts they learned, as well as providing suggestions for improving a classroom-based PPGIS project.

Student expectations included building skills that could be shared with the community members through their interactions in a meaningful public participation project. They also hoped to develop a relationship between the university and community that could lead to additional projects, empowerment of the residents, increased involvement, and community change.

Their reflections showed that they viewed the project to be an appropriate method to teach mobile GIS technology (ArcPad) and the concepts of PPGIS and CBR. Students also expressed their enthusiasm for the project and the benefits of interacting with the community in a real-world setting on their learning experience. Some students did however convey concerns that time constraints and limited interaction hindered achieving the goals of empowering the community and of building a relationship between the university and community.

The time constraints and limited interaction were suggestions for improving the project and increasing the educational value for the students. More meetings between the participants and community, particularly before the data collection day, would have clarified the community goals for the students. Students also expressed that being involved in the planning of the project could have provided additional educational benefits that were missed. The following chapter will present an analysis of the findings and what they mean to classroom-based PPGIS projects, as well as make recommendations for improving the process to enhance student outcomes and add value to the larger theoretical concepts.

Chapter VI

Analysis and Recommendations

The purpose of this research was to evaluate student outcomes from participating in a classroom-based public participation GIS (PPGIS) project. The project was meant to teach the student participants of *PPPM 4/536: Applied GIS and Social Planning* new GIS skills and give them a real world introduction to the concepts of PPGIS and community-based research (CBR). The relevance of these concepts to the class can be found in the literature, which identifies them as useful to increasing community participation, building relationships, and empowering residents in decision-making processes.

The project, which had students using GIS in partnership with the community to collect data and analyze it, was based on service-learning principles. These principles also influenced the six data collection tools (pre-project questionnaire, post-project questionnaire, focus group, student outcomes survey, one-on-one interview, participant observation) that were employed to collect student reflections about the project and to evaluate the student outcomes. The findings from the research were presented in Chapter 5 as key themes for each data collection tool and in this chapter are condensed into four primary findings that were identified from the evaluation of student outcomes.

The remainder of this chapter will present the four primary findings from the analysis, including a short discussion about each, and then turn to how these primary findings relate to the student expectations that were gleaned from the pre-project

questionnaire. Following will be recommendations for future classroom-based PPGIS projects and what the research means for the larger theoretical concepts that were taught in the class.

Analysis of Findings

An analysis of the key themes that arose in Chapter 5 produced four primary findings from the student outcome reflections.

1. The classroom-based PPGIS project provided a positive learning environment that the students felt was worthwhile to their educational experience.
2. The classroom-based PPGIS project was of appropriate structure to learn ArcPad and practice the concepts of PPGIS and CBR.
3. The classroom-based PPGIS project could have had more of an impact on student learning by increasing interaction with the community, more participation in the planning process, and a greater transfer of knowledge to the community.
4. The classroom-based PPGIS project was restricted by time in meeting the goals of community empowerment and building a relationship with the community, but the value of working towards those longer-term goals was understood and evident in the student reflections.

The classroom-based PPGIS project provided a positive learning environment that the students felt was worthwhile to their educational experience. The opportunities to interact, communicate, and share ideas and knowledge was an important component of the project for the students. Very few opportunities exist in a classroom setting for the students to work on a real world project, particularly involving personal, hands on interaction with a community group. This experience of learning and using a new

technology, for not only student benefit but also for the community, was empowering for the students and helped to create a sense of purpose for their work.

The classroom-based PPGIS project was of appropriate structure to learn ArcPad and practice the concepts of PPGIS and CBR. The inherent purpose of the software is to collect field data, so the hands-on aspect of learning it was very beneficial to understanding the worth and utility of the tool. Participating in the project also allowed the classroom concepts to be better understood through implementation. Student participants were able to witness and make connections between the readings and the project. It provided the opportunity to experience the importance of planning, collaborating and compromising when developing and implementing a public participation endeavor.

The classroom-based PPGIS project could have had more of an impact on student learning by increasing interaction with the community, more participation in the planning process, and a greater transfer of knowledge to the community. The opportunity to develop a more defined partnership and a better understanding of the community goals and wishes was missed by the lack of student involvement in the planning process. More involvement could have also developed knowledge for formulating such a project in the future. Increased interaction between students and community members could have also helped to enhance communication, collaboration, and analytical skills. These skills, along with a greater sense of reciprocity from transferring GIS knowledge to the

community, were lacking and could have been improved through participation in a few additional activities involving the community and students.

The classroom-based PPPGIS project was restricted by time in meeting the goals of community empowerment and building a relationship with the community, but the value of working towards those longer-term goals was understood and evident in the student reflections. The student participants were truly interested in achieving the goals of PPGIS and CBR, as evidenced by suggestions for developing a project over multiple ten-week classes to experience the community outcomes. This lack of success was discouraging to the students, but the ability to stand back and reflect on taking a step towards meeting those longer-term goals allowed the students to appreciate their efforts and envision the worth of a classroom-based PPGIS project.

At this point, comparing the four primary findings with the student expectations will provide a more comprehensive picture of the value of the project. One of the strengths of the research methodology was the distribution of a pre-project questionnaire that allowed for the gathering of student expectations. Through this data collection tool, a baseline could be created to compare participant reflections about their perceived outcomes from the project. This comparison can help to determine whether participating in a classroom-based PPGIS project met student educational and personal goals.

When students were asked, “*What are your expectations for the day from an educational standpoint?*” three key themes emerged. The expectations were to gain skill-building experience, to share skills and interact with the community members, and

to experience the value of public participation/collaborative process for students and residents. The key findings suggest that all three of these expectations were met at varying degrees. The students gained tangible skills, while the inherent nature of the project was to interact with the community in a participatory environment. Increased interaction and a greater transfer of knowledge could have helped to better solidify these expectations.

When students were asked, “*What are your ideas where this project could lead?*” the longer-term goals of building relationships and empowering the residents were the key themes that emerged. These expectations were not completely met by the project, but the key findings suggest that the students were able to experience and value the contributions that were made in working towards those longer-term goals. These outcomes provided the students a view into the positive attributes of the concepts of PPGIS and CBR.

When students were asked, “*What are your feelings in participating with the community?*” they responded with it is important to build relationships with and include the community, it gives context and value to student work through real world experience, and it is enjoyable to transfer knowledge/skills to benefit those outside of the university. The key findings suggest that these expectations were met as the students found the project a positive learning experience, as they were able to experience all of the listed processes. Again, improvements could have been made, but the introduction to the expectations was valuable to the participants.

The four primary findings show that the student participants expressed their appreciation for the opportunity to take part in the project and the outcomes from that participation were beneficial to their learning experience. Their expectations for the project were met, except for the longer-term goals that would require additional time to realize. The students also felt the project could have been improved and made suggestions that would have enhanced the understanding and educational experience working with a community in a classroom-based PPGIS project. With this in mind, the following recommendations are offered to improve student outcomes in future classroom-based PPGIS projects and what these projects could mean for future research focusing on the concepts of PPGIS and CBR.

Project Recommendations

Project Continuation

The creation and implementation of classroom-based PPGIS projects should be continued in the future, while considering the recommendations below. Students have limited opportunities to participate in a service-learning endeavor where they can practice concepts and utilize skills learned in the classroom. This real world application of knowledge, hands-on experience, and communication that takes place provides numerous educational benefits for the students. Additionally, understanding what it takes to work towards the larger goals of community empowerment, building relationships, and

increasing participation in the decision-making process is difficult to achieve without directly participating in such a project.

Increased Interaction

Future classroom-based PPGIS projects need to include more required activities and meetings for the students to interact with the community members. The expectations of student participants and the benefits to student learning are directly tied to the communication and collaboration with the community. Participation in goal setting sessions, conducting GIS workshops for the community, working together in analyzing data, and attending neighborhood association meetings are a few examples of activities that could be required to increase interaction.

Project Expansion

Future projects should include a more collaborative effort between the students and community members in the planning phase. The fundamental characteristic of including the community as research partners is critical, but more interaction during this process will help the students to better understand the community goals. The students will also gain knowledge on how to efficiently create a similar effort in the future. This would be very advantageous for the professionals of the future and advancing the concepts taught in the classroom. Additionally, stretching the project over a longer time period would help to allow the students to further develop and witness the relationship between the residents and university grow, while providing additional opportunities for improving the transfer of GIS knowledge to the community.

Research Recommendations

Model Development

Future research on the benefits of PPGIS should concentrate on developing a model that could be followed in creating and implementing a classroom-based PPGIS project. Students should be a significant part of PPGIS and a model to encourage increased participation would be beneficial to the concept. Project development models have been proven to be useful in the past for many fields of study and would transfer nicely to achieve success in classroom-based PPGIS projects. The model would need to demonstrate the steps taken in the process of formulating successful projects. Topics such as developing goals, planning GIS activities and reflection exercises, and providing a recommended set of evaluation criteria and strategies would be beneficial to the efforts of future organizers. The model would not need to be very detailed, as each project will inevitably be somewhat different, but having a loose blueprint to help understand the process could be beneficial to encouraging more classroom-based PPGIS projects and also ensuring their success.

University Community Partnerships

University researchers and curriculum developers should undertake efforts to incorporate classroom-based PPGIS projects (or similar service-learning efforts) into educational programs. The value of real world experience would be beneficial to all students, but particularly planning students studying public participation techniques and

GIS students who are looking for alternative ways to utilize GIS for the improvement of communities.

Developing partnerships for continual promotion of projects, through resource and time allocation, would be the first step for implementation. The responsibility for this endeavor should not fall solely on an individual professor or researcher, however. Professors, in particular, are generally hesitant to take on such projects because of the reward structures in place at many universities. The university, as a research institution, is vital to promoting these partnerships and needs to develop campus wide policies that reward professors and researchers for implementing service-learning projects in a classroom setting. Prior research has demonstrated the benefits to a community from such project efforts and this research has shown the educational benefits to student participants, which should be the priority of a university. A shift in the current paradigm of the university reward system needs to take place for the development of partnerships that encourage the improvement of communities, students, and the educational institution.

Further Study

Additional research should continually be performed when new classroom-based PPGIS projects are developed and implemented. With a model for evaluation and partnership in place, new research should concentrate on student outcomes, community empowerment, public participation, and relationship building. This additional information will contribute to the knowledge base and help develop new and improved

techniques for ensuring the success of project efforts for both students and the communities. University efforts to develop partnerships and encourage project undertakings will be validated through this research.

Conclusion

Public participation is an important component of the planning process and numerous techniques have been used to increase participation. Recently, the concepts of PPGIS and CBR have become of interest to the planning profession for this reason and research on these topics has been undertaken. Evaluations of such projects have historically focused on outcomes for the community, but when using service-learning principles in a university community partnership, it is also important to understand the effect on student participants.

This research found that student participation in a classroom-based PPGIS project had a positive impact on their learning experience and tangible skills were gained in the process. Students were able to make connections between the theory and concepts taught in the classroom and the efforts that were undertaken in the project. With some minor structural changes to such a project, the benefits for student outcomes could be improved. The continued advancement of these concepts and contributions to the knowledge base can be encouraged through similar projects that provide benefits to all parties involved.

Appendix A: Pre-Project Student Questionnaire

1. Are you a member of the West University Neighborhood Association?

_____yes _____no

2. Do you rent or own your place of living?

_____own _____rent

3. Do you feel a part of the neighborhood you live in?

_____yes _____no

If no, how important is it for you to feel a part of your local neighborhood?

- Very important
 Somewhat important
 Not really important
 Not important at all

4. In the following table, a series of categories are presented down the left hand side. To the right of each category, please put a check in the box that most reflects how you relate to a neighborhood.

	<i>Very Important</i>	<i>Somewhat Important</i>	<i>Neutral</i>	<i>Not Important</i>
Physical condition of the neighborhood				
Overall sense of community				
Your personal social connections in the neighborhood				
Renters and owners are equally valued				
The relationship between the University of Oregon and the neighborhood				

5. Have you ever been involved in a neighborhood or community planning activity?

_____yes _____no

6. Have you ever used a personal digital assistant (e.g. a Palm Pilot)?

_____yes _____no

If no, are you interested in learning the basics? _____yes _____no

7. What are your expectations for the day from an educational standpoint?

8. What are your ideas where this project could lead?

9. What are your feelings in participating with the community?

10. How do you feel about being placed as a representative of the university?

11. Today we will be collecting data on street lights, street trees, and dumpsters/recycling. How important is it to know about these community assets?

	<i>Very Important</i>	<i>Somewhat Important</i>	<i>Neutral</i>	<i>Not Important</i>
Street lights				
Street trees				
Dumpsters/Recycling				

Thank you for taking the time to fill out this survey! Please look at the optional questions on the next page and turn in your survey.

Would you be interested in talking one on one or in a focus group about your experience with this mapping project?

_____yes _____no

If yes,

Your name: _____

Your phone #: _____

Your e-mail: _____

(This page will be separated from the rest of the survey so that your survey answers remain anonymous.)

Appendix B: Post-Project Student Questionnaire

Were you part of a team or collecting data individually?

What are some reflections on working as a team or individually?

Did you use a PDA or paper maps/forms to collect data?

What are some reflections on the tool you used to collect data?

Overall, what are your reflections on this experience?

Please return to Darren Wyss by email, US mail, or just hand them to me.
dwyss@uoregon.edu
128 Hendricks, 1209 University of Oregon
Eugene, OR 97403

Appendix C: Focus Group Agenda and Questions

1. Welcome and introductions
2. Agenda for today
3. Reason for focus group
 - a. Part of broader study
 - b. Focused mostly on your learning, as opposed to the effects within the community
 - c. Looking specifically at the WUN project, not the entire class
4. Ground rules
 - a. Stay on track
 - b. Full participation
 - c. Candid and open
5. Roles
 - a. Darren is observing and taking notes
 - b. Recording the session with signed permissions

Questions for focus group

- 1) How effective was the WUN project as a teaching tool?
 What do you feel were the goals of the project in relation to the class and how well were those goals met?
 Did the project meet its goals?
 Did the project relate to other topics covered in class?
 Overall, what are your thoughts on the experience of participating in the project?
 Was it a good experience?
 What could have improved it?
 What worked well in the project?
 What are the benefits/pitfalls of using this project as a teaching tool?
 Was the project appropriate for this class?
 Size, time, skill level
- 2) Educational value of the WUN MAP Project
 What impact did the project have on you?
 Was this expected or surprising?
 How did the experience impact views of GIS?
 How did it impact views of community work/planning?

Is a similar project something that you would consider to utilize as a future participation tool in your career?

What skills, if any, did the project help you acquire?

Are these skills that can be beneficial in the future?

Additional benefits of participating beyond working with GIS?

3) Impact of WUN MAP project on the neighborhood

What value did they gain from project above receiving maps?

What do you feel were the goals for the neighborhood?

Did the project meet the goals?

Was the project well received by neighborhood?

Could this lead to continued relationship with University?

Do you see value for the neighborhood in continuing community mapping/GIS as a participation tool?

Appendix D: Student Outcomes Survey

Please check the box next to each of the 18 statements that best reflects how you feel about that statement. The responses will be used in the evaluation of the community mapping project (WUN Map) that was part of PPPM 4/536: Applied GIS and Social Planning. Upon completion, please either email it back to *dwys@uoregon.edu* or have it available during the one-on-one interview. Your responses will be confidential and only used in the evaluation of the community project. If you have any questions feel free to contact me. Thank you for your time.

	1 Strongly Agree	2 Agree	3 Neutral	4 Disagree	5 Strongly Disagree
1. The WUN Map project helped me to build new GIS skills					
2. The WUN Map project encouraged me to think about using GIS in different ways					
3. The WUN Map project allowed for the fair exchange of expertise with others					
4. After participating in WUN Map, I am more inclined to use GIS for involving communities in the future					
5. The WUN Map project enhanced the learning experience of the class					
6. In reflection, I feel like I participated in a project that was important					
7. The WUN Map project allowed me to learn from the community					
8. The WUN Map project improved my view on the value of public participation					
9. The WUN Map project was adequately placed into context through classroom lectures/discussions on PPGIS					

10. The WUN Map project introduced a tool that could be useful in my future career					
11. The WUN Map project added value to the class through real world experience					
12. In reflection, I feel like I participated in a project that will help to empower the community					
13. In reflection, my participation will encourage me to be involved in community projects in the future (with or without GIS)					
14. The WUN Map project detracted from the learning experience of the class					
15. Participating in a project similar to WUN Map would be beneficial to students in future classes					
16. I gained good overall GIS skills in the class					
17. I plan on using GIS in my future professional work					
18. I plan on working closely with others who will be using GIS in my future professional work					

Additionally, I am hoping to meet with you individually to discuss the following subjects related to the community mapping project. Please take some time to reflect on the project before meeting and our discussion should then only take 20 to 30 minutes. If you haven't already set up a time to meet with me, please email me at dwys@uoregon.edu to do so. Again, I really appreciate your time and effort for the evaluation of the project.

Within the community mapping project, what do you feel worked well for your educational experience in an intermediate level GIS class?

Within the community mapping project, what could have enhanced your educational experience in an intermediate level GIS class?

Appendix E: One-on-One Interview Template

Within the community mapping project, discuss what do you feel worked well for your educational experience in an intermediate level GIS class?

Introduction to arcpad and field collection

Working with the neighborhood in a real world setting

Concepts of PPGIS and CBR

Exposure to complexities in organizing a project

Real time problem solving while collecting data

Within the community mapping project, discuss what could have enhanced your educational experience in an intermediate level GIS class?

Was it structured enough?

Need more direction?

More community interaction?

More pre-planning involving class?

More tangible outcomes?

Appendix F: Pre-Project Student Questionnaire Results

5. Are you a member of the West University Neighborhood Association?

0 yes **12** no

6. Do you rent or own your place of living?

0 own **12** rent

7. Do you feel a part of the neighborhood you live in?

4 yes **8** no

If no, how important is it for you to feel a part of your local neighborhood?

2 Very important

4 Somewhat important

2 Not really important

0 Not important at all

8. In the following table, a series of categories are presented down the left hand side. To the right of each category, please put a check in the box that most reflects how you relate to a neighborhood.

	<i>Very Important</i>	<i>Somewhat Important</i>	<i>Neutral</i>	<i>Not Important</i>
Physical condition of the neighborhood	8	3	0	0
Overall sense of community	5	5	1	0
Your personal social connections in the neighborhood	1	6	4	0
Renters and owners are equally valued	3	3	5	0
The relationship between the University of Oregon and the neighborhood	2	3	4	2

5. Have you ever been involved in a neighborhood or community planning activity?

8 yes 4 no

6. Have you ever used a personal digital assistant (e.g. a Palm Pilot)?

7 yes 5 no

If no, are you interested in learning the basics? 5 yes 0 no

9. What are your expectations for the day from an educational standpoint?

Data collection experience and a chance to work with maps

Learning ArcPad in a real-world setting

Learn more about WUN through partners with residents for the day and share my skills with residents

Learn more knowledge from the residents and practice social GIS

To learn more on how to interact with the community

Learn about the collaborative process

Evaluate the effectiveness and usefulness of public participation in community planning

See how residents respond and value the experience

I expect to learn more about the neighborhood by walking in places I haven't been and learn about GIS and map making

See how physical characteristics of the neighborhood relate to condition

To learn how to do data collection in neighborhoods and how to go about doing it

PDA knowledge and mastery

10. What are your ideas where this project could lead?

Skills for a job

Removal of poor dumpsters/unsanitary conditions & increased street lights

Accurate data collection to show something previously unnoticed

Provide information on connecting physical space/objects with neighborhood feel

Map where bikes are stolen/project could be repeated every year to accumulate data

Hope residents get excited about potential of GIS in community planning & nurture a relationship w/the University

Hope that participation increases

Enhance relationship/communication b/w University and WUN

Visual representation of characteristics/make people more informed

Increase the University's trust of the community view

Applied by other professionals and neighborhood associations
 Projects w/bigger scope or in-depth study of a community
 Lead to greater communication b/w University and neighbors
 Definitely could lead to more classes like this
 More community feeling and pride in the WUN
 Web based interface to the collected data for reporting problems/changes
 Better integration of digital mapping for community involvement in planning

9. What are your feelings in participating with the community?

Neutral-it is not my community and wouldn't want to live there b/c of impacts from students
 Wonderful to help teach our skills to others and help ensure the university benefits those besides its students
 I like it. It gives context/value to your work as a student
 Feel excited to participate and practice GIS knowledge in the real world
 Feel this is a great opportunity
 It is important to include the community
 Most important part is building relationships
 Excited to meet the characters
 Excited, it feels good to do something for the community
 It is important to get their involvement
 Enjoy the fact that I can use GIS within my community

10. How do you feel about being placed as a representative of the university?

Not always the best rep
 I feel that I can accurately represent the university by being a student who is knowledgeable about this material
 Great, excited to share knowledge and make the connection
 I hadn't thought of it that way/figure everyone I meet is part of the university
 Fine, but prefer to be member of community and not separate university from neighborhood
 Feel good especially on behalf of the class and the intent behind it
 Feel that I can do the job
 University plays an important role in impact to neighborhood
 Feels good/don't want to be viewed as an overall authority but as someone in the university who is giving community based research a shot
 Honored/privileged
 Just fine/been a rep of other organizations and feel OK with it

12. Today we will be collecting data on street lights, street trees, and dumpsters/recycling. How important is it to know about these community assets?

	<i>Very Important</i>	<i>Somewhat Important</i>	<i>Neutral</i>	<i>Not Important</i>
Street lights	5	3	4	0
Street trees	4	6	2	0
Dumpsters/Recycling	5	3	4	0

Appendix G: Post-Project Student Questionnaire Results

Were you part of a team or collecting data individually?

9 Team **3** Individually

What are some reflections on working as a team or individually?

Rather lonely, boring and repetitive but learned a lot about data collection and how tedious and time consuming it is

I would like to have worked with someone for feedback and help. It would have been great if we were using the same technology and process

It wasn't as bad as I thought. The community member was very helpful and insightful as to the tree species/habitat, etc. It was an educational experience as well.

I thought we worked faster and it was nice to have company. We also checked each others decisions (quality control) about size, height, type, etc

Wish my partner was more interested in the PDA or GIS in general. Overall, I thought it went well but wish had been more productive

Working with community member has its challenges, a lot of compromising

By working as a team thought the process moved more quickly. For instance, I was often able to take measurements of a tree while partner oriented us on the map. I was able to scout out areas before walking there

Great/we had a great time combining our efforts

I worked quickly and efficiently but was somewhat lonesome

Having a second person made things easier as we split the duties of recording so we weren't constantly flipping sheets of paper. We also had extra eyes for spotting features and an extra brain for estimating values. We were a good check on each other. Having a partner likely didn't speed up the process but made it more accurate and interesting

Good reliability and a good fit

Working with a team had many positive aspects. First, it made the data collection easier and we double checked each other and strategize on the best way to collect the data and it broke up the monotony. Also became friends with my partner.

Did you use a PDA or paper maps/forms to collect data?

7 PDA **5** Paper maps

What are some reflections on the tool you used to collect data?

It was very easy to use though at times it was difficult to determine if my actual location matched the digital location. It was very fast, with a little glare. I think I discovered an option to make comments, and that's cool.

Great, easy to use and manage data

When I started to think about the people with paper forms having to type it all in.....definitely saves a lot of time

It seemed efficient b/c all data collection and orientation were done on same device

Quick and slow/orienting myself on screen took a great deal of time, however paper maps may have been worse PDA=good for data gathering/collection

Very user friendly/my partner had never used one and had no problem picking it up.

Camera was very cool record keeping tool

The paper forms were fine; I think my community member was a bit disappointed that we weren't using a PDA

Ideally it would have been perfect to have more people on each team so that you could do both, use PDA and write as there is value in both

It was easy but a PDA would have been better, especially for data entry and use in computers/ paper posed problems if it would have rained/windy

Overall, what are your reflections on this experience?

Good experience

It was interesting the process of taking what was learned and going out into the community was invaluable. Working w/the WUN made the project a reciprocal learning exercise. It will be interesting to see how they apply the info

Overall I think it was a positive experience. It got a bit old in the end, but the weather cooperated and everything was fine. In retrospect, I would have had my community member do some recording, instead he alerted me of the features we were looking for. At times I felt that we had different opinions as to size of tree, etc and I always deferred to his opinion.

It was fun to be outside collecting data with the community members. I'm at a neighborhood meeting right now and would never have been here otherwise.

Good real world experience with all random variables (weather, difficulties) Maybe if the info had more to do with our final projects and class labs I would have deemed the experience that much more important. Not to suggest that it wasn't important, but something more consequential to the neighborhood, but that is why I will do some sort of rideability for final project to gain a greater understanding

Great, I had a lot of fun

As both an interested student and community member I felt the activity was interesting. Being introduced to the PDA was valuable for my future interests in school and it was

interesting as a community member b/c I was able to look at my community thru a more critical eye. In fact, at one point I was so focused on measuring trees that I wandered into my own yard and unwittingly began doing measurements on my own trees.

Fantastic, I am already thinking of other uses of this technology. I might be using it for surveys of historic buildings.

Great experience

It was fun, pretty easy and I enjoyed getting to know my partner. My feet started to tire by hour 5 and my partner was visually slowing by hour 4. We finished right at 3pm, so the time estimation was right on.

Who at EWEB or public works may keep duplicate data on lighting locations?

I really enjoyed the experience. I would like to understand the PDA better because it seems it would have many other potential uses for community organizing. It would be very interesting to me what the neighborhood would use the tech for given more access and experience. Also I am very curious to know how the neighbors view the effectiveness and usefulness of GIS. Will they want to do more later?

Appendix H: Focus Group Results

- Facilitator: How effective was the WUN Map project as a teaching tool? What were the teaching goals?
- Student: Get as many students as possible interacting with the community, getting experience doing public policy with community members that is not completely structured, get the opportunity to get out of classroom and interact.
- Student: Marc really didn't want us to know the definition of the project, but wanted us thru this experience to figure it out so thru this experience I didn't know what the real purpose of the tasks were so it made me think of my own interests but when I found out the purpose of the project from community perspective it made me redirect focus of my final project.
- Facilitator: Sounds like goals for instructor perspective were not clearly laid out for you.
- Student: Yeah, he stated I want you to figure it out for yourself, so I knew he didn't want us to know what the real purpose was
- Student: From the community's perspective of why we were tracking the data?
- Student: Yeah, I didn't talk to individual people about why exactly are we looking at trees, so I didn't really know.
- Facilitator: Were goals of your learning and the project goals in line or two different things?
- Student: My understanding from beginning and why I was interested, don't know if it was explicit or not, but was to rebuild trust between the University and WUN because don't have the greatest relationship for a number of reasons. Doing GIS in SSIL for 8 hours a day is one thing, but to take that goal and bring it out is something that you can't possibly learn in a classroom. That dynamic b/w you as an expert in GIS and actually working with a community, there is only one way to learn and is by doing, so it was a valuable experience working with the people and sounds like it got the ball rolling, but I don't know if the goal was achieved or the learning experience was in right inline with the goals.

- Facilitator: Seems like they were kind of coming together for you, personal learning goal and the goal of doing community project.
- Student: I think so
- Student: I think it varied depending on how much you involved yourself in the project. Some people did their final project on mapping and going to meetings and I think doing that enhanced the project and learning experience, over just doing one day with the community and one day of mapping. So definitely a spectrum as far as how much time you spent.
- Facilitator: One point of interest is how that project relates to other parts of class, was there a clear relationship or did it seem out on its own?
- Student: First reaction would be yes, seemed like a neat project, a requirement unless you did it as your final project, but at the same time we received weekly updates so you were still kind of a part of it seeing other people's work.
- Student: If it was just a project about making maps and collecting data then participating with the community was a downfall, I don't think it made the process any better, we could have gone out and done it ourselves easier and more efficiently and put out probably better projects but the goal of building trust and empowering the community is a lot harder than making some maps and collecting some data and it takes a lot more time and like you said I only participated with the community a few days so I don't think we could achieve that far out goal, at least personally.
- Facilitator: Was this project in relation to the class appropriate for the time and scope. Was it doable or seem like way too much in hindsight. Was it a good project? Too long too short to big too small too lofty of goals?
- Student: I actually came away pretty happy with how the scopes matched and data collection took exactly the right time it was scheduled for or anticipated. We were able to get some product out to them at the end of the course in maps and that matched well. Generally tried to keep the goals interaction goals.
- Facilitator: What about the skill level...too high too low?

- Student: For the most part I think the project was appropriate for the class I think the other goal of improving trust between WUN/University is a lot to try and accomplish in 10 weeks if that sort of was the main goal.
- Student: I don't think that was the main goal, but a step towards that.
- Student: Yeah, as a step towards it, it would be nice if somehow to continue project with something else to reach goal
- Facilitator: Lets explore that a little further, do you think it moved it further and in the long term it will work and what the actual benefits were for WUN in terms of the relationship.
- Student: I think it just showed that building that relationship was not exactly easy b/c when we finished the final projects we went to meeting to reveal some of the WUN maps but I don't know where the project is at and I guess that I realized you can't just work with a community produce a product and have it be final right away and I guess it is difficult to see that relationship more than just the class
- Student: I know that Marc spent time over summer putting time in, and then not sure about continuing but I know he spent a lot of time on website so wow it would be great to have it spread over a couple of quarters, for one just the administrative organization of it. Kind of funny to go in for just six weeks once you chop the quarter down on beginning and end. Six weeks being involved in project and then just wash your hands of it. Just too short especially if you are looking at the long term goals of it
- Facilitator: Put the focus back on you, as a teaching tool, that experience you describe is it an effective teaching tool
- Student: I would like to mention that another teaching/learning goal was the hands on experience with mobile GIS application, so there were a number of teaching goals and various parts to them. I personally never used the mobile GIS but had some experience before so that goal personally wasn't important to me, but the goal of going out and getting a sense of what it is like to do a GIS project with the community, yeah I learned a lot and I also personally got some things by pushing myself to learn some technical things in ArcGIS that I wanted to learn but never had an excuse to do so I was able to work with the WUN map project and work with the data and create map templates. I set that goal for myself

- Facilitator: So let's make sure that we have all the learning goals that either you had or you felt like the instructor had: mobile GIS, technical skills, interacting with the community in this particular setting. Any other goals??
- Student: fun to get out and collect data
- Student: my personal goal was to improve my map making and the social part of the class was a plus, but my one goal was to just get the practice
- Student: I guess kind of the challenges of working with a client group, community/community based research I really felt reflecting on the experience that it was beneficial seeing the views of the community, collecting data with a community member was really interesting.
- Facilitator: So it was beneficial to you personally?
- Student: Yes
- Facilitator: So thinking of the WUN Map project and its benefits, like mobile GIS, did it need to be a community project for you to increase your skills?
- Student: I don't think it was necessarily the best way to learn the mobile GIS, but it may have been a good way b/c it was a real project. The community wanted something out of it, we were kind of out of that loop b/c we weren't all able to attend those meetings and ask what you wanted to get out of it. So no if my goal was to only learn the technology, but the project was inherently about working with the community.
- Facilitator: So it sounds like in terms of working with the community that this was an effective tool?
- Student: To an extent, b/c it was mentioned that the preliminary parts of it, the making of contacts all of that happened back in the spring, figuring out what the community wanted happened in the summer, so they knew there was a class coming getting meetings set up for that one day. We in class only had a little view into the mechanics of behind the scenes working with the community. We got one on one with individuals doing the project everyone in class got that and those who chose to continue by going to meetings, working with the data, but most people didn't see the behind the scene organizing and all of that.

- Student: I think it would have been a more enriching experience if I would have had that opportunity, but under the circumstances you sort of have to make choices whether you are going to study for an exam on the next day or attend a community meeting which would be more fun and more fulfilling. Where you are actually working on a project that is meaningful to people and their lives than doing some abstract thing that doesn't mean anything to anybody. So it would have been nicer that there would have been some compromise academically you know, ideally you would have been able to participate more fully for a longer period of time
- Facilitator: Thinking back would you use a project as an instructor thinking in terms of the students learning perspective? For example, GIS concepts.
- Student: I think it was effective, b/c I didn't really understand what attributes were since I never collected them, but you know exactly what you are thinking here, b/c usually you just download it and they are just there. But in that way it helped me understand how to organize data and what can go wrong, data organization can get complex, so that was something that I hadn't done before.
- Student: I think as a tool I would have learned just as much if I had taken the unit out on my own and decided to map the trees, but taking a community member out and helping them map trees from a learning standpoint may be better.
- Student: From a learning perspective, you have to have hands on aspect and as the previous student just said, you didn't need the community but definitely need the hands on.
- Student: From a personal learning perspective we did a re-creation of the table structure of the interface of the mobile unit prior to doing the data collection. So everybody had an idea of what was in the background and that didn't require a community based project, but I can see why he would choose to do that because it provided us a little more spark. He could say this is what we are going to be using on Saturday and it is not just an exercise, but he didn't do a good job of relating that, so in lecture he could have tied it together more, the lab and the overall aspect.
- Facilitator: So it was never clear why you were doing things?
- Student: Not as clear as it could've been.

- Facilitator: That would have helped in your learning?
- Student: I think so, gave me an understanding ahead of time.
- Facilitator: From a skill/concept wise view sounds like any project could have worked, but from a community project if any one aspect that influenced the learning was the reality of having the client or someone to work with to light a fire under your butt.
- Student: I know that I zone out on really technical things so knowing that we were going to go out separate from Marc with a community member it was essential that we knew ArcPad. It might depend on the person, but I remember thinking I don't want to mess up, it gave me motivation.
- Student: Trying to put myself in Marc's shoes and think about whether it was an effective teaching tool, for just the six weeks we worked on it I would say no, limitations outweighed the benefits even for Marc, I know he is not tenured and he doesn't get anything extra from trying to build trust with the community, he gets peace of mind. I think that it could be restructured and we shouldn't trash the idea and say the limitations are too much and the students don't get anything extra out of it, but I think the university is an incredible resource and there is a community surrounding the university who really needs a lot and I think it should be a goal of the university to try and break down some of those limitations and make it so we can learn and work on real projects. I think we can learn at least as much and maybe more, differently, and the community can benefit from this incredible resource here and that is my personal feeling.
- Student: I think when we did our individual projects Marc didn't just have WUN as an organization lined up to work with, he had several others I know students in the class worked with other organizations.
- Student: There were two others with data to work with.
- Student: Was there more opportunity in that one to do more working with the community group in establishing a relationship?
- Student: No, more of just Marc allowing us to focus on the project on our own and work with the data. He said he didn't want us "working" for the client thinking we had to produce a product. He wanted us to more figure out on our own what we wanted to show on maps.

- Facilitator: So one thing I think I am picking up from you is for most of the class there were some that were more engaged with the broader community but most were engaged in the WUN map with one individual.
- Student: I guess we didn't have the physical interaction, just very briefly.
- Student: We just had one day of mapping, almost everybody worked with somebody who was community member. Then some others went to meetings as observers, but that was optional.
- Facilitator: One of the teaching goals was to look at PPGIS as a tool. Do you feel like you got an understanding of how it can work and how it could work in other projects that you may work on, did you get a good understanding of it?
- Student: My understanding of PPGIS was a transfer or more of a reciprocal transfer of knowledge where the community gains some understanding of this abstract thing called GIS and hopefully we get some community knowledge. But not so sure how much. Maybe sparked an interest in the community, but I don't know that they said wow we could do some really cool things with this in the future. So I am not so sure how successful we were at transferring GIS knowledge to them aside from that. I don't know how much I got out, I guess one thing the knowledge that could have been taken back with me was how much the WUN was interested in solving their concerns such as vandalism and safety of neighborhood, and we think of GIS all the time and we could do this and do that, but change the direction and start thinking of real projects.
- Facilitator: Do you think you know what PPGIS is?
- Student: I think we had three or four readings on what PPGIS is and I imagine it as more of a reciprocal thing and a relationship where you are learning a lot more from the community, more of an exchange and I would agree that I don't think there was a lot of that.
- Student: I understand it as a partnership, usually an educational institution, it's not a neighborhood taking on GIS by itself b/c it doesn't have the resources, so it gets together with an institution or two organizations get together.

- Student: I don't know that this project was PPGIS, there could have been a way to partner or have continuous contact with people we worked with mapping and don't know what role we could've had, but maybe a back and forth and I think it would be a good example of PPGIS. It really wasn't but I think the person I worked with was the chair of WUN and talked with him in general terms of what GIS means and what they might be able to do with it and it seemed to spark a fire of what they could do to keep expanding on this project.
- Student: From what the WUN chair says, what they are going to do with the info it meets some of the definitions of PPGIS b/c he is planning on using the resources that we provided, especially in relation to his pet which is trees, to use the maps to provide evidence and arguments to the city when talking about removing street trees. So he is planning on using that and his goal for the neighborhood group is using the info to lobby the city.
- Facilitator: So many definitions of PPGIS, one is about empowering the community.
- Student: This was a start
- Student: I wonder how effective that would be though, I know the city already has that data about the WUN and the data we collected there were some problems because there were some communication issues, we weren't collecting data consistently, so the data weren't really that accurate. So from an argumentative point if he brings that into city council
- Student: The key is that he now has some info at his fingertips to balance out in some respect the info that the city has that he doesn't have access to.
- Student: I would think that the goal of the city would be to work with the neighborhood and I know that there are a lot of PPGIS projects where the city provides data to community members and technology. Not in Eugene, but other cities.
- Facilitator: There are two strains of PPGIS, collecting data for use and perception of where things exist in space.
- Student: I agree with the previous statement that it definitely is an opportunity for empowerment, something the community can take to city council and show the tree on the corner of 14th and Alder but not so sure about the quality.

- Facilitator: Sounds like the fact that they exist empowers them even if a final decision isn't made with that data. Do you think that since the community was involved that it affected the quality of the data?
- Student: I think a little more prep as a class as a whole would have been better instead of just the day of collection. People could have asked questions and get everything out in the open so you could get more solid data....a little more quality control. I don't think the community was an impediment to work with.
- Student: I know from my personal experience with my community member was that I wanted to make them feel involved and it influenced how the data was collected.
- Student: I agree
- Student: It was a good transfer of knowledge from class to field, for example attribute ranges like the size of trees, definitely real world experience.
- Student: You just needed to plow through them, couldn't change at that point without rescheduling.
- Student: Some photos of what was being described by the attributes would have been helpful, some sort of better explanation, better conception.
- Student: I have been around here for some years and it changed my perception of the neighborhood, walking around made me see and realize a different perspective and gave a good idea at looking at things from a different lens.
- Facilitator: What could have improved this learning experience?
- Student: Invite the community into the class for more interaction, just needed more time with them, preferably at our scheduled time and not in the evenings/weekends.
- Student: Grad students had worked on projects like CPW, so think they needed more ownership, but I feel that I learned a lot from the community.

- Student: Would be good to expand WUN data to something else, not enough level of participation. People could just drop off after collecting the data and spending one lab making a map of the data.
- Facilitator: Think of it in terms of the project fitting in with the class.
- Student: Could have been a more compelling topic, more options and more interesting if you are going to be spending more time on the project.
- Student: Felt that we needed a more structured goal, as Marc didn't want us acting like WUN was our client, but our partner. Could have had a better end product.
- Student: I still see the service learning view, not academic goals but participating with the community, could have had fewer assignments in order to fully engage. The expectations were beyond realism.
- Student: We needed to do the assignments not go to meetings.
- Student: Could have required a community meeting as an assignment.
- Facilitator: Think about the service aspect of service-learning, was it empowering to you?
- Student: I think the few opportunities to meet people, like the WUN chair, who were really into this project made me realize this is great that I am providing service and they are excited about it and that was a nice affirmation like them seeing the final maps and saying oh this is great so seeing that you did all this work and they appreciate it.
- Student: I entered the class not even sure about the social aspect in a GIS class, but I think I did learn a lot of good lessons making a map for the community and thinking about the readability of the maps from a personal goal.
- Student: A student talked about the day we entered data in the classroom and were asked to do something with it and I remember a lot of people were like what do you want me to do with it, nobody really had an idea of what to do with dumpsters and street lights, so that was a learning experience in itself forcing you to think about what could I do that was meaningful and it would have been nice to have community members there to instruct us

and say I want to see this. I think it would have enhanced the experience more and made it more meaningful.

Student: More hands on with the community; I don't know any members of the group that got any GIS skills.

Student: I think that one of the great parts of PPGIS is that it is not just exporting maps, here's a map and that is great, but you learn a lot from looking at the layers and by working with a client and creating a map. You learn a lot about the neighborhood and how different areas and different variables work and the community members will learn a lot from that process, but they didn't get any of that part of the GIS.

Student: The first part is defining community member b/c we are working with the board of the WUN and they have jobs, they volunteer to do this work, so we talk about working with the neighborhood, but we are not, we are working with the board.

Facilitator: How many community members were out?

Student: 10 to 12

Student: They actually weren't all from the community.

Student: The guy I worked with was from Cal Young, he thought it was a great idea and just wanted to check it out.

Facilitator: Thinking back about what you learned was there anything else about GIS or this project that you learned.

Student: I learned a ton, but b/c I didn't know much coming in.

Appendix I: Student Outcomes Survey Results

	1 Strongly Agree	2 Agree	3 Neutral	4 Disagree	5 Strongly Disagree
1. The WUN Map project helped me to build new GIS skills	5	3	1	0	0
2. The WUN Map project encouraged me to think about using GIS in different ways	3	5	1	0	0
3. The WUN Map project allowed for the fair exchange of expertise with others	1	6	1	0	1
4. After participating in WUN Map, I am more inclined to use GIS for involving communities in the future	3	4	2	0	0
5. The WUN Map project enhanced the learning experience of the class	5	3	1	0	0
6. In reflection, I feel like I participated in a project that was important	2	4	2	1	0
7. The WUN Map project allowed me to learn from the community	2	4	2	1	0
8. The WUN Map project improved my view on the value of public participation	3	4	1	1	0
9. The WUN Map project was adequately placed into context through classroom lectures/discussions on PPGIS	2	4	2	1	0
10. The WUN Map project introduced a tool that could be useful in my future career	5	4	0	0	0
11. The WUN Map project added value to the class through real world experience	4	3	1	1	0
12. In reflection, I feel like I participated in a project that will help to empower the community	2	4	2	0	1

13. In reflection, my participation will encourage me to be involved in community projects in the future (with or without GIS)	2	4	2	1	0
14. The WUN Map project detracted from the learning experience of the class	0	1	1	3	4
15. Participating in a project similar to WUN Map would be beneficial to students in future classes	5	3	1	0	0
16. I gained good overall GIS skills in the class	3	5	1	0	0
17. I plan on using GIS in my future professional work	7	1	1	0	0
18. I plan on working closely with others who will be using GIS in my future professional work	5	2	1	0	1

Appendix J: One-on-One Interview Results

Within the community mapping project, discuss what you feel worked well for your educational experience in an intermediate level GIS class?

The experience of creating the instrument and not just given it to take into the field and use was beneficial.

Presenting to the neighborhood association helped give a sense of completion.

Felt the benefits were in the real world experience. Seeing it in action and not just reading about it in class.

Really felt that working with others in the class on a real project was beneficial.

The conception of how GIS data is created was beneficial.

The community involvement aspect, listening to the needs of the community, was a good complement to the planning program. Felt the project was well directed.

The experience of working with folks outside of academia was great for learning to communicate ideas better, through explaining the uses of GIS and what it can/cannot do.

The communication with folks who are “out of the loop” was beneficial to my learning experience.

The work on representing the data was useful in creating a portfolio that helped me to get a job.

Saw the great potential for exchange of benefits with the community, such as learning for students and assets for the community.

The experience was worth it and the potential exists for improving the process by putting in the time and effort.

Liked the idea of the exchange of knowledge and software to build a foundation for collaboration.

One of the better, more memorable classes that I have taken.

How about the introduction to ArcPad and field collection?

I feel as though the most important skill I learned through the project was the use of ArcPad and the use of portable mapping software. This gave me a whole other skill set that has helped me in my GIS career.

Collecting the data gave a good comprehension of the digital representation of real space and gave a different perspective of the neighborhood.

Very helpful to learn ArcPad and to be made “experts” in the field

Nice to know how to use ArcPad, as it was a good introduction, but more useful if everyone could have used one in the field.

Liked the introduction to knowing what tools are out there for use.

The most beneficial way to learn ArcPad was to go out and use it. I am a hands on type of person.

I liked the real life setting of it because it sinks in better in the field.

The field collection showed how it was to be used properly.

The project led to more hands on experience in GIS and developing more skills.

ArcPad was relevant and useful, but could use a little more communication.

I had no prior knowledge about ArcPad or data collection so it definitely taught me a new skill.

How about working with the neighborhood in a real world setting?

The real-world experience, hands-on, has benefits over classroom exercises

Provided a sense of a team, meeting together then splitting off to collect data, then coming back together to discuss things.

I enjoyed the team building aspect of it. Learning GIS and sharing skills with others (we were not all experts, but helped one another to be efficient) was awesome.

Great experience working as a team that you don't get in the classroom and felt it was a valuable project for the residents.

Working with the neighborhood was definitely beneficial because of the interaction with a different mix of people that participated.

Made the project richer by helping a community by responding to their needs, and as a positive experience then it should be useful in the future.

Liked the goal of building trust between the university and neighborhood and the passing of knowledge about ArcPad and GIS to the neighbors.

Was cool to meet and interact with the residents.

Got to learn a lot about the neighborhood and met interesting people. Also have a new appreciation for street trees as it is easy to take them for granted and not notice them, but thanks to the WUN chair's infectious enthusiasm I now pay attention.

Enjoyed working with them, although it was not intellectual, and it could be a stepping-stone to possible future work and what could be accomplished.

Beneficial to see how the community viewed GIS and what it could do for them, was reciprocal in the sense of communicating with them the power of GIS.

What about the concepts of PPGIS and CBR?

Felt like the explanations of the project were OK, although didn't buy into helping the community with what was collected until afterwards when introduced to portion of the group who were skeptical about GIS and saw that it was a controversial issue

Saw the potential benefits of the software and how simple information can be represented on maps, which is powerful for taking just an afternoon of collection

The project gave a general sense of the uses of the concepts and what they could be useful for.

Felt like I learned different ways to interact and work together, while producing a better product.

Felt there was adequate preparation of the concepts for the project, but lost site of that goal when got into doing GIS. Maybe a little more discussion after the data collection. The interaction and project helped explain the concepts a bit more and it is something that I feel could be used in my future career.

Was able to see the divide between letting the public choose subjects vs. the researcher seeing things that should have been done, but that could have just been the limits of residents not understanding what could have taken place and the need to educate them- the ever important transfer of knowledge.

I felt the project was PPGIS and a good effort at making that connection between the university and neighborhood.

I hope that the maps will be used for useful projects, such as street light infill and dumpster beautification.

The concepts were really learned through the readings and classroom discussion, but I know GIS is a useful tool and will be more likely to use it in the future.

The project helped me gain real life experience that I could reflect on and compare the learning in classroom to that was different, to see the similarities between them.

The project really allowed me to see the tie between the theory and practice in the real world.

Got a good sense of using GIS as a tool to engage the community and really couldn't truly learn the concept of PPGIS without experiencing a real world project.

How about the exposure to complexities in organizing a project?

Gave a good sense of the need for training, which is a key to a successful project

The whole process was surprisingly quick: collection, synthesis, and cartography
Beneficial to attend meetings, because of the real world expectations or cynic factor, which shows how people can interpret actions out of context.

Attending neighborhood meetings made it tangible and not just a class project

Learning curve can be steep for a project like this, although just using the PDA was not so difficult.

Felt like there were three components: planning, collecting, and presenting. Participated in two of the three and felt that was sufficient. Although there is value in deciding what they want as well as when they see the information collected and formulate ideas based on that information.

Implementing the data day and organizing the data was a good experience.

Felt the process was understandable and clear, at least from my point of view.

Was able to conceive the minute details that limit what can/cannot be done. Accounting for all variables the project needed to be general in nature considering the circumstances. Saw how it really takes a lot of time and effort and the need to evaluate whether it is really worth it.

Need skeptics to keep the process real and going to a meeting was crucial in understanding the complexities.

What about the real time problem solving aspects while collecting data?

Discerning how to read the instrument and do the data collection was beneficial. Impressed with data day, how it was synthesized and presented to the neighborhood, and the timeline was fine.

Very helpful to see it in action because you had to track time to make sure you finished, while at the same time making adjustments to smoothly collect the data because of decisions that were missed in the classroom setup.

Participating in the collection was very useful to understanding the need for adequate planning of the process.

Showed the complexities of involving the community when they may not have the same level of knowledge or understanding.

The data collection day really reinforced the complexity in having to account for all variables for the information to be useful.

Good for the future as thru the experience was able to see what might work better in the future.

Experiencing the dynamic of working with the neighborhood was essential, but increased expectations about data quality could have increased people's interest.

Walking through the neighborhood gave me a different perspective when mapping it, noticed how many different things were around.

Within the community mapping project, discuss what could have enhanced your educational experience in an intermediate level GIS class?

The time issue was the biggest hindrance, as two terms to complete the project would have allowed for more student involvement in planning the project.

If you could go into the future and do the project, see how it works then go back of course it would be better but that is not a reality.

More interaction would have enhanced the experience: before, during and after data collection day....maybe a second weekend.

Requiring everyone to work with the data and discuss things would have been helpful.

Hard to pinpoint exactly what I got out of it because of the lack of interaction limited the learning experience from the angle I came at it.
Thought about course sequencing and how it would work better over a longer time frame.
I collected data on my own, so I missed the sense of what went on with the other teams.

Was it structured enough?

I didn't use WUN Map for my final project, which limited the experience, and by the end of the term the project didn't feel very meaningful to me. I didn't see the purpose in or the benefit of continuing to work on the project, so I chose to do a project that would benefit me more. If the project was perceived as being more beneficial to the community I may have worked on it.

Would be great if the course was a sequence of courses where one builds on the next.

Should have required students to go to a meeting, because it was very beneficial.

Felt the structure and information could have been better, such as important concepts and points reinforced throughout.

Should have required attending a meeting to get that aspect of the process.

If safety was the issue (street lights) then maybe concentrate efforts more, or street trees to protect them.

Understood why they chose to map things, but the structure and implementation seemed loose.

Need more direction?

Greater collaboration, cooperation with others in class. More like a group project. In hindsight the project seemed to end up being many people's individual projects.

Better articulation of goals and objectives that demonstrate the purpose of the project and a way to evaluate successes and failures.

After data collection, wished for more direction from neighbors in what they wanted to see.

Reasoning behind types of data collected was vague and could have been expressed in a more useful way as to why these assets were collected.

Initial direction was OK for my level of skill and knowledge, but maybe some more discussions on the concepts for some of the other folks.

It was hard to understand why the data collected was important to the neighbors.

Wished for more up front information as I felt not everything was communicated well.

Very vague reasoning behind why we collected data on what we did.

More community interaction?

Hoped for a greater exchange with community residents and more time dedicated to project

Limited participation by neighborhood in data day was disappointing.

It was good to see the interest of the few, but limitations on only dealing with a few of the many.

Presentation by the community on the why, who, what; just to get to know them a bit more.

Interaction with the WUN chair was beneficial and wish could have included him more into the classroom discussions/planning.

Community meetings seemed disruptive, but introduced to the element of “conspiracy” and distrust that is inherent in projects working with the public. I guess the “unintentional lesson” was beneficial.

The level of interaction was fine, but again wish that the project could be bigger and more detailed, spread out over a greater time period.

I didn’t go to any community meetings, but wish I could have and maybe it should have been required.

Really felt there was a need for more collaborative analysis, maybe the neighbors coming into class and getting their input into the maps would have made the ending more powerful and gave a better idea of ownership for them.

The goals of class/community interaction were limited by only one required meeting. Should have required a meeting beforehand to get to know the project.

Wanted to see more contact with community to express what GIS is capable of and what they wanted out of the project.

Really enjoyed the community meetings, but should require one before and after data collection day.

A meeting before the data collection day would have been helpful in having a dialogue about why things were being done and to understand a more comprehensive reason to do things.

More pre-planning involving class?

Would have been helpful, but just not enough time, maybe two classes?

More time involvement would have helped the process.

Felt I got a sense of the complexities in the organization of the project but didn’t fully appreciate them because not totally involved. So didn’t really learn anything about the pre-planning concepts.

Nice to have met the neighbors beforehand to get to know them, reiterate why we are collecting this data and a session to brainstorm ideas about standardizing the data collection process.

I think the planning would be what the students wanted to get out of the class.

I understood about 80% of the process, but not fully.

Definitely should have been more time for the class to learn about the project before the data collection day.

Gave a view into to the process through the neighborhood meetings, but missed the process of creating and massaging the project, which is important if you wish to do this in the future.

Didn't feel it was a collaborative group project because of missing the planning, which would have been better.

Could have been beneficial because not totally sold that the data was useful and could have been better served by appropriate consultation about what and how it was collected.

The idea was empowerment, giving the people power to make decisions and I feel like I understood that.

Would have been fun to allow the students to develop areas of the project for the experience.

More tangible outcomes?

Felt like it was only a portion of what we could have given them, maybe a workshop for the community to give them more tools and explaining what GIS can do for them as a lot of folks were excited about the tools. The data collected also could have been more meaningful.

Wish more work with ArcPad had taken place.

Lack of PDA's for everyone limited the experience and missed the merge of technology and interaction for all.

The technology transfer was limited and wish that could have been improved, but again the time issue comes into play. Length was a big issue.

Really wished to have increased the WUN technological capacity and skills to further acquire information in the future. It was missing.

More collaboration and working towards a goal, maybe an atlas.

Data limited interest in working further with it, but if I felt it was more beneficial to the WUN then maybe my mind would have been changed.

Project management skills would have been helpful, because it is great on a resume.

The lack of PDA's limited the learning of ArcPad.

Maybe finding a community that has identified a problem that they need a solution to would have been helpful, as felt as though the neighborhood scrambled to find something to map.

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