



## **Beyond Our Horizon: Reaching out to Engineering Faculty to Teach Spatial Literacy**

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## Abstract

The National Research Council of the National Academies has recognized the importance of spatial thinking as an important skill in the 21st century, and in its report “Learning to Think Spatially”, supports its integration in the K-12 curriculum. Building on universities’ increasingly recognized and integral support for Information Literacy, comes the realization that Spatial Literacy should be another of those skills that should be taught at the tertiary level. Recognizing the growing need for help with GIS support, the University Library set out to develop a structure for the support of Spatial Literacy on campus.

Engineering support in the library has traditionally remained firmly text based, supporting the academic side of Engineering research, but leaving much data development and practice in the domain of the laboratory. In fact, there has been little demand from instructors for library instruction in Engineering classes. In contrast to this trend, the Initiative for Spatial Literacy was launched by the libraries, by the hiring of an adjunct faculty member from the School of Engineering who spearheads the program, collaborating with the university’s Engineering Librarian. This article will explain what spatial literacy is, and will describe how the program was developed, and how it has grown and expanded to become a truly multi-disciplinary program on campus. We will argue that integrating GIS into the services offered by the library encourages students, particularly Engineering students, to participate in interdisciplinary and collaborative processes.

## Introduction

The major changes in academia which have been brought about by the increased use of technology in research and teaching have seen a corresponding change in libraries. With the ever-changing landscape of librarianship has come a significant increase in the types of services provided by libraries, and even in the way libraries operate. Some libraries still face the challenge of reforming their practices and programs in order to adapt to this new reality.

The Central University Libraries (CUL) has reacted appropriately to provide services and programs that are emerging to address the changing needs and demands of its patrons. Based on the current recognition that “all human action has a spatial footprint”, the use of GIS has been growing widely, and more and more libraries are offering services to serve their population that uses this technology.<sup>1</sup>

In 2014, CUL attempted to fill the position of Map Librarian because the incumbent was retiring. A decision was made to create a new position that would not only manage the Libraries’ extensive collection of traditional maps but would have an added role of GIS research support. The initial national search failed because the search committee could not find someone with the requisite skills and expertise to essentially take on two quite distinct sets of job duties. The

library administration decided to go back and rethink what it was that was truly needed to fill the existing vacancy and serve the university community.

#### Literature review

Different definitions abound as to what spatial literacy means.<sup>2</sup> Diana Sinton refers to it as the “competent and confident use of maps, mapping, and spatial thinking to address ideas, situations, and problems within daily life, society, and the world around us.”<sup>3</sup> Goodchild describes it as “a set of abilities related to working and reasoning in a spatial world and to making a picture truly worth a thousand words.”<sup>4</sup> The National Research Council (NRC), in its report “Learning to Think Spatially”, refers to spatial thinking as a “universal mode of thinking”, and has recognized it as an important skill in the 21<sup>st</sup> century, and further supports its integration in the K-12 curriculum.<sup>5</sup>

GIS has long been recognized as having a critical role in enhancing students’ spatial literacy and as an important tool not only in the study of Geography, but increasingly across multiple disciplines and learning contexts. In her dissertation, Kim references the ongoing debate over how to define the “S” in GIS (as either Systems, Studies, Science, or Service).<sup>6</sup> Several articles discuss the importance of integrating spatial literacy in post-graduate/doctoral programs, and Luna and Miles report on the introduction of GIS into the Civil Engineering curricula.<sup>7</sup> In their article, Luna et al. describe their project which was developed to teach students the use of GIS to “reinforce basic concepts taught throughout the curriculum in a comprehensive manner.”<sup>8</sup> Both he and Miles acknowledge the recognition of GIS as a beneficial technology in their field of Civil Engineering. Miles gives several case studies in which GIS has been used as a tool for modeling in Civil Engineering, but also cautions against the potential for misuse in its application.

The literature in librarianship is replete with articles discussing libraries’ shifting services and programs in response to clients’ demands, including that of providing GIS services.<sup>9</sup> Boisse describes the introduction of GIS in academic libraries as “a part of the analog-to-digital changes that have been occurring since approximately the late 1960s.”<sup>10</sup> Deckelbaum gives an overview of the concepts and concerns involved with having GIS in libraries.<sup>11</sup> Adler and Deckelbaum describe the challenges involved with regards to staffing needs, thoughts that go into choosing the right computer products and the type of service to be provided, based on the expertise of the staff and the financial or policy constraints at the institution.<sup>12</sup> Adler further observes that “no one service model has emerged; rather, each library has formulated strategies to meet local institutional needs.”<sup>13</sup> She goes on to describe the different types of GIS services that have been developed in various institutions. One of the incontrovertible points discussed in her work is the importance of establishing “partnerships within a community” for the “successful integration of GIS services in libraries.”<sup>14</sup> Kinikin reports on a survey that was done in Fall 2001 of 286 libraries to determine the degree to which smaller schools have adopted GIS and how the implementation was accomplished. She stated that the results of the survey showed that although some libraries showed an interest in GIS, they equally often revealed a lack of support for the service. According to the survey, only half of the libraries that were surveyed have staff devoted

to GIS, even part-time. She concludes by stating that "...GIS can be used as a marketing tool to get people into the library and using library resources."<sup>15</sup>

The library literature extensively covers the disciplinary differences in the library use or information-seeking behavior of students at the different levels.<sup>16</sup> The most widely-held conclusion has been that students in the Sciences and Engineering do not use the library or seek information in the same way as those in the Humanities or Social Sciences – "In other words, it is quite possible for science and engineering undergraduates to avoid the library, if not completely, at least until relatively late in their educational experience."<sup>17</sup> Moreover, numerous articles explore faculty's attitudes towards library instruction and why these attitudes may affect students' use or non-use of the library.<sup>18</sup> Many have written about how faculty have agreed on how important information literacy is, but how that acknowledgement of its importance has not translated into a "wider acceptance and adoption within higher education in general."<sup>19</sup> In reporting the results of their study, Leckie and Fullerton report that "... a high proportion of faculty have never made use of the library instructional services..." Another important observation they made was that "...faculty in science and engineering do not require extensive library research in their courses and thus do not see its importance."<sup>20</sup> The study further revealed that out of 46% of faculty who have expressed interest in a collaborative approach to teaching information literacy, "only about a third of faculty were interested in collaboratively designing assignments...or grading." Unlike undergraduate students in the Arts and Social Sciences, faculty in the Sciences and Engineering "were more likely to talk about appropriate reference tools and indexes in class" rather than "design assignments that required library usage."<sup>21</sup> A few have reported otherwise.<sup>22</sup> Bridges' study did not show any "statistical difference between the frequencies with which Engineering students visited the physical library when compared with other academic disciplines."<sup>23</sup>

Various studies have been done on the importance of librarian-faculty collaboration, and while most have shown that there are several instances of this type of collaboration in some institutions, others have concluded that this collaboration is not always deep.<sup>24</sup>

## Background

After the initial failed search for a Geospatial Information Librarian in 2014, the then-Dean of the Libraries convinced of the need for the library to support the demand for GIS services on campus and also recognizing the ongoing trend for libraries to be more responsive to the needs of its patrons, decided to try another approach.

She reached out to others on campus, including the Dean of Research and Graduate Studies. She wanted to get some input on the type of skills such a librarian should possess in order to provide the most beneficial services to faculty and students on campus, as this was a new direction for the library. Upon further discussion with faculty who were already teaching GIS and some library staff, the possibility emerged to frame the search differently. Rather than focusing on finding a librarian with the requisite skills to manage the library's map collection and also support technical GIS, the library could look into the option of bringing in someone from outside the library profession. The library was hoping to find someone with the specific specialized skill

sets of both GIS knowledge and the ability to lead the effort to create a new center to support the development of spatial literacy on campus. Recognizing the multidisciplinary nature of GIS and the need to support new modes of scholarly research, the library set out to identify someone who would be most suited for the job. Although some GIS was already being taught within various courses on campus (Anthropology, Engineering, History, Geography), these professors each worked quite independently and hardly knew each other. In several meetings across disciplines the name of an adjunct faculty in the School of Engineering came up several times as someone who, despite not being a librarian, might have the range of experiences to be a candidate for such a role.

The faculty member identified was a professional architect who had been recruited to teach Sustainability and Development in the School of Engineering on an adjunct basis and was also a doctoral candidate in Civil Engineering. She had also been teaching graduate-level GIS in the Engineering school. She was approached by the dean. In discussions between the two of them, a vision for the position was developed. Rather than describing the role as the manager of a technical support center, the dean took the opportunity to craft a direction for thinking about geographic data and spatial analysis as alternative directions for investigation and research. In this way, the library could set up a center similar to other research support centers which provides a platform for the introduction, growth and development of innovative ways of doing research using GIS. The position thus created was drawn up as a joint position shared between the School of Engineering and the Central Libraries. Consequently, the position, Director of the Initiative for Spatial Literacy, was from the start, integrated with the School of Engineering with the professor both teaching in Engineering and running the new program. Having made this decision, the library set out to develop a full structure for the support of spatial literacy on campus, and the Initiative for Spatial Literacy and Geospatial Research was launched.

The vision for the Initiative was that the support the library would give to students would not only be in providing a technical or visualization tool but also in introducing students to the educational process of mapping. The Initiative hoped to introduce the possibilities for using mapping and spatial processes as tools for thinking differently about the students' data, the context for their investigation or the way that they were uncovering the ideas for their research.

Although best known as a liberal arts institution, the university has a rapidly growing Engineering program. Engineering support in the library has not been as robust in terms of funds for collection development, when compared to other areas. Much of the library support has been for the academic side of engineering research, without much support in the areas of data or laboratory-related investigation. Prior to 2015, for about two years, there was no Engineering Librarian on staff and not much contact made with the School of Engineering. After the hiring of a new Engineering Librarian in 2015 she set out to engage faculty and create interest in the various library services offered including that of library instruction, but with little success. This was not entirely surprising; as already stated, several studies attest to the fact that Engineering students, particularly undergraduates, use the library less than students in other disciplines, and that faculty do not readily make use of library instructional services. In 2017, there were about 161 course-specific instruction sessions for various disciplines, none of which was for

Engineering. Outreach by the Engineering Librarian to the faculty for suggestions on types of workshops that would be beneficial to their students had similarly not been very successful, although an appreciable number of Engineering students signed up for various workshops offered by the libraries throughout the year. There have also been a few individual requests for one-on-one consultations, mostly with graduate students and a few undergraduates.

#### Program description and development

The program for Spatial Literacy was developed in incremental steps and has quickly grown and expanded to become a model for truly multi-disciplinary research support on campus.

The Director of the Initiative for Spatial Literacy came on board shortly after the Engineering Librarian was hired. According to the job description, the position was originally supposed to provide six specific areas of GIS support for the library: teaching support, research support, technical support, online access, interdisciplinary geo-spatial support and spatial data management. However, coming out of her research-based work in the School of Engineering, the director's approach to these six areas was, perhaps, somewhat more outwardly focused than it might otherwise have been. Her direction from the start was in first attempting to uncover and knit together existing users and user-groups, existing user skills and existing spatial interests and commonalities. The difference between what was originally described and how the approach was actually taken is of interest not only as a model for GIS practices in a library but for broader development of inter-disciplinary work across the library and university.

The position was initially developed to provide leadership in planning, developing and managing interdisciplinary GIS services, instruction, programs and collections. This was re-focused by the director to create priorities in three different areas: first, to develop and manage interdisciplinary GIS collaboration through faculty connections, collaborative research conversations and new partnerships. Modeled on faculty learning communities, the intention was to start with existing faculty users to support geospatial use and development by matching faculty with students, arranging integration of GIS into different areas of the university and setting in place strategic methods of data sharing and collaboration. Out of this set of aims came the decision to develop the library's support for this work as an Initiative in Spatial Literacy rather than simply as a GIS specialist and technical support staff.

The second leadership decision and direction, focused this time on technical support, was similarly outward looking. It focused on supporting diverse currently-developing faculty and student interests in spatial mapping and research at different levels of skill and technical comfort through creation of collaborative workshops and seminars. This allowed the use of GIS and spatial tools on campus to emerge and evolve at various scales and intensities.

Asked to provide research assistance to students, faculty and community, the director decided to instigate such research support through the structure of the Initiative itself, bringing people into the intellectual space of the Initiative rather than moving to support them in their individual silos. This was done pragmatically through the development of university-wide spatial data standards and the creation of a community of connected GIS users, again bringing a knowledge of the

developing capacity to the users through existing structures of collaboration within the university.

The library's request for conducting multiple instructional sessions could have overwhelmed the Initiative from the start. Instead, the director started from the idea of building a base of understanding within the library and then stretching it into other disciplines in phases. Basic training was first provided to library staff on the use of simple GIS software and on how to start to look for spatial data, to help students and faculty access spatial datasets and to uncover spatially-descriptive research tools. It is from these early library classes that the fruitful librarian/director collaboration grew.

Online instructional tools was a fourth item on the library's original GIS wish list. However, rather than re-write workshops, many of which already exist for proprietorial systems, the Initiative decided to concentrate on setting up a GIS access portal for the university and to arrange strategies to purchase access to online instruction. The library was then able to provide skillful support with its strong, existing team for web access and design.

Subject librarians were instructed to help promote GIS services across the community. But from the beginning, the director's attitude was that, instead of emphasizing specialized GIS possibilities in their subject areas, their primary role was to promote the beginning of a university-wide GIS conversation and to work towards the creation of a system of shared conversations and an open attitude towards spatial data.

Thus the most important, but least measurable, ambition of the Initiative was to create a new mindset and a strategic direction for spatial thinking and support for the university through the creation of a collaborative space for faculty and students teams who were working in isolation, each with their own spatial data struggles. The tools for creating such collaboration have included not only twice-semester gatherings with food, drink and conversation, but the setting up of systems for data sharing, a new data/server structure and a database of students and TAs with GIS skills who can be called upon as research assistants. This intention was greatly improved upon when the opportunity appeared to create a physical space for collaborative digital work.

Finally, the map collection itself and the management of this collection have been marked as an independent project. The scanning and geo-referencing of the library's most unusual items, particularly local historical maps, are being integrated into the broader priorities of the university's digitizing and digital archiving process.

#### Enhancing interdisciplinary research with GIS services from the library

GIS is a rapidly growing area of development on many university campuses. Often GIS support services are located in a technology or digital support center or hosted within a department such as Geography or Engineering. However, in this case, the integration of GIS into a center for Spatial Literacy and the location of this center in the library opens up the possibility for the development of the Initiative in three interesting ways.

First it encourages students, particularly Engineering students, to reconnect with the library; second, it encourages participation in interdisciplinary work for all students, including



Engineering students. Finally, together with classes both in Engineering and beyond, it creates an opportunity for innovative and collaborative processes. While the GIS classes, both departmental credit classes and library-supported workshops, do of course remain somewhat silo-ed, nonetheless, perhaps due to the shared GIS lab space, students have tended to move across departmental lines to take classes and to participate in more collaborative work, with a tendency towards more innovative practices. While these processes are not necessarily integral to the GIS itself, there can be some conjecture that through the overlap of a new spatial way of working, the unfamiliar context of spatial data and the physical connection between students from different disciplines working in a shared space, that new creative potentials may be able to be integrated in very promising ways.

Using data from several different kinds of GIS teaching events undertaken by the Initiative in its short existence, we attempt to show that these three types of interactions have, indeed, taken place and have impacted students from Engineering. Finally, we hope to argue that the Initiative has allowed the library to support not only technical learning but to reach towards more broadly described aspects of teaching and learning in the areas of innovation and collaboration.

#### Disciplinary participation in library GIS workshops

Although a few existing courses at the university were already integrating some GIS into their curriculum, the new Initiative was very quickly utilized soon after its launch as a vehicle for professors to request in-class workshops for GIS instruction. Building on this, the Initiative started to develop and offer a couple of open introductory workshops in a year. These workshops served patrons from throughout the university providing help with basic spatial skills needed to work on independent projects. Such sessions were usually open to faculty, staff and students. Finally, since September 2017, the GIS lab now offers office hours staffed by graduate students from multiple disciplines (Anthropology, Engineering, Geology) where students can receive one-on-one extra help with their GIS projects or in developing new project ideas and possibilities. Workshops taught by the Initiative for Spatial Literacy (ISL) staff have taken place in classes for History, English, Economics, Sociology, Political Science, Geography, Anthropology, Archaeology and Education, as well as in Engineering. Working with such a varied group of students is a clear display of the collaborative, interdisciplinary potential of GIS for the library.

In addition to these hands-on workshops given since 2016, the program has developed a series of events with outside invited speakers who are invited to conduct additional open, campus-wide workshops in areas as divergent as education and crime. Of the various different workshops offered, the GIS Bootcamp held in February/March of 2017 was the most-widely attended; this was an intense week-long series of workshops taught by a highly qualified outside instructor with experience working across the Humanities and Social Sciences. (See figures 1 and 2 - attendance at internal library staff-taught workshops, and external guest-taught workshops).

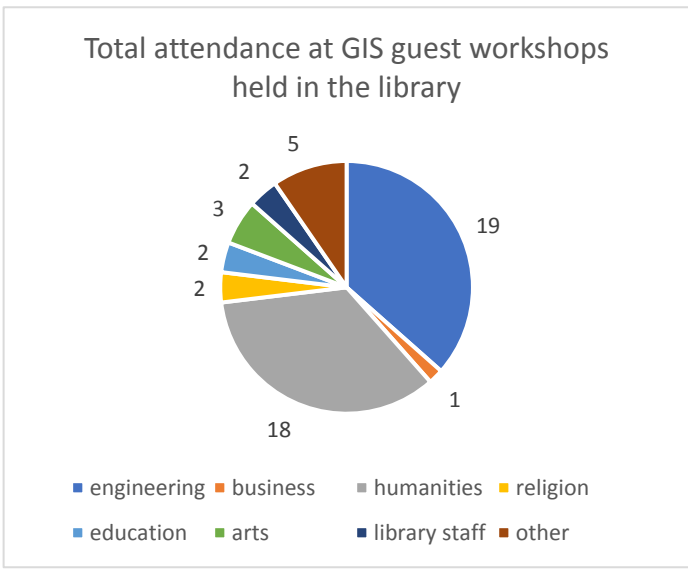
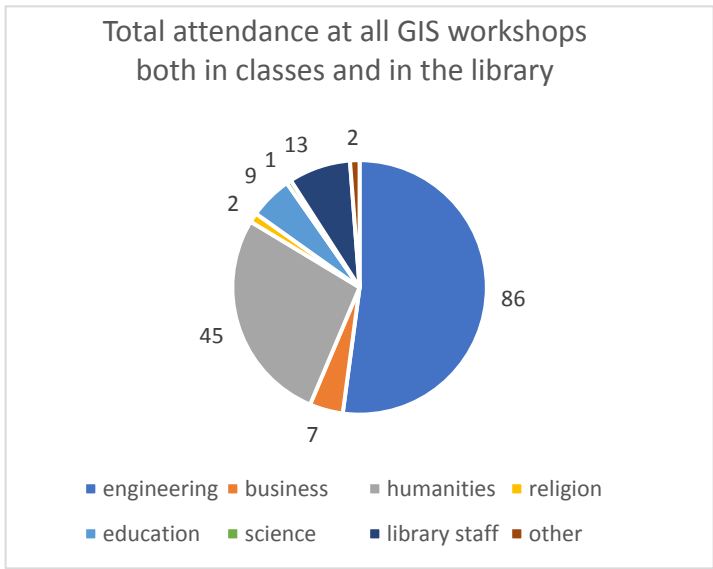


Figure 1

Figure 2

Data from both of these sets of workshops show, first of all, that GIS training and support has been widely pursued across disciplines, both in the Humanities and Sciences. Secondly, more interestingly, they show that participation in such workshops is taking place across academic areas. Especially interesting is the heavy participation which seems to come from the area of Engineering, a school which has not recently demanded great support from the library and with whom the library has had difficulty engaging. This change is clearly demonstrated by making a comparison between the data from the library’s GIS workshops and those (in figure 3 below) which show the total attendance at other library workshops over a similar period. In that non-GIS based series of workshops, in contrast to the GIS workshops, majority attendance comes from students in the Humanities and even Business school attendance equals that from Engineering.

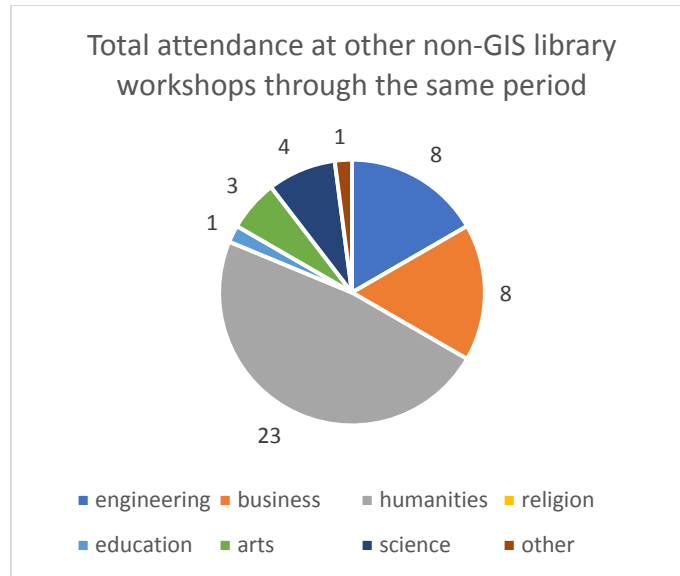


Figure 3

An added value therefore of the spatial literacy program has been its ability to bring Engineering students and faculty back into the shared context of the library; first, potentially encouraging them to make use of other library services, and once they are more comfortable within that context, opening up the possibility for more disciplinary overlap in the greater university mission of developing a community of learners.

#### GIS lab: flexible group-work space

In 2016, shortly after the main library had undergone widespread renovation, one of the rooms in the library was set aside as a multi-purpose technology room. Equipped with a mixture of more powerful fixed computers (Dell Precision Tower 3420 SFF and paired monitors) and dedicated laptops, the room is structured around the possibilities for collaborative shared work with two moveable projectors and projection screens, a built-in teaching smart-board, and white-boards on all four sides of the room. All moveable, the furniture ranges from coffee tables with low armchairs to single and four-person tables. Figure 4 below show images of this space. A named donor provided funding for this experimental collaborative technology and GIS lab. Daily office hours are provided by two teaching assistants who were hired in September 2017.



Figure 4. Images showing collaborative group design of GIS lab in the library

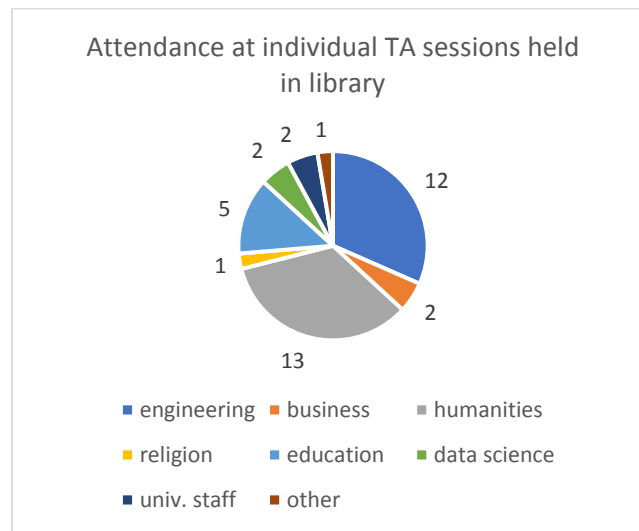


Figure 5

### Patrons reached

Figures 1, 2 and 5 above show that the students who attend both the workshops and the TA sessions are from a wide variety of disciplines, however with a strong showing from Engineering. It is worth noting that within Engineering, there has been a high proportion of interest from Civil and Environmental Engineering which includes a Sustainability program, and from the school's program in Design and Innovation. However, there has also been an interesting new presence of students from Education and Economics in these various sessions, areas of disciplinary support in which the Initiative hopes to develop and grow.

Cognizant of the importance of democratizing use and access to GIS and enhancing the teaching of spatial literacy, the program is also connecting with K-12 education. First, the program has supported the outreach work of the School of Education, assisting in the provision of summer workshops for middle school teachers from local schools in the area. Moreover, the Initiative

collaborates with a local area high school which has a remarkable and long history of advanced GIS work, both to participate in and support their annual geo-technical conference. This brings Education students into the context of the GIS high-school classroom and high school students into the world of university Engineering.

#### Collaboration – the benefits

A basic cost-benefit analysis of Central University Library approaching a faculty member to head this very important library initiative reveals nothing but positives, far beyond what the library had envisaged, or beyond anything that the library had experienced before now, in terms of actively working with a faculty member. The benefits of such collaboration have been manifold; the connection of the library to active participatory learning, for example, a collaborative workshop on using drones to gather geospatial information, cannot be underestimated.

Also, the development of new initiatives with three different faculty research clusters in the university, supported by the Center for Interdisciplinary Studies - the GIS research cluster, the Digital Humanities cluster, and a Human Rights cluster, (documenting and mapping local spaces of human rights history) - have all been made possible because the Initiative's director is a faculty member who has actively reached out to connect with such groups in her dual role as faculty and head of the Initiative. The ongoing collaboration with, and support for, the Digital Humanities has engendered an unusually active interaction between science-based GIS and humanities-based GIS on campus and a growing area of collaboration between the Engineering Librarian and the librarian who supports the Digital Humanities.

Even in terms of student interaction, the programs offered by the Initiative foster connections between Engineering students and those studying other fields such as Law and Statistics. This was clearly evident during the participation of these different groups in a "Crime Mapping" workshop taught by another guest instructor last spring. Certainly, the potential that mapping has towards inter-disciplinarity encourages such collaboration. However, we posit that having a faculty member, one from the School of Engineering above all, spear-heading this Initiative that is born out of the library and housed in the library has allowed many, particularly Engineering students to no longer to see the library as such a "foreign" place [quotation marks are added by author for emphasis], but a place that offers them a service that they find useful and one that they feel confident using. The new GIS lab facility encourages such connection; a graduate GIS class in Civil Engineering, for example, was partially taught in the library lab, and another in Digital Humanities is currently being taught there this spring. Each class already has students from different disciplines and bringing them together into the library only encourages this collaborative conversation.

Having a professor lead the program also lends some additional credence. We submit that it adds more value because other faculty feel very comfortable asking another faculty member for help because they believe, correctly or not, that she understands their needs better.

## Enhancing librarian-faculty collaboration

Since being approached by the Engineering Librarian, who revealed a strong interest in working with the program, the director and librarian have developed a fully collaborative structure and are now essentially co-managing the program. From attending technical meetings with staff from the Office of Information Technology (OIT) about needed technical support, to planning programs and events for the year, the two have formed a meaningful collaborative relationship “which has facilitated an affiliation between the library and the community of GIS practitioners.”<sup>25</sup>

Both attend meetings with other faculty or staff who have questions about the program and the types of services offered. Even though one of the director’s roles is to provide leadership in planning, developing and managing the program, the director has been very open to hearing views from others as to how the program can offer more support to other areas. Other groups that have not been traditionally served by the library – e.g. the campus police and facilities departments - have reached out and sought help with GIS mapping. At the university’s off-campus location in Taos, the Anthropology and Archaeology departments are also now asking for GIS support for their summer field school and seeking to invest in the small library there to update and support the required level of technology.

In the early stages of implementation of the Initiative, all GIS instruction was done by the director. However, as more professors campus-wide continue to request GIS workshops within their classes, responsibility is being divided – with introductory sessions taught by the Engineering Librarian. Requests for instruction sessions are made directly to a dedicated email address operated by the librarian. Now that the librarian has taught more classes and gained comfort with both the subject matter and teaching process, the collaborative nature of the Initiative has developed greater teaching capacity; this is now shared between staff and faculty roles. It is anticipated that this may serve the university as a model for the collaborative development of other areas of technical and creative support that libraries are now called upon to serve, such as the developing area of Digital Humanities.

## Enhancing links to the school of engineering

Project-based, local participatory work already takes place in the School of Engineering through collaboration with an Institute for humanitarian interdisciplinary collaborative research and practice. GIS was already being used in this context to serve projects with Engineers Without Borders. While housed in the School of Engineering, students from multiple disciplines participate in this institute. Embedded into this context GIS students now participate in such project work, working on mapping and spatial analysis teams under the supervision of the director of the Initiative for Spatial Literacy.

## Challenges

The apparent success of the program has engendered attendant challenges that have to be addressed. One such challenge is that the adjunct faculty member now has to spend more time addressing GIS-related issues, taking her away from her engineering-related work. As the

program develops the Engineering Librarian's job is also slowly evolving. She is being asked to take on a number of other tasks which include developing systems for the creation and teaching of metadata to assist students when they're submitting the spatial data for their projects to the GIS server. As part of her developing expertise in the area of geo-spatial data and metadata she now serves on various library committees working on university-wide issues of digital data support, developing structures for storage and retrieval systems for spatial data structures. While her main role remains as the liaison to the School of Engineering she is increasingly expected to work with students from other areas who are moving into the world of spatial research.

Another challenge for the Initiative is the uneven technological support that exists for such an interdisciplinary venture. Since GIS is technology dependent there are frequent needs that only people in the IT department can meet. For example, liaising with the proprietary software office to install new software or developing an understanding of the backend of the specific GIS software programs in order to make them run as they should. Despite the Office of Technology's efforts there is no specific designated staff who can work across the range of all the different aspects of GIS-related technical issues; it has been a complex path to start to develop lines of support for quick problem solving.

One of the bigger challenges is the lack of technological infrastructure to store locally-generated spatial data. Currently, the spatial data generated by students are stored on a shared open drive on our local campus server, and not in any robust spatial data storage location, leading to predictable complexities due to issues of lack of metadata, data privacy and data management. Even though the data currently generated is small, it is evident that this will change and then the problems currently faced will only exacerbate.

#### Future plans

The program will continue to grow with additional workshops being offered, data storage and access systems being developed, and new workshops and courses being created, some of which will be more subject-targeted. A new collection of research and teaching support materials is being developed which will be housed in the GIS lab to support geospatial research.

Efforts are now being made to develop a Digital Humanities program in the library, modeled after the Initiative. Preliminary talks have started as to how the GIS lab space could grow into a lab for digital scholarship, a space that could serve as a central hub for researchers doing spatial and visualization work as well as text-based digital exploration. It is hoped that the site could become the nexus for science-based GIS and humanities-based GIS research on campus. However, in order for that to happen more resources would be needed to acquire more technology. Ideally, the university will develop a strategy to grow digital scholarship on campus so such projects and programs will be centrally funded.

An added bonus is that the director has grown to better understand how the library works and the unique position that the library has as the heart of the university. She has become an ardent advocate for the library to be among the first to have necessary technology and software.

## Conclusion

At this point in time, the library is very satisfied with all that has been accomplished through the Initiative. The decision to hire an adjunct faculty member to lead the program, we believe, has added to the success of the program. The potential for the library to develop similar partnerships in other areas of the university is enhanced because of the successful model that the Initiative represents. The successful faculty-librarian collaboration that has emerged out of this program is an indication that when done right, with mutual respect for each other, such a collaboration can be tremendously beneficial to all. The Initiative for Spatial Literacy has provided opportunities for patron populations that have not traditionally been great library users (for example, those in Engineering) to use the library and interact with others in ways that they may not have ordinarily had the chance to do. Adding value, adopting methods that are unlike those that libraries have historically used to serve patrons, and doing it successfully, is an acknowledgement that libraries do need to transform to remain relevant in these fast changing educational contexts.

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