

Utilizing User-Centered Design for the University of Victoria's  
International Connections Mapping Application

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BSc, University of Victoria, 2007

A Thesis Submitted in Partial Fulfillment  
of the Requirements for the Degree of

MASTER OF SCIENCE

in the Department of Geography

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## **Supervisory Committee**

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by

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## **Abstract**

This thesis explores the design of a website to communicate international activities undertaken by or associated with the University of Victoria. The research was seeded by and undertaken in collaboration with the University of Victoria's office of Vice-President Academics and Provost, and the Office of International Affairs. The thesis introduces and implements a product design process to create a mapping application for the university to display all of its international connections. The thesis advanced the study of how to incorporate users into the design process of an online map.

User-centered design is an established practice of studying users and collecting their feedback during all stages of design. This process has begun to be used for online mapping. A challenge with online mapping is that potential users can be an unwieldy community. In this case study the users could come from anywhere within the UVic community, but also the public. With such a large and diverse group, incorporating all the potential users into the design process is not possible. A challenge therefore is to capture feedback from a meaningful representative sample of potential users.

This research describes a process of user-centered design in which a sample of users were surveyed at the beginning of the process to determine their requirements and preferences for a mapping application, and then interviewed to test the usability of the product.

The thesis concludes with recommendations for design and layout of an online mapping application, including identification where further study or decisions are required.

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## **List of Abbreviations and Acronyms**

|      |                                      |
|------|--------------------------------------|
| GIS  | Geographic Information Sciences      |
| GUI  | Graphic User Interface               |
| OIA  | Office of International Affairs      |
| UCD  | User-Centered Design                 |
| UVic | University of Victoria               |
| VE   | Virtual Environment                  |
| VPAC | Vice President, Academic and Provost |

## Acknowledgements

My first thanks are to my supervisors, Dr. Peter Keller and Dr. Ian O'Connell.

Without their advice, support, encouragement, and pressure, I would surely have never finished this research. I may not have been the prototypical graduate student, but I thank them for giving me space when I wanted it, and a push when I needed it.

As with any research in which participation is required, I wish to thank the many people who donated their time to provide input to the research. The many anonymous survey respondents provided invaluable input, and the people who took even more time to participate in the prototype interviews were particularly important to developing the mapping application. User-centered design relies on people providing feedback, so I am grateful that people made the commitment to be a part of this project.

I would also like to thank VPAC and OIA for their idea of creating this mapping application and their commitment to producing the first prototype. Although this prototype was outside the research, this project was the catalyst for the continuing study and implementation of user-centered design.

Final thanks must be extended to my family. First, to my loving wife and best friend Pamela, who put up with a two-year program extending a little too long. Her encouragement, support, and unending faith that I would finish were a constant push to prove her correct. And second to my parents, Peter and Nancy, and my brother Alan, who have always been there when I needed help, or just changed the subject when I needed to think about something else. Thank you.

# 1. Study Rationale and Research Framework

## 1.1 Introduction

Designing a new product is always a challenge. Creating a new version of an existing product allows the designers to tailor the product to the needs of the established user group. Creating a new product, however, requires initial interest from a stakeholder, identification of a group of potential users, and securing support for its implementation.

This research focused on the development of an online mapping application for the University of Victoria (UVic) to communicate international activities. The initial framework built on ideas from community mapping. As research progressed it became obvious that a user-centered design (UCD) incorporating end-users into all stages of design was a methodology that offered promise. The research reported here therefore focuses on how to engage users, and to test a way of using representatives from a large group of users to study a prototype and collect feedback during the UCD process.

In this case study the user group could only be hypothesized. Following the UCD process therefore would pose a few challenges. The primary of these challenges was how to get meaningful input and feedback from the users through multiple stages of the design. By designing a new product, potential users may not be aware that it would be useful, and therefore buy-in to the process can be difficult to garner. Minimizing the time commitment required, while maximizing the feedback collected, would therefore be critical to the success of the project.

This thesis begins with a review of community mapping and UCD. It also discusses a critical review conducted by the researcher of existing mapping applications in use by

universities worldwide to learn about comparable products already available. The remaining six chapters follow the UCD process to outline the possible design of UVic's international connections mapping application from the original concept through to the conclusion of prototype testing. The thesis concludes with a discussion about the remaining challenges to implementing a final product on the UVic website and keeping that product up to date, implications of the research, and conclusions drawn from the design process.

## **1.2 Literature Review**

### **1.2.1 Community Mapping**

Defined so simply as to be obvious, community mapping is the process of creating a map by a community and for a community. In this introduction to community mapping, both aspects of that definition will be looked at. First, "creating a map", and later "a community".

#### **1.2.1.1 Creating a Map**

Mapping has a long history that can be traced back thousands of years to lines drawn in the sand, to pictures and scratches on rock, and to models built from available materials. The early maps could depict everything from a local village to the heavens (Harley & Woodward, 1987), but were relevant on a local scale to their creators and their local community. As human populations developed, the need for maps expanded. With the growth of the Greek and Roman empires, maps became a tool for planning and resource tracking. This period also saw maps begin to include scale drawings and sophisticated surveys of the land (Harley & Woodward, 1987).

During the European dark ages, maps shifted to have a more religious focus and many of the mapping techniques developed earlier were lost. As power shifted from science to religion, maps similarly shifted from depicting the physical world to depicting religion and the heavens. While many of the techniques were retained in the Arabic countries, they would not regain significant use in Europe until the Renaissance (Harley & Woodward, 1987).

As European kingdoms began to grow during the middle of the last millennia, explorers began to look beyond their local environment to newly discovered regions and their riches. The resulting maps were used as political tools to solicit support for expansion, to track resources and inventories, or to display holdings (Harley & Woodward, 1987).

Who created maps through history is as interesting a question as what maps were being created. There is no way of knowing who within the community created the earliest pictures and scratches, but their appearance suggests universality to the practice (Harley & Woodward, 1987). As maps became more sophisticated, surveying and cartography became specialized skills. Similarly, religious maps created by the church were likewise created by a select few, usually those in positions of power. This specialization persisted through the colonial empires and into modern times. In decades past, published maps were generally the works of professional cartographers initiated and supported by those holding positions of power. With the growth of the computer, and subsequently the Internet, this monopoly has eroded. Identified as early as 1995 by Morrison (1997), this “represents a ‘democratization’ of cartography in which all individuals are potentially empowered with the available electronic tools to think geographically and to make visualizations of their thinking” (p. 17).

The growing ability of all map users to create their own maps returned cartography to the masses.

#### 1.2.1.2 A Community

Community is defined by the Oxford English Dictionary as “a group of people living in the same place or having a particular characteristic in common” or “the condition of sharing or having certain attitudes and interests in common” (Oxford Dictionaries, 2012). While community maps are generally considered to be created by local residents based on local knowledge and resources (Parker, 2006), the definitions of ‘community’ do allow for a much broader interpretation of a community map. With electronic communication becoming easier, communities can be generated with little bearing on the location of the members. Today, people spread across regions, continents, or the world can develop a community map.

#### 1.2.1.3 Community Maps

Community maps were born mostly by the desires of activists and protesters to have a medium by which to advance their causes (Aberley, 1993; King & Clifford, 1985). Examples of these are listed in Figure 1.1.

1. Reassert indigenous peoples' rights
2. Re-map lost place-names
3. Re-publish the past for contemporary consumption
4. Protect local wildlife in the face of development
5. Conserve landscapes threatened by agribusiness
6. Advance local claims to land
7. Put forward arguments over resources such as forests, minerals or fishing
8. Protest against planners
9. Oppose military power
10. Reject surveillance
11. Show the powers-that-be what might be locally distinctive

**Figure 1.1: Causes that could be advanced through community maps (Aberley, 1993; King & Clifford, 1985).**

Through the act of creating a map, a community draws on its inherent knowledge and understanding, empowering the participants (Aberley, 1993; Crouch & Matless, 1996; Nietschmann, 1995; Lydon, 2003). Empowerment is defined in many different ways and each individual or organization can define and understand it differently (Duvall, 1999; Kyem, 2001). Empowerment through mapping also can be challenging to measure (Corbett & Keller, 2005, 2007). As a result, the value of community empowerment can be different for each individual or organization. These factors can lead to the people organizing or documenting community empowerment projects having different ideas than their participants (Kyem, 2001). Kyem (2001, p.8-9) summarizes the literature defining empowerment in the following four ways:

- A “distributional change in power” (p. 8) where access or opportunities are increased for participants.
- An acquisition of skills that allow individuals or communities to better assert control over their circumstances.

- A transformation beginning with building self-knowledge and self-esteem, resulting in a collective ability to promote change – a growth in human capital leading to a growth in social capital.
- A growth in individuals' desire and ability to control their own environment.

These definitions strongly relate to three of the typical goals of a community map discussed in the literature: self-definition and representing place, acquiring control over natural and/or other resources, and mobilizing collective action (Aberley, 1993; Lydon, 2003).

While the community map being created is an important product, the process is equally, if not more valuable to the community. "Community mapping can strengthen and rework community identity as representations often reflect and reinforce knowledge or perceptions of place." (Parker, 2006, p. 477).

## **1.2.2 User-Centered Design**

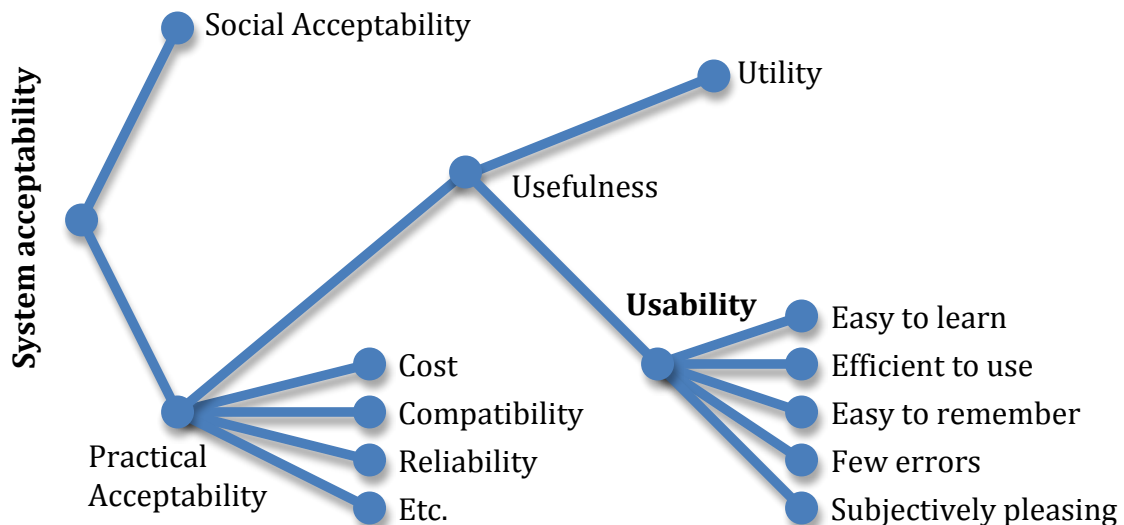
### 1.2.2.1 Utility, Usability, and Likeability

Brian Shackel (1991) describes three major aspects when judging the success of a new product: utility, usability and likeability (defined in Figure 1.2). These three are balanced by cost to determine the acceptability in the mind of a user, stakeholder or customer.

|              |   |
|--------------|---|
| Utility:     | will it do what is needed functionally?   |
| Usability:   | will the users actually work it successfully?   |
| Likeability: | will the users feel it is suitable?   |
| Cost:        | what are the capital and running costs?<br>what are the social and organizational consequences? |

**Figure 1.2: Definitions of Shackel's (1991) acceptability factors (p. 22).**

The goal of any designer is usually to design an acceptable product at the minimum cost. There are many suggested methodologies to achieve this. Some of them incorporate the users in the design process. With sufficient input from the users, the product designed should satisfy the criteria for utility, usability and likeability. The only remaining challenge would therefore be cost (Shackel, 1991). Nielsen (1993) breaks down a product's acceptability using some of the same components (Figure 1.3).



**Figure 1.3: Nielsen's (1993) system acceptability tree with usability components (p. 25).**

The key component identified in Figure 1.3 is *usability*. Nielsen (1993, p. 26) defines this using the five sub-components:

- Learnability - easy to learn
- Efficiency - high level of productivity once system is learned
- Memorability - easy to remember so that prolonged absence does not require re-learning
- Errors - low error rate and easy recovery
- Satisfaction - pleasant to use

Nielsen (1993) argues that these sub-components must be fully understood and addressed in order for effective methods of engineering and evaluation to occur.

#### 1.2.2.2 The Beginnings of UCD

User-centered design (hereafter referred to as UCD) is a very common method of product design that has been used by designers for decades, either intentionally or not. The actual term was introduced in 1986 by Norman and Draper (1986), but the first major paper to identify a method of incorporating users into the design phase of a product was published in 1985 by John D. Gould and Clayton Lewis. In this paper, the authors identified three main principles to be followed during the design of a product, 1) “early focus on users and tasks”, 2) “empirical measurement”, and 3) “iterative design” (Gould & Lewis, 1985, p. 300).

The first principle instructs designers to not only identify the potential users, but to understand them. This should be done by being in direct contact through the use of interviews and observations prior to the initiation of design. If a present system exists, Gould and Lewis suggest that users try to train designers to use that system. Through the

teaching, the designers would learn a lot about the users as well as their work and their problems.

Gould and Lewis's (1985) second principle, empirical measurement, encourages designers to run learnability and usability tests very early in the design. Through the use of prototypes, designers can see "how easily people can learn and use that prototype". (Gould & Lewis, 1985, p. 302) Because designers use a product differently than the users, prototype testing should present simple tasks to the users, during which their "performance, thoughts, and attitudes should be recorded and analyzed." (Gould & Lewis, 1985, p. 302).

The final principle identified by Gould and Lewis (1985), was iterative design. This principle recognizes that as problems are identified during the design and prototype testing, a product prototype needs to be returned to the users for more testing prior to design completion. The number of iterations would depend on the complexity of the product, but multiple iterations should be expected.

Designers interviewed by Gould and Lewis (1985) as part of their study noted that Gould and Lewis' design strategies were intuitively obvious. However, the research also revealed that most designers failed to identify most, if not all, of the steps outlined above when asked to identify steps themselves before commenting on Gould and Lewis's steps.

### 1.2.2.3 The Benefits of UCD

Financial implications are important when designing a new product (Shackel, 1991). Gould and Lewis (1985) acknowledge that an iterative design process can be more

expensive but justify it based on the improved final product. Bevan (2001, p. 8) agrees and argues that there can be significant financial benefits to the process. These are:

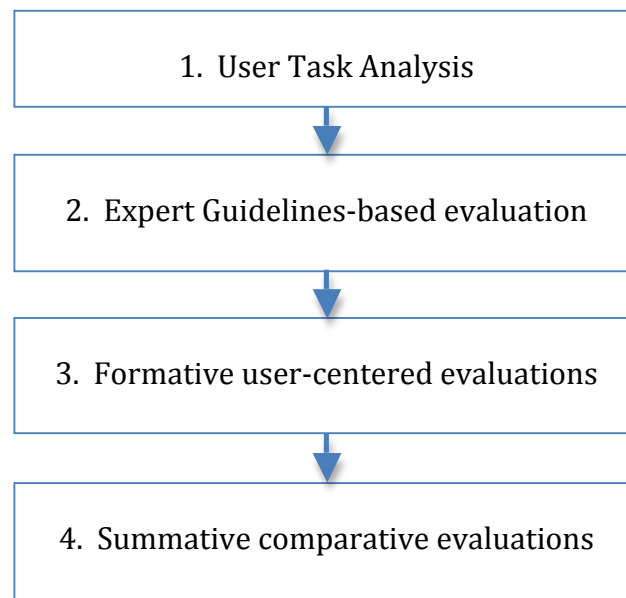
- Reduced development costs through early identification of user goals and usability objectives.
- Increased sales due to the desirability of usable products, the potential for a wider range of potential users, and customer satisfaction having the potential to create a strong reputation.
- Reduced user costs because a system catered to users' needs would increase productivity, reduce errors, reduce the required training, and promote task focus.
- Reduced support and maintenance costs.

#### 1.2.2.4 Evolving Methodologies

UCD principles began to be incorporated more regularly into design starting in the early 1990's (see Nielsen, 1993; Hix & Hartson, 1993; Beyer & Holtzblatt, 1998; Mayhew, 1999; Constantine & Lockwood, 1999; Rosson & Carroll, 2002). Design strategies published by these authors proposed minor variations on the original method while generally following the same principles outlined above. Following is a summary of the evolution of UCD from Gould and Lewis's (1985) principles to the current most commonly used process.

One of the first important variations was made when Gabbard, Hix, & Swan II (1999) outlined a four stage sequential process (Figure 1.4). The first stage follows Gould and Lewis's (1985) principle of focusing on the users and tasks. The second stage is added in order to ensure that established design guidelines are being followed. Multiple experts are recommended when testing applications incorporating virtual environments (VE), however evaluating more basic graphic user interfaces (GUI) still require more than one

expert to ensure that all usability issues are identified. Nielsen (1994) recommends three to five experts for a heuristic GUI evaluation. This stage relies on accepted design guidelines for the type of product being developed, which is not always the case. Many aspects of new products, however, will be similar enough to past designs that guidelines can still be found and used for the evaluations.



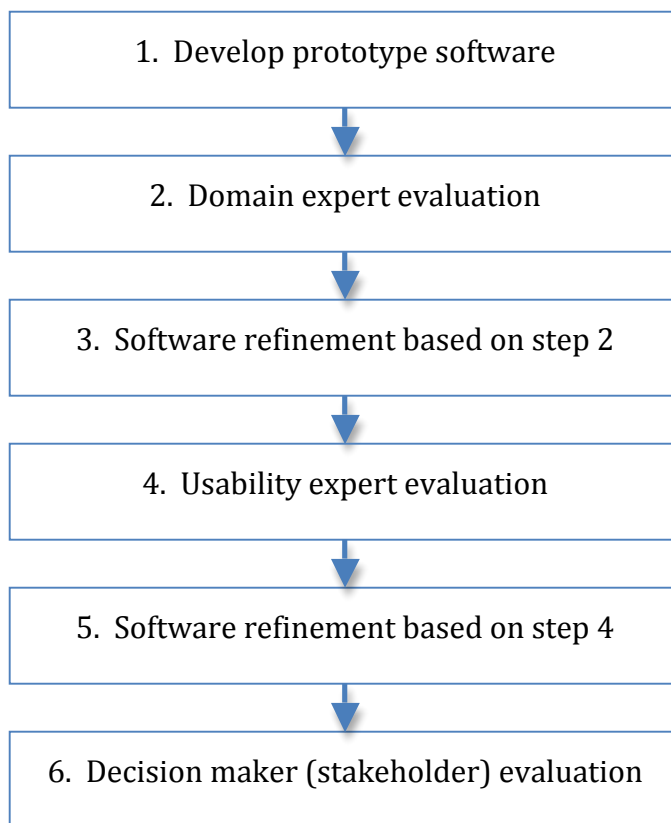
**Figure 1.4: Four stage sequential process described by Gabbard et al., (1999).**

Stage three of Gabbard et al.'s method (1999) uses an iterative system of task scenarios and user input. Users perform the scenarios with qualitative and quantitative data collected by the evaluators. These data are used to make improvements to the design; the scenarios are refined, and then returned to the users for testing.

The final stage is called “summative comparative evaluations” (Gabbard et al., 1999, p. 51). This stage is described as contrasting to the formative evaluations of the previous step. Here the same user task is performed multiple “more-or-less final versions of

interaction designs” (Gabbard et al., 1999, p. 54) to statistically determine superiority. This step not only relies on multiple designs of a product to be capable of performing the same task, but also critically relies on a quantitative method of defining which method is better. The criteria and system of measurement must be established prior to evaluating.

The early 2000’s saw a number of usability studies on geovisualization (Andrienko, Andrienko, Voss, Bernardo, Hipolito, & Kretchmer, 2002; Edsall, 2003; Haklay & Tobon, 2003; Slocum, Cliburn, Feddema, & Miller, 2003; Suchan 2002). One of the most significant of these to the evolution of UCD was by Slocum et al. (2003) during the development of a water balance model. Their method involved six established stages shown in Figure 1.5.



**Figure 1.5: Six stage sequential process described by Slocum et al. (2003).**

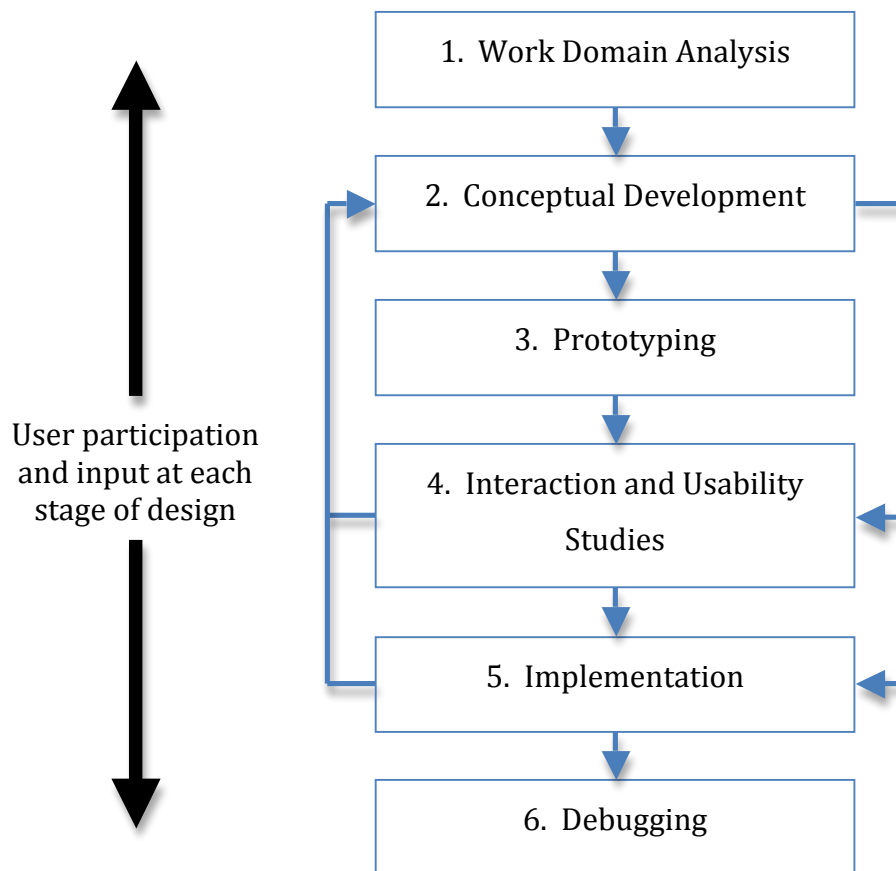
The major difference between this methodology and the principles outlined by Gould and Lewis (1985) and methodology of Gabbard et al. (1999) is the development of a prototype prior to any interaction with users. Slocum et al. (2003) justified this primarily because the product being developed was the first of its kind. With no predecessors, the authors were unsure of the results of the model and therefore they, as well as the experts, users and decision makers (stakeholders), would have difficulty envisioning the potential and the outcome of the product without some of the capabilities being demonstrated. Incorporating users after key aspects of the design were determined solely by experts was eventually regretted by the authors and they recommended future design processes to solicit input from users as early and as often as possible (Slocum et al., 2003).

Robinson, Chen, Lengerich, Meyer, & MacEachren (2005) made the next major adaptation of Gould and Lewis's (1985) principles during the development of geovisualization tools for epidemiology. This method used six stages and built on the experience of Slocum et al. (2003). It did return the focus on including the users in the design process from the beginning. The six stages are illustrated in Figure 1.6.

Having the first stage be work domain analysis reflects the importance of including the users in the design as described in Gould and Lewis's (1985) first principle. From the initial analysis, conceptual development was able to progress in an iterative fashion using formal meeting with the design team, the stakeholders and through informal emails (Robinson et al., 2005).

The third stage, prototyping, was conducted concurrently with the fourth stage, interaction and usability studies. This melding of the two stages reflects the iterative nature needed for successful UCD. The interaction and usability studies conducted by

Robinson et al. (2005) ranged from formal settings in laboratories with recording equipment to interviews and focus group discussions and to asking users to test prototypes and provide feedback. The authors also noted that a lot of assessment occurred internally by the development team during prototype development and prototype refinement.



**Figure 1.6: Robinson et al.'s (2005) six-stage UCD process.**

The fifth stage, implementation, reflected the changes made as a result of the studies and assessments. These implementations created new design issues and so often resulted in a need to “return to the proverbial drawing board” (Robinson et al., 2005, p. 7). It is at the final stage, debugging, that “the application is adjusted to enhance stability, compatibility, and make the most out of the computing infrastructure in which it has been

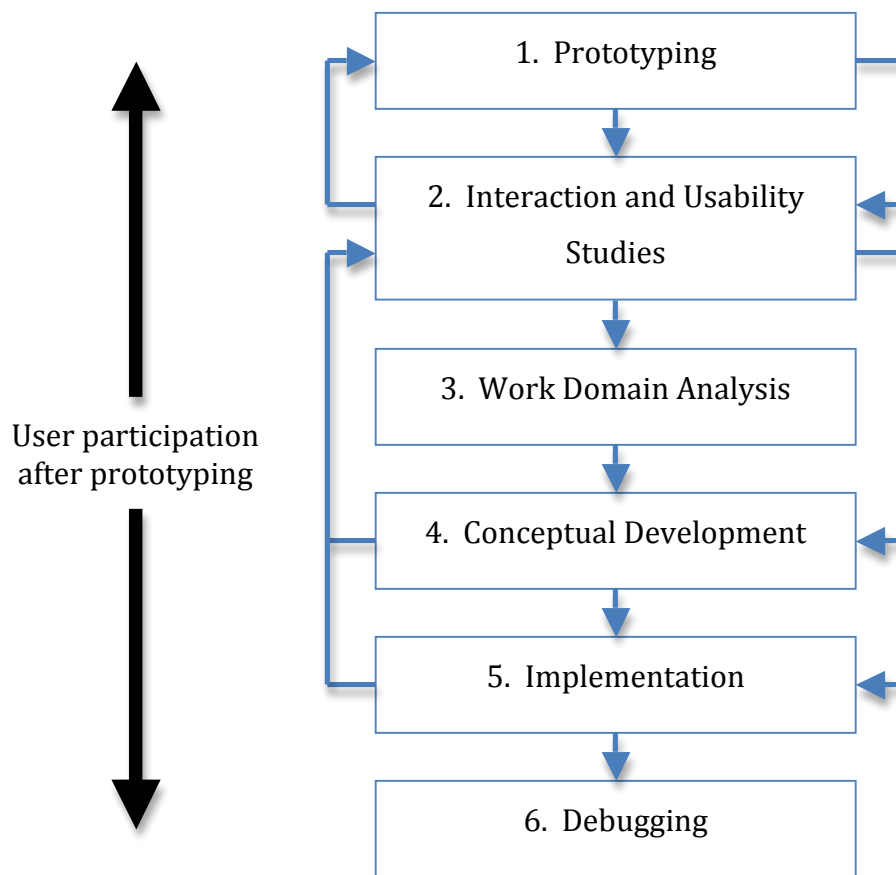
implemented” (Robinson et al., 2005). The authors provided feedback mechanisms such as web based issue trackers, links to email support and follow-up phone calls.

While Robinson et al.’s (2005) six-stage process is now generally accepted as the ideal, Roth, Ross, Finch, Luo, & MacEachren (2010) discuss situations where a modified approach would be necessary. This approach returned to a similar order to Slocum et al. (2003), in which the prototype was developed prior to a work domain analysis. This runs the risk of “the project team [designing] for an imagined (and thus non-existent) user group and ultimately may limit the utility of the application” (Roth et al., 2010, p.3). Roth et al. outline reasons as to why a work domain analysis may not be the first step:

- A prototype may be necessary to secure adequate funding for user input.
- A poorly managed product may be taken over by new designers, or they may be designing a new version of an existing application.
- Designers may not have access to the users, or the users might be unknown.
- The product may be so specialized as to have been designed for only the designers themselves, but is now marketable to a wider audience.

In this case, the UCD process has the same six stages, but they are in a different order and require two separate iterative sections (Figure 1.7).

While other recent projects have utilized or studied UCD (Koh, Slingsby, Dykes, & Kam, 2011; Roth et al., 2010; Schumann & Tominski, 2011), most use the method developed by Robinson et al. (2005) or the earlier methods proposed by Gabbard et al. (1999) (Figure 1.4) or Slocum et al. (2003) (Figure 1.5).



**Figure 1.7: Roth et al.'s (2010) modified user-centered design approach.**

### **1.2.3 Review of universities' current online mapping websites and applications**

#### 1.2.3.1 Introduction

Between March 22<sup>nd</sup> and 24<sup>th</sup> of 2011 a critical review of the use of maps on university websites was conducted. This review was to serve two purposes. First, a basic understanding was sought of how many universities had recognized the benefits of presenting data about international activities geographically. Second, the review would perhaps present a best practice online mapping application that could be used during the

design of UVic’s mapping application prototype as a foundation for design ideas and display methods.

### 1.2.3.2 Methodology

The review was conducted over two days in order to ensure that a snapshot was captured for all the reviewed universities at a single time. In preparation for the review a list of forty universities was compiled based on two sources. First, the top Canadian universities were chosen based on the 2010 Maclean’s annual university rankings (Macleans.ca, 2010). From Maclean’s rankings, the top ten “Medical Doctoral” and top ten “Comprehensive” universities were selected (Table 1.1). (Macleans.ca, 2010)

**Table 1.1: List of top Medical Doctoral and Comprehensive universities, as determined by Macleans (2010).**

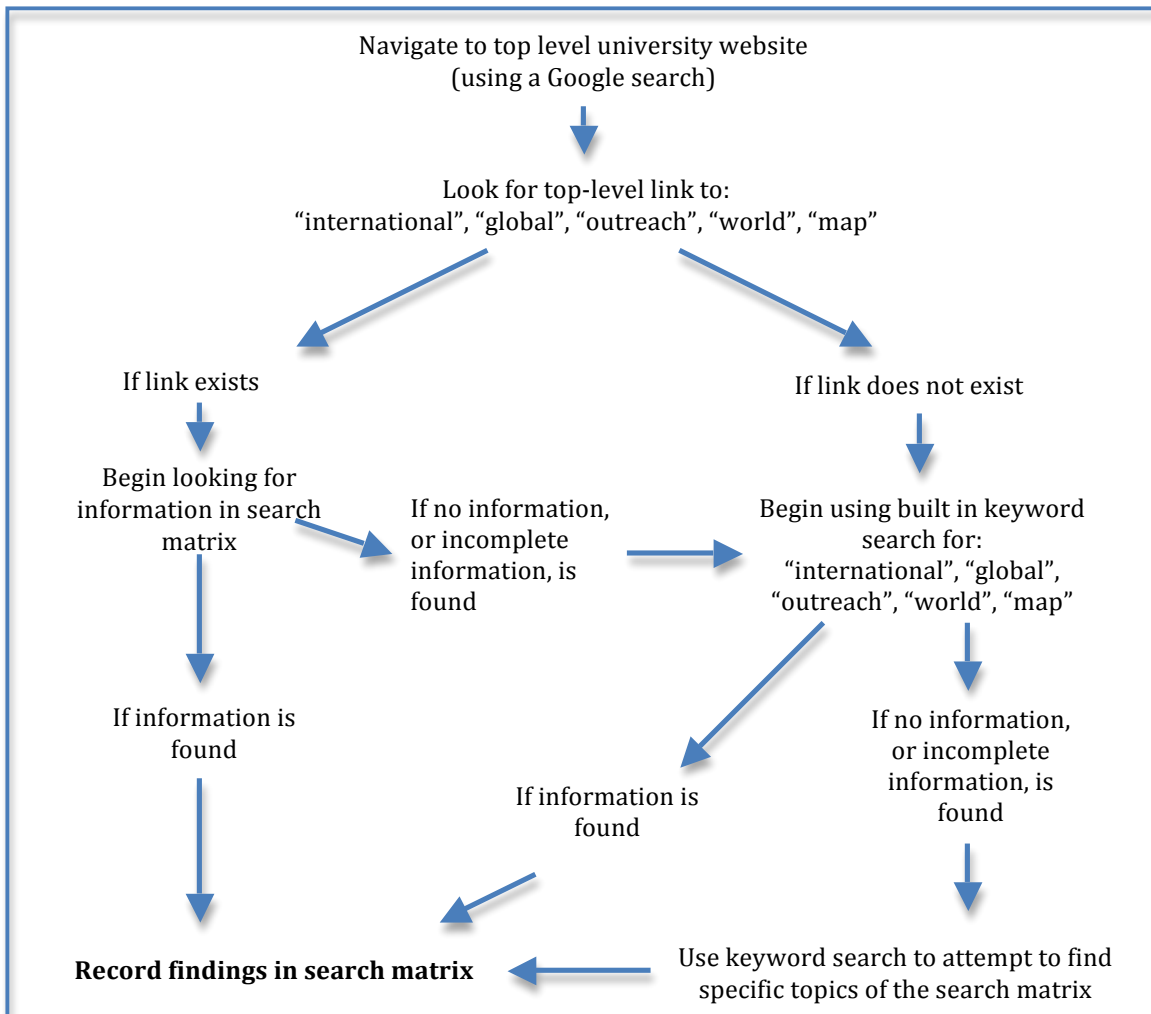
|  |  |
|--|--|
| <p><b>Medical Doctoral:</b></p> <ol style="list-style-type: none"> <li>1. McGill</li> <li>2. Toronto</li> <li>3. UBC</li> <li>4. Alberta</li> <li>5. Queen’s</li> <li>6. McMaster</li> <li>7. Dalhousie</li> <li>8. Calgary</li> <li>9. Western</li> <li>10. Saskatchewan</li> </ol> | <p><b>Comprehensive:</b></p> <ol style="list-style-type: none"> <li>1. Simon Fraser</li> <li>2. Victoria</li> <li>3. Waterloo</li> <li>4. Guelph</li> <li>5. Memorial</li> <li>6. New Brunswick</li> <li>7. Carleton</li> <li>8. Windsor</li> <li>9. Regina</li> <li>10. York</li> </ol> |
|--|--|

A further twenty universities were selected from the Times Higher Education World University Rankings (*World University Rankings*, 2010) (Table 1.2). University of Toronto, having already been reviewed as part of the list of top Canadian universities, was ignored in this list and therefore the 21<sup>st</sup> on the list was included.

**Table 1.2: Top universities worldwide, as determined by the Times Higher Education World University Rankings (2010).**

|  |   |
|--|---|
| 1. Harvard University                    | 11. University of California Los Angeles  |
| 2. California Institute of Technology    | 12. University of Chicago                 |
| 3. Massachusetts Institute of Technology | 13. Johns Hopkins University              |
| 4. Stanford University                   | 14. Cornell University                    |
| 5. Princeton University                  | 15. Swiss Federal Institute of Technology |
| 6. University of Cambridge               | 16. University of Michigan                |
| 7. University of Oxford                  | (17. University of Toronto)               |
| 8. University of California Berkeley     | 18. Columbia University                   |
| 9. Imperial College London               | 19. University of Pennsylvania            |
| 10. Yale University                      | 20. Carnegie Mellon University            |
|  | 21. University of Hong Kong               |

The review of university websites was conducted in as systematic a method as was possible with the very different site designs found on each website. A flow chart of the search method can be seen in Figure 1.8.



**Figure 1.8: Search matrix for university data maps.**

The search for comparable information to that being displayed as part of this research began with navigating to the university's top-level website (for example [www.mcgill.ca](http://www.mcgill.ca)). Keywords were chosen with input from the researcher's supervisory committee that were likely to find any reference to international connections and mapping applications. First, the website was examined for a top-level link including the words 'international', 'global', 'outreach', 'world', or 'map' (campus maps that were strictly for navigation were ignored). A 'top-level link' for this research was defined as any link

immediately visible on the top-level website, or a link that would appear in a dropdown list when a heading was hovered over or expanded. This link was followed if present. If not present, these keywords were searched for using the built in keyword search built into the website. If the top-level link did not reveal all the data being searched for, the keyword search was also conducted. The goal was to complete the search matrix (Appendix I) as thoroughly as possible, with particular attention to finding any maps and interactive maps that may be displaying this information. If information regarding one or more of the topics found in the matrix was not found, it was searched for directly by, for example, looking for links including the words “exchange” or “research” or using the keyword search for these words.

#### 1.2.3.3 Results

The results varied widely between the universities, with no clear pattern between either higher ranked universities versus lower ranked, doctoral versus comprehensive, or Canadian versus international. The only exception was that Harvard University, being the top ranked international university, had a powerful mapping application, although with limited scope. This map had formed the nucleus for UVic’s interest in developing a mapping application, as will be discussed in a Chapter 3.

#### 1.2.3.4 Examples

The following are examples of some of the data presentation methods found during the critical review. The first series of examples show websites that have no geographic display, but present significant data in other methods. The second series of examples show websites with a geographical component, either a static map, or a map with some degree of

interactivity. A linked list of all the universities along with referenced content is available at: <http://mapping.uvic.ca/interproto/masters-thesis-online-content>.

#### 1.2.3.4.1 Examples of databases without maps

McGill University:

McGill had a relatively in depth database of the possible exchange locations for students. The website, although very large, had a logical system of links (Figure 1.9).

The screenshot shows the McGill University Student Information website. The main heading is "Where can I go?". Below this, there is a paragraph explaining that McGill maintains academic partnerships with a wide array of international institutions. A list of exchange partners is provided, categorized by region: Americas, Europe, Asia & Middle East, and Oceania. A note (N.B.) explains that the term "GENERAL" under the "FACULTY" column indicates that students from the McGill faculties of Agricultural and Environmental Sciences, Arts, Education, Engineering, Law, Management, Music, Religious Studies, and Science may apply. Check the host institutions' websites for restrictions.

The "Americas" section is expanded, showing a list of partner institutions. Below this, a table provides details for two partners:

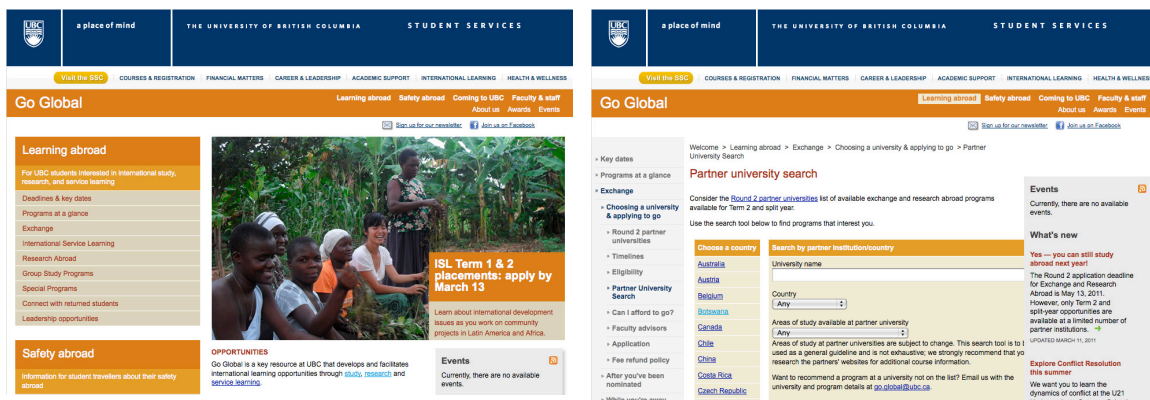
| Partner   | Faculty    | What other students said...               |
|---|------------|---|
| <a href="#">Torcuato di Tella, School of Business</a>     | Management | <a href="#">Experience Reports (.pdf)</a> |
| <a href="#">Universidad del Salvador (CREPUQ partner)</a> | General    |   |

Other countries listed under "Americas" include Brazil, Canada, Chile, Mexico, and United States.

**Figure 1.9: McGill student exchange information.**  
<http://www.mcgill.ca/students/international/studyabroad/partners/>, March 23, 2011.

## University of British Columbia (UBC):

UBC's international connections website, "Go Global", (Figure 1.10) was found to be one of the most complete. It had data or discussions for many of the topics being searched. The website itself was not linked from anywhere on the rest of the UBC network. During a thorough examination of the main UBC website, the only method found of navigating to the "Go Global" website was via a keyword search or previously knowing/bookmarking the web address.



**Figure 1.10: UBC's Go Global website.**  
<http://students.ubc.ca/global/index.cfm>, March 23, 2011.

## University of Guelph:

The University of Guelph had a very well designed system of dropdown menus which tied into an extensive database of study abroad programs (Figure 1.11).

The screenshot shows the University of Guelph Centre for International Programs website. At the top, there is a navigation bar with links: Home, About CIP, Guelph Students, Faculty & Staff, Safe Travel, Exchange Students, Partner Institutions, Publications, Important Dates, and Contact Us. Below the navigation bar is a calendar for March 2011. To the left of the main content is a sidebar with a login form (Username, Password, LOGIN) and a list of news items. The main content area is titled "Find a Study Abroad Program" and includes "Instructions for Using the Program Search". Below the instructions is a "PROGRAM SEARCH" form with dropdown menus for Regions (Asia), Countries (Select), SA Program Types (Exchange), Academic Programs (Select), and Start Month (Select). Below the search form is a table of search results.

| Name                                  | More Info               | Location  | Program Type | Semester Dates   | Notes                                  |
|---------------------------------------|-------------------------|---|--------------|--|--|
| <a href="#">Hong Kong Polytechnic</a> | <a href="#">more...</a> | City: Hunghom<br>Prov/States: Kowloon<br>Country: Hong Kong (PDR China)           | Exchange     | [September-January]<br>[January-June]<br>[July-August] | Limited to Hotel and Tourism students. |
| <a href="#">Lingnan University</a>    | <a href="#">more...</a> | City: Tuen Muen<br>Prov/States: New Territories<br>Country: Hong Kong (PDR China) | Exchange     | [September-December]<br>[January-May]                  | Courses taught in English              |

**Figure 1.11: University of Guelph dropdown menus.**  
<http://www.uoguelph.ca/cip/page.cfm?id=42>, March 22, 2011.

University of Alberta:

While the University of Alberta had an attractive website to discuss their international connections (Figure 1.12), international exchange data could only be found in a 21-page pdf file (University of Alberta, n.d.). Other than the pdf reader's search tool, the document necessitated the user to scroll through the document to retrieve the desired information.

**Figure 1.12: University of Alberta's Go Abroad website.**  
<http://www.international.ualberta.ca/goabroad/>, March 22, 2011.

University of California, Los Angeles (UCLA):

UCLA had an extensive database of international agreements utilizing a sortable table combined with a dropdown menu and search bar (Figure 1.13).

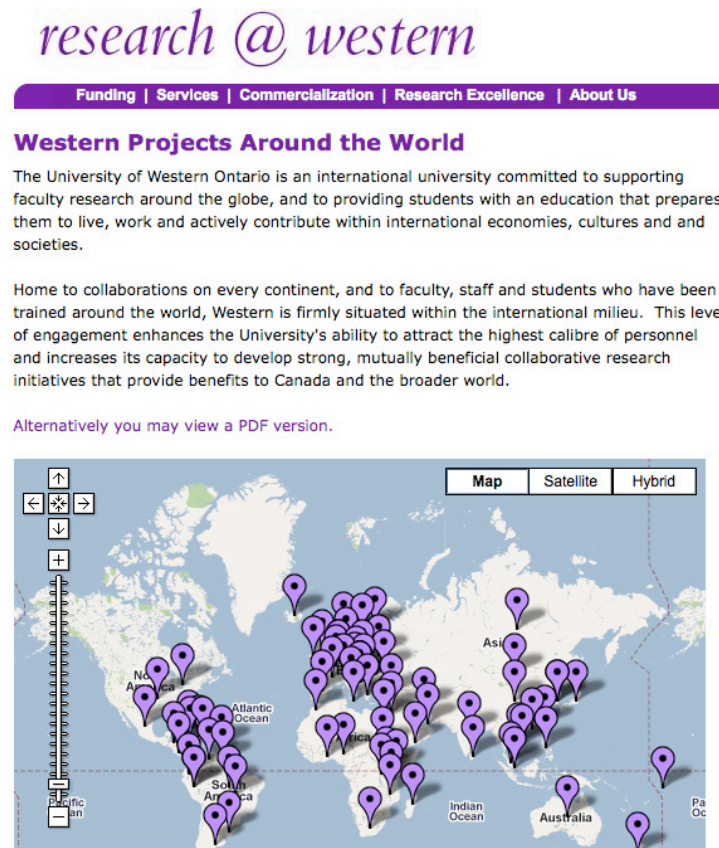
| Country   | Foreign Institution                     | UCLA Unit   | Duration    |
|-----------|---|---|-------------|
| Argentina | Belgrano University                     | Universitywide Education Abroad Program                 |             |
| Argentina | Universidad Torcuato di Tella           | School of Law   | 2009 - 2011 |
| Armenia   | State Engineering University of Armenia | Henry Samueli School of Engineering and Applied Science | 2007 - 2012 |
| Australia | Australian National University          | Universitywide Education Abroad Program                 |             |

**Figure 1.13: Database for UCLA.**  
<http://mou.international.ucla.edu/default.aspx>, March 24, 2011.

### 1.2.3.4.2 Examples of databases with maps

University of Western Ontario:

University of Western Ontario used a map to display research locations around the world (Figure 1.14).



**Figure 1.14: Map of research conducted at the University of Western Ontario.**  
<http://www.uwo.ca/research/map.html>, March 22, 2011.

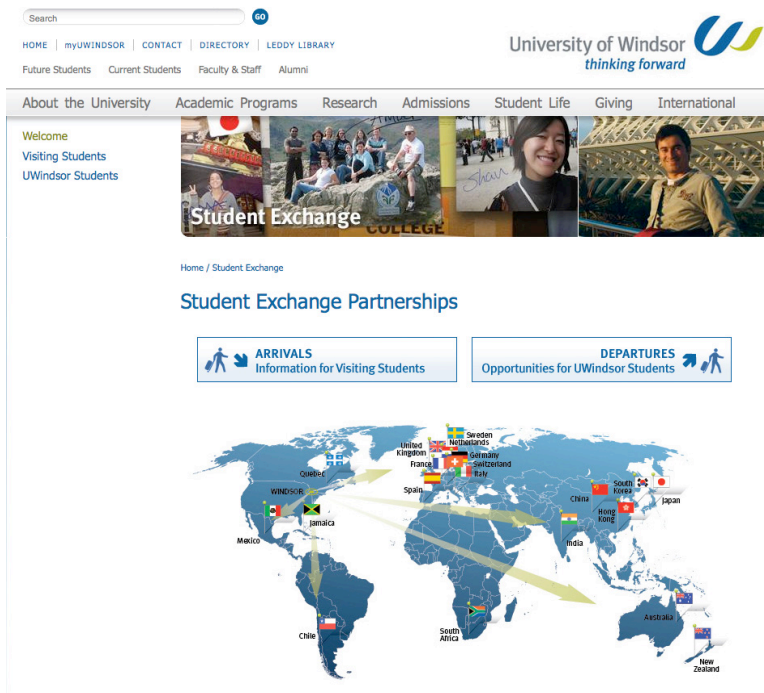
Clicking on a marker provided the name, email address and faculty/department of the researcher. Each marker indicated a country in which research was taking place, not the actual location of the research. This raised the issue that multiple researchers could be working in, or studying, a country but only one marker would be displayed. This gave that

country an equal visual weight to a country with only a single researcher. Other issues with this map included:

- Some continents had a marker, which appeared identical to a country marker. South America, for example, had a location marker in Brazil – giving Brazil two markers.
- Canada is given a marker listing two researchers. It can safely be assumed that a Canadian university would have more than two domestic researchers.
- No information was given as to the nature of the research. Other than the department or faculty of the researcher, it was left to the user to email the person to discover if the research is relevant to the user's interests.
- The map used a variation of the Mercator projection, which greatly exaggerates northern countries and the arctic, while diminishing equatorial areas. This issue will be discussed later in this chapter and illustrated in Figure 1.18.

University of Windsor:

This was a fairly typical map which uses the visual appeal of a map with very little of the functionality (Figure 1.15).



**Figure 1.15: Exchange locations of the University of Windsor.**  
<http://www.uwindsor.ca/studentexchange/>, March 22, 2011.

The issues with this map were:

- This map provided the geographic layout of the exchange locations (complete with large arrows radiating from Windsor), but did not support someone with little geographic knowledge. A user had to know where a country was on the map, or scan the entire map, to find his or her desired country – no parallel menu system or list was provided.
- The next issue was that the map is only used as a cover page. Once a country was chosen, these data were displayed as a linked table. The map disappeared, thereby not providing an actual map location of the exchange.
- Some countries linked to a table of exchange locations specific to that country, while other countries linked to a general, continent wide table. There was no indication of this on the map so, for example, clicking the Mexico flag brought up a list beginning with Chile because the table was for North, South and Central America.
- Another major issue was that two of the flags on the map were not countries. Hong Kong was given a separate flag from China and, more controversially, Québec is

given its own flag. Other countries with distinct nations such as Swansea University in Wales were not given separate flags.

One major positive of this map was that it uses a Robinson projection (Figure 1.15), which reduces the size distortions of the continents.

## Harvard University

Harvard University had one of the most extensive databases available online of any of the universities reviewed. The data were also searchable in multiple ways – geographically, through a selection of dropdown menus, and using keyword search tool (Figure 1.16).

The screenshot displays the Harvard Worldwide website interface. At the top, there is a navigation bar with links for 'Harvard Home', 'Site Map', and 'Contact Us'. Below this is a main navigation menu with categories: 'Welcome', 'Facts', 'Academic Activities', 'Prospective Students', 'Alumni & Friends', and 'Additional Resources'. The central focus is a world map using a Robinson projection, with a callout box highlighting the 'MIDDLE EAST AND NORTH AFRICA' region. To the right of the map is a search sidebar containing a search bar, radio buttons for 'Region' (selected) and 'Country', a dropdown menu for 'Select a Region...', and dropdown menus for 'Activity Type' (set to 'All Activities') and 'Schools' (set to 'All Schools'). There is also a 'Keywords:' input field and a 'Search' button. Below the search bar is an 'Advanced Search' link. At the bottom of the sidebar, there is a section titled 'Update Harvard Worldwide' with a link to 'Click Here'. Below the map, there are three columns of content: 'About this Site' (describing the site's design and maintenance), 'International Sites at Harvard' (listing various Harvard departments like Global Support Services, Business School, etc.), and 'Feature Story' (with a thumbnail image and a link to 'Read More').

**Figure 1.16: Opening map for Harvard University's mapping application.**  
<http://www.worldwide.harvard.edu/iws/>, March 23, 2011

There was one major failing with Harvard's mapping application. Similar to the issue with the University of Windsor map, the map on Harvard's website acts only as a cover page for the database. While the map persisted to the region level, it was not featured when the data on the international connections are actually being displayed. Therefore, the connections had no actual geographic location on the map; the map is simply a tool to narrow the search results. Other more minor issues with the application were:

- An issue with the map arose when some regions were chosen. As can be seen in Figures 1.16 and 1.17, the Middle East and North Africa region was selected, however, when the map automatically zooms, portions of the region were not visible.



**Figure 1.17: Middle East and North Africa map.**  
<http://www.worldwide.harvard.edu/iws/>, March 23, 2011

- The map used a variation of the Mercator projection, greatly exaggerating northern regions. For example, Greenland's area is actually almost the identical to Mexico or Saudi Arabia. See Figure 1.18.



**Figure 1.18: Portion of initial map on Harvard's mapping application highlighting the Mercator projection. <http://www.worldwide.harvard.edu/iws/>, March 23, 2011**

University of Oxford:

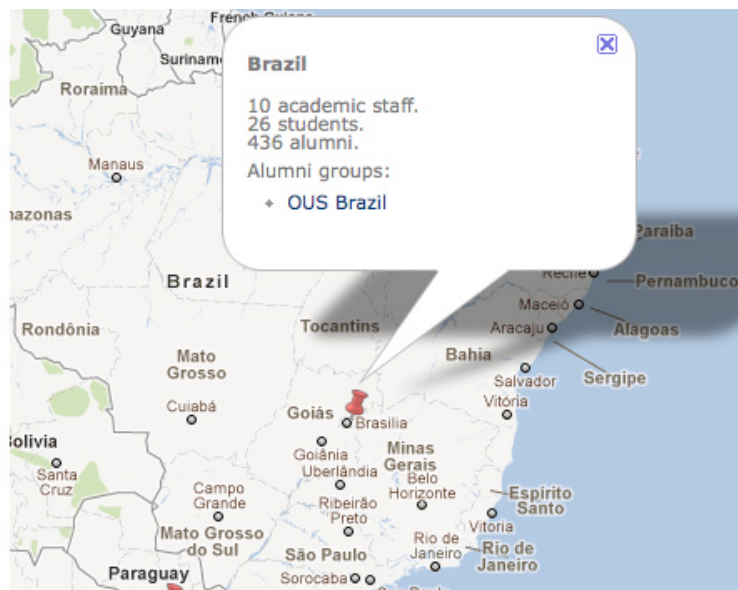
The University of Oxford had only a single map displaying any international connections. This world map displayed markers indicating which countries current staff and students came from and countries in which Oxford alumni currently lived (Figure 1.19).



**Figure 1.19: University of Oxford map displaying the source of current staff and students as well as homes of Oxford alumni.**

*[http://www.ox.ac.uk/international/oxford\\_around\\_the\\_globe/](http://www.ox.ac.uk/international/oxford_around_the_globe/), March 23, 2011.*

Clicking on a country's marker opened a bubble that indicated the number of staff, students, alumni, and a link to any alumni groups located in that country (Figure 1.20).



**Figure 1.20: Sample of information given for a country.**  
[http://www.ox.ac.uk/international/oxford\\_around\\_the\\_globe/](http://www.ox.ac.uk/international/oxford_around_the_globe/), March 23, 2011

There were a few issues with this map:

- When the website is opened, the map cropped northern Europe (including the word 'United' in Oxford's home country of United Kingdom), northern and eastern Asia, and the majority of North America (Figure 1.19).
- Similar to the University of Western Ontario, a marker could indicate one or multiple people connected to that country. A marker for a country with staff, students, alumni and an alumni group looked identical to a country with a single person.
- Also similar to the University of Western Ontario, the location of the marker within the country had no geographical bearing on the actual home location of any of the people or alumni group.
- Links were provided at the top of the map to zoom to regions of the map, however when some of these were chosen, the area displayed cropped significant portions of the region. For example, clicking Africa cropped North Africa enough that the markers for Morocco, Algeria and Tunisia were not visible.
- The vast majority of the markers were identical red pushpins, however blue pins are found in the United States (Figure 1.19). In the text above the map this was

explained, however there was no legend on the map to indicate that red=countries, blue=US states. This added level of detail is not utilized for other large countries such as Australia or Canada, despite both of these countries having thousands of connections and alumni branches located in each state and province respectively.

- All links found within a country's marker (for example the OUS Brazil link in Figure 1.20), were broken (at time of access).
- The final issue was more conceptual than technical. For the purpose of Oxford's map, a single alumni residing in a country is claimed by the university as a connection to that country. Other maps examined, for example Harvard's, designated a connection as being a more concrete tie, such as a university course, research subject, or a partner university.

#### Johns Hopkins University:

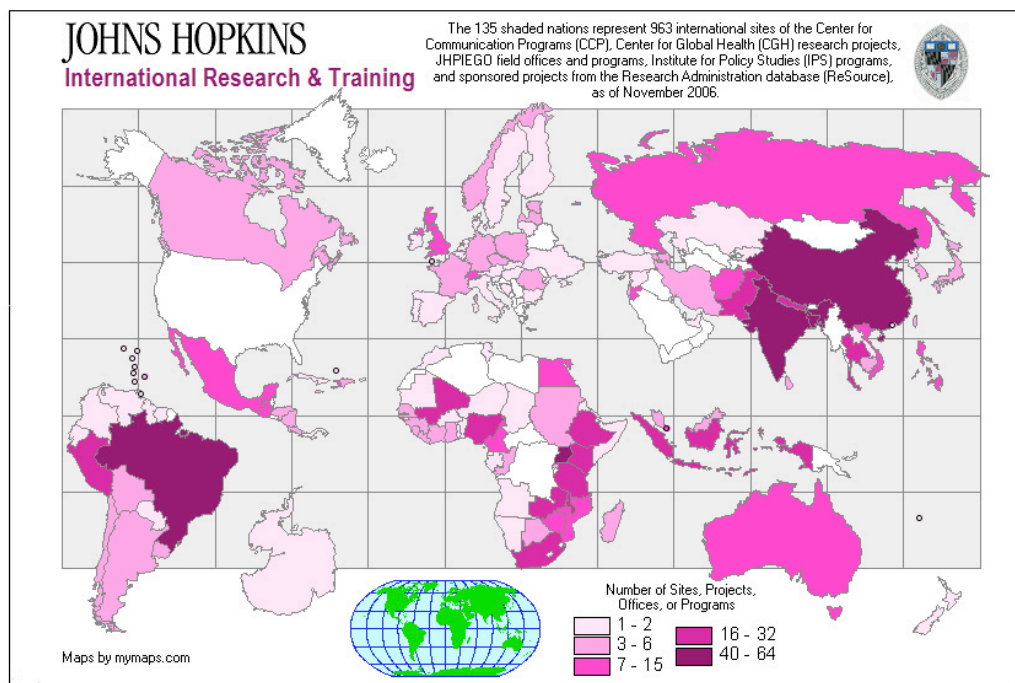
Johns Hopkins had one of the most powerful mapping applications, however it was tied to a relatively superficial database. The mapping application was one of the few to use a choropleth mapping technique to display the number of connections with a country (Figure 1.21). This technique uses a defined range of colours to indicate values for areas within the map.

## Johns Hopkins Around the World



### Global Data

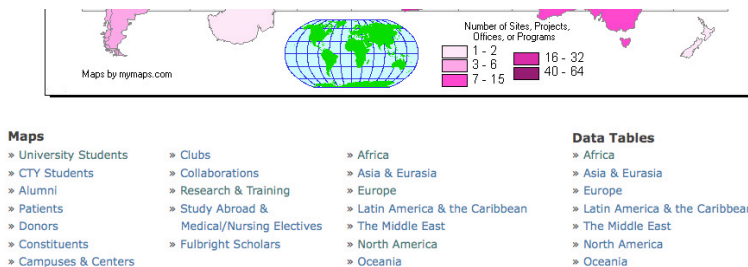
Scroll over the map below to view country names and data values, if applicable. Click on a nation to view data in all categories.



**Figure 1.21: Mapping application for Johns Hopkins University.**  
<http://web.jhu.edu/aroundtheworld/GJH/maps/ResearchTraining.html>, March 24, 2011.

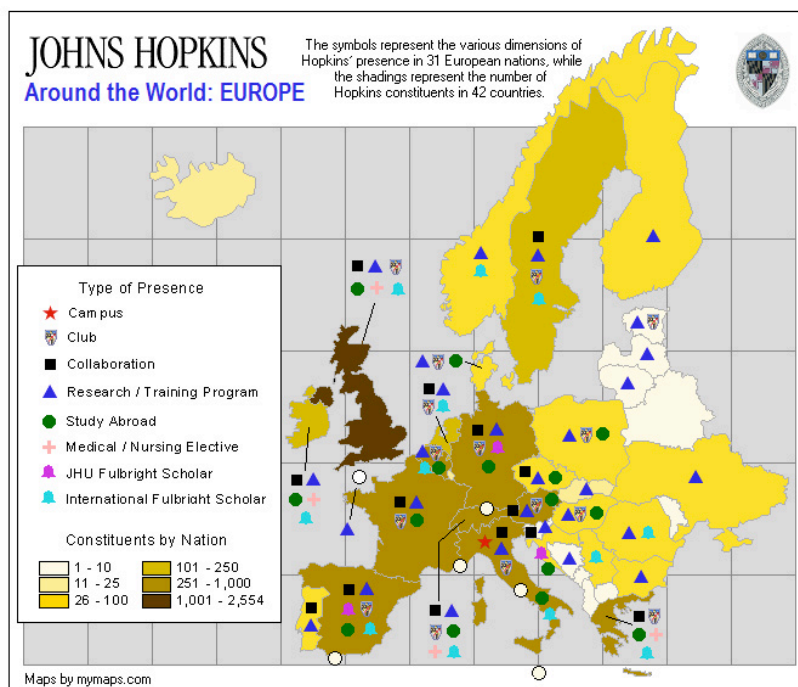
Johns Hopkins used a shading pattern and a legend to indicate the number of connections (of the chosen type) per country. Rolling over a country with the pointer also brought up a popup to display the number of connections.

This map also used an unusual map projection, with the continents separated and each projected differently in order to maximize the detail of each and minimize distortion. Links were provided at the bottom of the mapping application to display maps of other types of connections, or to isolate a continent (Figure 1.22).



**Figure 1.22: Links on Johns Hopkins University's mapping application for other maps and regions.**  
<http://web.jhu.edu/aroundtheworld/GJH/maps/ResearchTraining.html>, March 24, 2011.

If a continent was selected, a very detailed map was displayed with not only the choropleth showing the number of constituents, but also the types of connections found in each country (Figure 1.23). This was done through a series of symbols and a legend.



**Figure 1.23: Map of Johns Hopkins University's connections to Europe.**  
<http://web.jhu.edu/aroundtheworld/GJH/maps/Europe.html> March 24, 2011.

Issues with this application are:

- While each country could be clicked on to reveal detailed information on the connections located in that country, the map disappeared, removing the geographic

component. While the detail provided on the map made it far more than the glorified cover pages described in earlier examples, the maps could still be utilized more fully.

- Definitions for terms such as “constituents” were very difficult to find. There is no supporting document that defines all the terms in one location.
- The data provided at the deepest level (when a country is clicked on) were very superficial. Numbers of, for example, students, alumni, and donors, could be found, but there were no links to find more information on other displayed connections such as collaborations, study abroad opportunities, or satellite campuses. Also, the data tables referenced were not specific to that country, but rather part of a very long table containing all the other countries in the continent – and therefore took a while to load.

#### Cornell University:

Cornell University’s mapping application displayed five types of international connections including international research, student and faculty exchange locations, and international partners. These could be chosen using a dropdown menu above the maps. Each type of connection utilized a choropleth map to display the number of connections per country (Figure 1.24).

The screenshot displays the Cornell University International Gateway website. At the top left is the Cornell University logo and the text "Cornell University The International Gateway". To the right is a search bar with a "SEARCH:" label and radio buttons for "People", "Web", "VIVO", and "Advanced Search". Below the search bar are two columns of news and calendar items. The "International News" column lists articles such as "Malaria mosquitoes reveal pathogen defense strategies" and "Three Cornellians named Gates Cambridge scholars". The "International Calendar" column lists events for March 25th and 26th. To the right of these columns is a photograph of two women in traditional attire working on a red fabric. Below the news and calendar is a navigation bar with links for "Home", "Welcome from Alice Pell", "Cornell's International Mission", "How to use this site", and "PHOTO: Julia Dailey, Nepal". The main content area is divided into four sections: "Audience" (Browse by audience), "Global Cornell" (Browse by topic), "Travel Resources" (Consult before going abroad), and "International Insider" (Download our latest newsletter). Below these sections is the "International Research by Country" section, which features a world map and a "Select a map" dropdown menu. The map is currently showing a world view with a green overlay. To the right of the map is the "IN THE SPOTLIGHT" section, which features a "MEDEX Global Solutions Coming" announcement with a logo and text stating that Cornell is changing its international emergency services provider to MEDEX Global Solutions on March 18th.

**Figure 1.24: Cornell University's mapping application.**  
<http://www.international.cornell.edu/index.asp?map=4>, March 24, 2011.

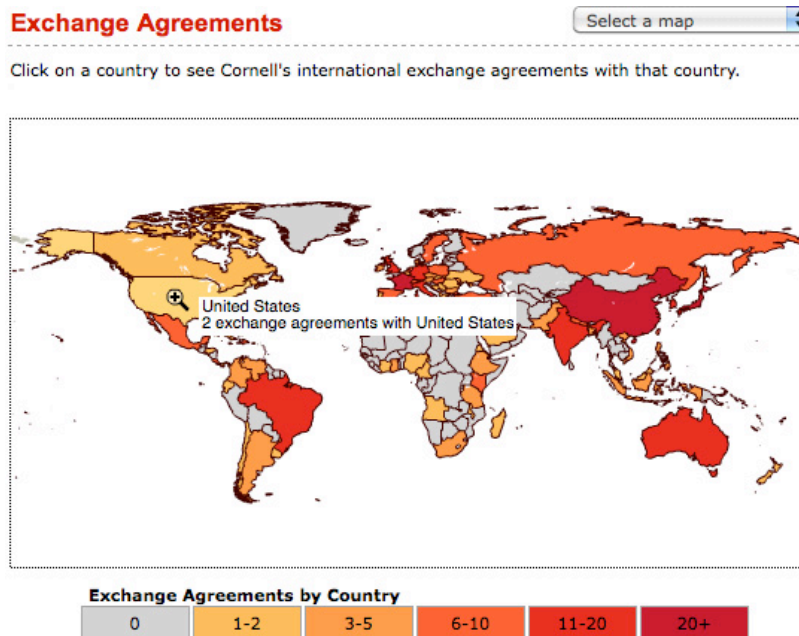
When a country was clicked on, the map zoomed in on the country and added an information document icon. Clicking the icon opened a data table listing all of that particular connection to the chosen country. This table was quite detailed and included the name of the person involved, their department or program, and the title of the project.

Issues with this application were:

- Similar to Johns Hopkins University, the connections had no location information displayed on a map.
- The map had no instructions and no zoom or pan functions. The map was relatively small on the page, making it very difficult to click on small countries. Clicking on a

nearby country would zoom the map and then allow the user to click on a neighbour.

- While popups with the country's name and number of connections appeared when a country was rolled over with the mouse, there were no tools in place to automatically zoom to a region or country. If a user did not know where a country was located, they were left to hunt for it on their own. If the country being searched for was very small, this could prove impossible.
- Despite the university being located in the United States, international connections were listed for the United States. For example, the map displaying Cornell's international exchange agreements (Figure 1.25) showed there to be two US connections, one of which was Michigan State University. Similarly, one international research travel grant recipient was listed as travelling to the United States, however the recipient actually travelled to American Samoa. While this is an unincorporated territory of the United States, Puerto Rico is as well and yet its connections were displayed separately from the United States.

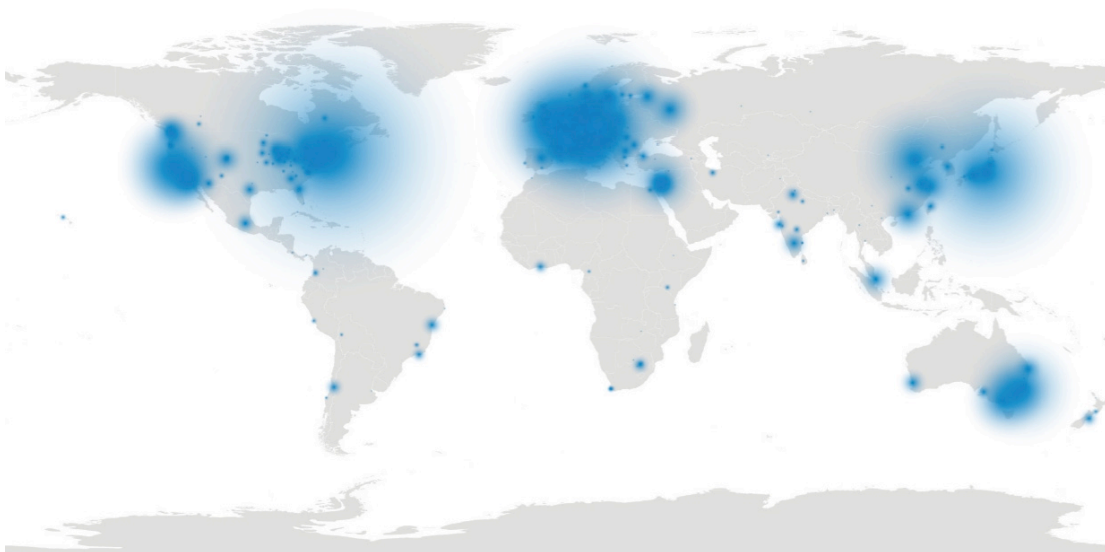


**Figure 1.25: Map of Cornell University's international exchange agreements.**  
<http://www.international.cornell.edu/index.asp?map=3>, March 24, 2011.

Swiss Federal Institute of Technology, Zurich:

The Swiss Federal Institute of Technology did not have an interactive mapping application, however they did have a very interesting static map to display their international research network (Figure 1.26). Using a system halfway between a dot density map (a technique whereby a dot is placed on the map to indicate the location of a defined value) and proportional symbols (a technique whereby a symbol is sized according to its value – a larger symbol indicates a higher value and vice versa), the map effectively displayed the actual location of the research as well as gave an idea of where the largest numbers of researchers were studying. Unfortunately there was no legend to fully explain what each dot meant, or what the relative sizes equaled, but it did provide an interesting visual.

#### ETH ZURICH IN THE GLOBAL UNIVERSITY LANDSCAPE INTERNATIONAL RESEARCH NETWORK



**Figure 1.26: Static research map for the Swiss Federal Institute of Technology, Zurich.**  
*[http://www.global.ethz.ch/research/map\\_research.jpg?hires](http://www.global.ethz.ch/research/map_research.jpg?hires), March 24, 2011.*

### 1.2.3.5 Conclusions and Best Practices

The critical review found there to be a wide variety of mapping applications, however no single university seemed to combine all the best aspects of an online map, and therefore all failed to capitalize on the potential. While Johns Hopkins University's application had a relatively well-designed mapping application, the database supporting the application was very superficial. Conversely, Harvard's database was very extensive and thorough, however the mapping application was simply used as a table of contents, with no information, values, or locations actually displayed on the map.

The major failing of all the mapping applications reviewed was that location data available for international connections were not utilized. For example, the University of Windsor's exchange university, Harvard's Internships and Study Abroad programs, and Johns Hopkins satellite campuses were all connections that had a very specific geographical location that could easily have been placed on their actual map location. Displaying all connections as a map location was not possible because many international connections were for a country as a whole. Therefore these did not have a physical location (for example, Harvard's PhD program in Celtic languages and literature was not specific to a single map location). In spite of this, having the map persist to the level of the database could have been a benefit to a user. For example, Harvard had summer programs in Oxford and Cambridge. If a map of the United Kingdom displayed simultaneously with the existing data listing, a user could see where in the United Kingdom they would be studying if one of these programs were of interest. As will be discussed in Chapter 4, almost 80% of the survey group preferred connections with a specific location to be displayed on a map.

## **2. Research Methodology**

### **2.1 Introduction**

This chapter presents the six stages of the UCD process followed in the course of this research. Designing an online mapping application for UVic required these stages to be modified slightly, with these modifications explained and supported after the description of the six stages.

### **2.2 Six stages**

The method of UCD being followed for this research used a six-stage iterative process. As described in the previous chapter, this was developed by Anthony Robinson and his colleagues (2005) (Figure 1.6) based on an earlier six-stage process suggested by Slocum et al. (2003) (Figure 1.5).

#### **2.2.1 Stage 1: Work domain analysis**

This stage is the beginning of any project – the client communicates the initial idea to the developer(s). In this case, UVic’s Office of International Affairs contacted the Department of Geography to find a potential developer for their idea. This portion of the work domain analysis stage will be discussed in Sections 3.4 – 3.6.

The primary purpose of this stage was to identify the potential users of the application and to begin collecting data regarding their usage and how a new tool would fit into their current regime. This data collection was accomplished through the use of a survey conducted in person and online. The work domain analysis portion of the survey

will be discussed in Section 4.2. The survey design will be discussed in Section 4.4, results discussed in Section 4.5, and the results analyzed in Section 4.6.

### **2.2.2 Stage 2: Conceptual development**

The goal of this stage is to identify desired features, layout, and the general architecture of the final product (Robinson et al., 2005). The conceptual development portion of the survey is discussed in Section 4.3. These data were collected simultaneously with the work domain analysis in the form of the survey. The reasons for combining these two stages are discussed in Section 2.3, while the results from this portion of the survey will be discussed in Section 4.5 and analyzed in Section 4.6. This stage of the design process is the beginning of the iterative stages of UCD.

### **2.2.3 Stage 3: Prototyping**

The development of a working prototype based on the findings of stages one and two is critical to UCD as it provides a tool from which users can give further input. This stage is discussed in Chapter 5.

### **2.2.4 Stage 4: Interaction and usability studies**

This stage is dependent on focused trials with potential users to assess the success of the prototype at meeting their needs. To accomplish this, interviews were conducted with a representative sample of users. As identified by Robinson et al. (2005), recording all input, suggestions, and difficulties encountered by the test group is an important part of the usability assessment. While this was originally planned to be conducted in a workshop setting with a group of participants, time and concerns about the willingness of

participants to attend, forced it to be adapted into a series of interviews. This stage is discussed at length in Chapter 6.

### **2.2.5 Stage 5: Implementation**

Implementation is the final stage of the iterative portion of the design process. Because implementation will often cause new issues to arise, any potential solutions should be returned to the users, tested and then implemented. Some implementation occurs immediately upon receiving feedback during the interaction/usability assessment stage, however some implementations could require major changes to the product. When possible, changes were implemented immediately after receiving the feedback from a user. This research, however, did not focus on making the product conform to the standards and templates in use by UVic and therefore some of implementations are discussed in Chapter 7 under future research.

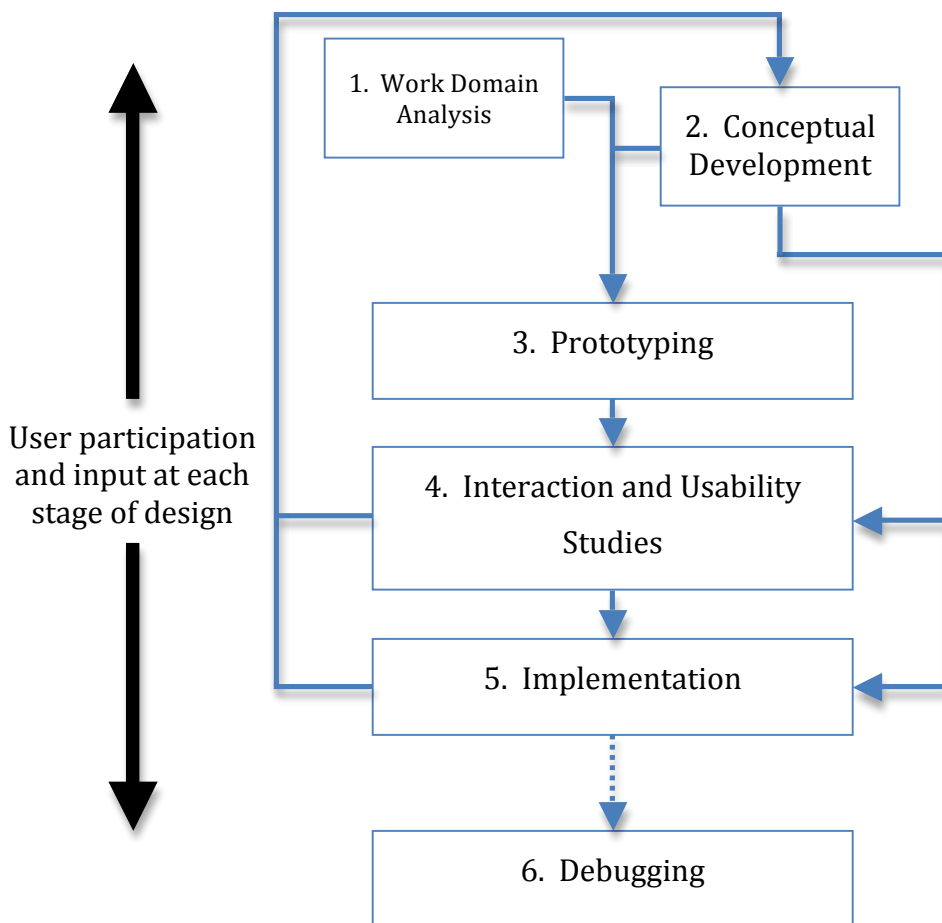
### **2.2.6 Stage 6: Debugging**

Debugging can be an ongoing process that continues for as long as the product is in use. Ensuring the necessary stability and compatibility is critical to continued use of the product. To maintain feedback from the users, methods such as user surveys, feedback forms, or issue tracking software can be used (Robinson et al., 2005). This stage would need to be undertaken by UVic and is discussed in Chapter 7.

## **2.3 Stage modifications**

The six stages outlined above were modified to fit this research (Figure 2.1) by conducting the work domain analysis in conjunction with the conceptual development

stage. The reasons for this are as follows. Because an in-person analysis of the workplace and tool usage was not possible, combining the two stages of data collection into a single survey was advantageous due to the reduction of time required of the users and also because of expected falloff of participation if responses to successive surveys were requested.



**Figure 2.1: Illustration of modified six-stage process followed for this research.**

In-person analysis was not possible primarily because there was no defined user group for a new mapping application. For some software development, particularly in cases where a new version of existing software is being developed, the recipients can be targeted very accurately and very focused studies on their work habits and tool usage can

be conducted. In this research, the group of potential users, including prospective international students, was very broad and could only be hypothesized. Because of this, a very wide-reaching survey was designed in an attempt to capture input for all possible interested parties. While it was recognized that potential users may include people outside the university population, time constraints dictated the reliance on the snowball method to reach people, implying that the survey would capture primarily individuals working in or somehow already affiliated with UVic.

As stated above, the work domain analysis and the conceptual development stages were combined to streamline the development process as well as to reduce the potential drop off in the level of participation that would likely result from conducting two surveys on the same audience. The survey was designed to collect data for both stages while maintaining a reasonable completion time and degree of interest. The survey is discussed in Chapter 4 and can be viewed in Appendix J.

### **3. University of Victoria Case Study**

#### **3.1 The Beginnings**

The then Dean of Graduate Studies, Dean Aaron Devor, was the first to suggest the idea for a new mapping application for UVic to communicate international activities. His idea was adopted by Prof. Jim Anglin in UVic's Office of International Affairs (OIA), working under the then Vice President, Academic and Provost (VPAC), Prof. Jamie Cassels. OIA's focus on UVic's international connections was a natural fit for the production of a new tool to highlight the university's global reach. The idea was to display all of UVic's connections on two maps. The first would show the locations of connections such as research sites, exchange locations, partner universities, and co-op opportunities on a world map. The second map would show the UVic campus, allowing a user to examine each faculty, department, research group and student service to see how each is connected to the world.

#### **3.2 Harvard University Mapping Application**

The initial idea was the result of Dean Devor seeing an application in use by Harvard University (reviewed in Section 1.2.3.4.2). This system used a clickable map allowing the user to zoom into eight regions in the world. Once a region was isolated, a single country could be chosen. When a single country was selected, the map disappeared and an itemized list of the activities present in that country was provided. From there, specific activities could be chosen and details could be retrieved. As an alternative to the map, dropdown menus, a keyword search box, and an advanced search were provided.

### **3.3 Initial Contact**

UVic's Office of International Affairs contacted UVic's Department of Geography in October 2009 to determine if a similar product could be designed for UVic. It was at this point that this researcher became involved. After examining the Harvard product and meeting with the Department of Geography's cartographer, Ken Josephson, and with one of the Department's geomatics and cartography instructors, Dr. Ian O'Connell – a member of the researcher's graduate committee, it was quickly realized that the Harvard model did not maximize the potential of displaying international connections geographically. Because the map disappeared so quickly into the search process, the potential for a very visual product was negated.

The initial needs identified by the OIA offered a lot of flexibility in the design. The goals were to create a very visual method of presenting the university's connections, have the capability of updating the data, and to have it operational by January 29, 2010. The strict timeline was so that a map could be presented at a university leadership conference being held for the university administration. At this stage the Dean of Social Sciences, Prof. Peter Keller was brought into the discussions given his extensive background in cartography, cartographic design and decision support, and given his connections into administration at UVic.

### **3.4 Platform**

The limited visuals in the Harvard design gave a lot of room for improvement by keeping the map as the main focus for the application. During the first meeting between Ken Josephson, Patricia Maedel of OIA, and the researcher, an alternative was suggested

whereby the mapping application would be based on a system already being utilized by the UVic community map and other community mapping initiatives in the Victoria area. This system is a Drupal-based application using georeferenced icons to display data on a Google Map™. This platform is discussed in more detail in Section 5.2.

The big difference between this system and a standard Google map is that the software has a pre-established system of managing contributors. Accounts can be created to allow multiple system administrators, but more importantly, lower level accounts can be created to allow new content to be added in a controlled, supervised manner. These lower level accounts can have strict limits put on their ability to edit existing content or to edit the overall map and website. The big advantage over other software platforms is that the community mapping system (UVic Community Mapping Initiative, 2011) was already in place and so needed only limited development and coding. Entering the data and manipulating the layout to fit the requirements could be done within the existing framework without requiring a new system to be developed or purchased.

### **3.5 Data**

The major challenge identified in the first meetings with OIA was compiling the data to be presented. In the timeframe available, it would not be possible to collect data from all across campus including every faculty and department. With the help of a co-op student working in the OIA, they were able to pull information from the university website with particular focus on the Faculty of Business, Co-Op, and the Centre for Asia Pacific Initiatives (CAPI). The researcher also employed locational data pertaining to current research sites by Geography faculty members as well as research being conducted by graduate students

in Geography. Data thereby collected included partner universities, co-op locations, exchange locations, and research sites.

The prototype was presented on January 29, 2010. Although some bugs were identified and some improvements needed, it was well received by the university administration. This prototype can be found at: <http://mapping.uvic.ca/international>.

### **3.6 Connection to the research**

The prototype developed for OIA presented a valuable avenue for research. However the timeline presented an impossible challenge to actually incorporate the research prior to it being presented. In essence, the prototype being presented followed the “prototype first” model of UCD (Roth et al., 2010; Slocum et al., 2003) where an expert designs the prototype with little to no data on the identity of the users, how the tool would be incorporated into their work, and what features are desired or disliked.

With the time constraints to developing a prototype, tying it into the research could be done in two ways. First, a modified version of Robinson’s (2005) six-stage UCD process could be used. This would look similar to Roth et al.’s (2010) approach, described in Chapter 1. This approach would have a prototype developed prior to any user work domain analysis with the aid of some usability studies with available designers, stakeholders and users. Further development, interaction and usability studies would then occur afterwards with a work domain analysis, conceptual development and implementation. However as discussed in Chapter 1, this approach can severely limit the initial ideas and input from users because their opinions can be influenced by the prototype.

With these limitations in mind, the decision was made to abandon the prototype already developed and to commence a standard UCD process from the beginning following the modified Robinson et al. (2005) approach described in Chapter 2.

The knowledge gained during the design of the earlier prototype would be used if applicable. Similarly, the data previously collected would form the basis for the new prototype. During the work domain analysis and future interactions with users, the researcher was careful to not include screenshots or references to the initial prototype in order to minimize its influence. Some of the people surveyed attended the leadership conference at which the prototype was presented. It is unknown how much exposure to the original prototype influenced their responses.

## **4. User-Centered Design Stages One and Two (Work Domain Analysis and Conceptual Development)**

### **4.1 Work Domain Analysis**

The primary goals of this stage of UCD are to understand the client(s) ideas and requirements for the project, and to develop an understanding of the potential users of the project. As stated by Gabbard et al. (1999) a work domain analysis

“is the process of identifying a complete description of tasks, subtasks, and methods required to use a system, as well as other resources necessary for user(s) and the system to cooperatively perform tasks” (p. 53).

The importance of interactions with the client was introduced in Chapter 3. Collecting data regarding the potential users of this mapping application is recognized to be challenging given that the users could come not only from anywhere within the university population, but also from anywhere in the public at large. This makes it different from other software development where the group of users is often a well-defined and tightly bounded group.

Seven groups of potential users were identified for the mapping application under consideration:

Group 1: Administration

Group 2: Staff

Group 3: Faculty

Group 4: Graduate students

Group 5: Undergraduate students

Group 6: Alumni

Group 7: Public

Because of the diversity of the potential users, collecting work domain analysis data would be nearly impossible if conducted in person. It was determined, therefore, that a mixed survey approach would be the most effective method of reaching as many people as possible. The population of potential participants in groups one (administration) and two (staff) is relatively small compared to other groups. These two groups therefore could be surveyed in person using the same survey tool, with the researcher asking the questions and taking notes of answers. The remaining groups were judged too large to sample and interview in person. A decision was made to develop an online survey for these groups, and to reach out to this membership using below recruitment strategies to secure voluntary participation in the study.

The methods for recruiting were as follows.

#### **4.1.1 Group 1 and 2: Administration and staff**

The researcher compiled a list of potential participants with input from his Committee. Contact information was collected from UVic's public website. Potential participants were emailed information about the research (Appendix D) as well as receiving a participant consent form (Appendix C). Thirty-minute meetings were scheduled with respondents to conduct the survey.

#### **4.1.2 Group 3: Faculty**

Emails were sent to UVic faculty and department secretaries with information about the research (Appendix D) and information about how to access the online survey (Appendix H) with a request for them to forward the information to people within their faculty or departments. This did not prove to be very successful as many departments try

to limit the amount of unsolicited emails being sent to their faculty members. In these cases, it was requested that the information brochure (Appendix H) be posted in the department.

#### **4.1.3 Group 4: Graduate students**

Emails were sent to graduate secretaries of UVic faculties and departments with a similar information package as the Group 3 participants with the request that the information be forwarded to graduate students within their faculty or department. Some of these requests were denied for the same reason identified above, however some were successful. Some secretaries also voluntarily printed copies of the promotional flyer (see Appendix H) to make available to anyone interested. One graduate class presentation, as described in the Group 5 recruitment method, was also conducted.

#### **4.1.4 Group 5: Undergraduate students**

Faculty members teaching courses with a focus on either maps or on an international course subject were contacted with a request for a couple minutes of class time in which the researcher could explain the project and ask for participation. Flyers were left for the students (Appendix H). Presentations were made in two undergraduate classes and were reasonably successful at soliciting participation. A script for the presentations can be seen in Appendix E.

#### **4.1.5 Group 6: Alumni**

Recruiting alumni proved to be impossible. While the hope was that an email could be sent out by UVic Alumni Services using their alumni contact information, overcoming

their reservations about unsolicited emails being sent was not possible. Any alumni participation was therefore a result of the snowball method, or by an alumni also being a participant in another group identifying themselves primarily as alumni, rather than a member of that other group.

#### **4.1.6 Group 7: Public**

No direct recruitment of the public was conducted. All groups were encouraged to invite others to participate in the online survey, so any public participation was due to a snowball method.

## **4.2 Conceptual Development**

Another goal of the survey was to determine key features desired by users and to collect feedback on layout, architecture, and platform for a new application. This was mostly completed through questions on existing mapping systems and through general questions of user preferences.

## **4.3 Survey Design**

The survey was designed to complete stage one and the beginning of stage two in Robinson et al.'s (2005) six-stage UCD process. The primary goal was to complete a work domain analysis of potential users and to identify some desired features, and to collect feedback on the layout, architecture and platform. While very detailed data were desired, the necessity of an online survey required it to be relatively short in order to ensure it was not abandoned before completion. The goal was to limit the response times to approximately ten minutes. Using Mayhew's (1999) topics for requirements analysis,

design and testing tasks (Table 4.1), questions were designed to collect the maximum amount of information in the fewest questions and shortest time.

**Table 4.1: Select topics identified by Mayhew (1999) for requirements analysis, design and testing tasks during UCD product design.**








- User profile
- Platform capabilities/constraints
- General design principles
- Conceptual model design
- Conceptual design mockups
- Screen design standards
- User feedback

The order of the questions was designed to initially capture a respondent's interest with questions about the project and about maps before asking more detailed questions about their design requirements, technical knowledge, workstation, and finally response group/profile. The full survey can be seen in Appendix J. The survey was designed using FluidSurveys.com (<http://www.fluidsurveys.com>).

#### **4.4 Survey response rate**

The survey was conducted between November 2010 and February 2011. On November 2, an invitation email was sent to 262 people. The basic profile of the survey respondents can be seen in Table 4.2. The number of responses per question varied between 101 and 103. The numbers of respondents from each group met the expectations of the researcher and the Committee.

**Table 4.2: Responses to the question “In which group do you consider yourself to be?”**  
*Note: only one answer was allowed.*

| Response               | Chart   | Percentage | Count      |
|------------------------|---|------------|------------|
| Administration         |  | 6%         | 6          |
| Staff                  |  | 8%         | 8          |
| Faculty                |  | 12%        | 12         |
| Graduate Students      |  | 36%        | 37         |
| Undergraduate Students |  | 25%        | 26         |
| Alumni                 |  | 7%         | 7          |
| Public                 |  | 6%         | 6          |
| <b>Total Responses</b> |   |            | <b>102</b> |

## 4.5 Analysis of Results

The analysis of the results will not follow the order of the questions in the survey. The questions asked as part of the work domain analysis will be analyzed first, followed by questions concerning the conceptual development stage. Appendix K gives the complete survey results to allow the reader to browse findings quickly and sequentially without the researcher’s interpretations. What follows is an interpretation and commentary on the results with findings shown in Appendix K repeated as judged appropriate.


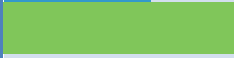
### 4.5.1 Computer systems

A series of questions determined what type of computer, size and monitor configuration the respondents were typically using. These questions allowed for more than one answer. This allowed people to report where they may use a different configuration at work versus at home, or in their office versus while travelling. Table 4.3 gives responses. This portion of the survey was undertaken and is included because it was hypothesized that general market statistics would not be representative of the university community

interested in this type of product. Market statistics shown in Tables 4.4 and 4.5 suggest that 82% of respondents would be expected to use the PC environment, with Internet explorer the most popular browser. The survey revealed the number of PC users to be much lower at 68% of those sampled, confirming the hypothesis.

This research therefore should not make the assumption that the community interested in the mapping application under consideration here conforms to the general statistics about users of operating systems and web browsers.

**Table 4.3: Responses to the question “Do you use a Mac or a PC?”**  
*Note: respondents were allowed to choose more than one response.*

| Response               | Chart   | Percentage | Count      |
|------------------------|---|------------|------------|
| Mac                    |  | 43%        | 44         |
| PC                     |  | 68%        | 69         |
| <b>Total Responses</b> |   |            | <b>102</b> |

**Table 4.4: Latest market statistics comparing Windows versus Mac operating systems.**

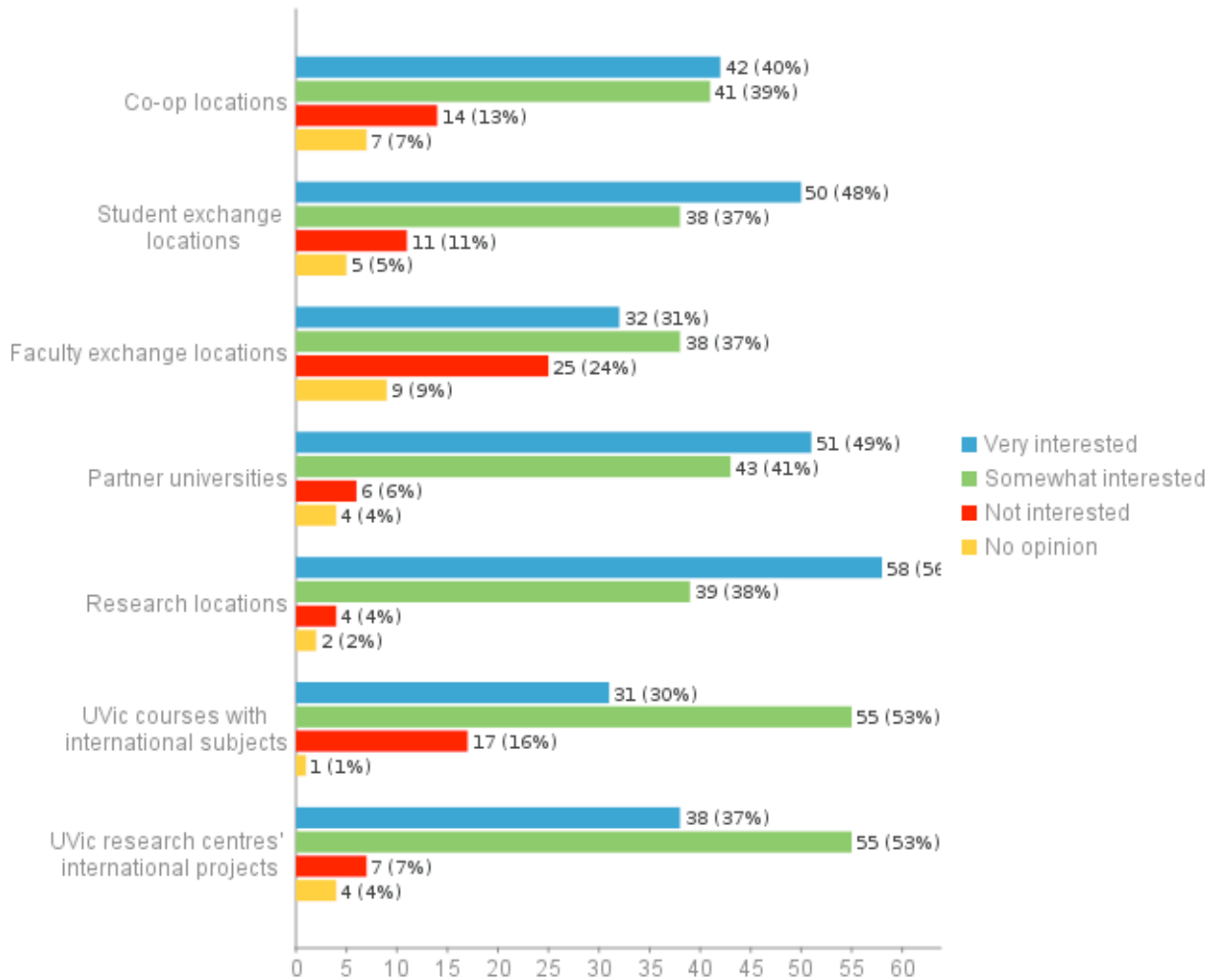
| Source                          | Date      | Microsoft              |             | Apple       |             |
|---------------------------------|-----------|------------------------|-------------|-------------|-------------|
|                                 |           | Windows (all versions) | Mac OS X    | iOS         | Other       |
| AT Internet (2011)              | Aug. 2011 | 87.1%                  | 6.7%        | 3.7%        | 2.5%        |
| Clicky Web Analytics (2011)     | Oct. 2011 | 79.5%                  | 13.2%       | 3.8%        | 3.4%        |
| Chitika (2011)                  | Oct. 2011 | 77.2%                  | 10.2%       | 5.4%        | 7.2%        |
| Net Market Share (2011)         | Oct. 2011 | 86.5%                  | 6.5%        | 3.4%        | 3.5%        |
| StatCounter Global Stats (2011) | Oct. 2011 | 84.6%                  | 6.7%        | 2.6%        | 6.2%        |
| StatOwl (2011)                  | Oct. 2011 | 78.9%                  | 14.0%       |             | 7.0%        |
| W3Counter (2011)                | Oct. 2011 | 80.2%                  | 8.9%        | 3.2%        | 7.7%        |
| Webmasterpro (2011)             | Nov. 2011 | 85.8%                  | 6.3%        | 4.4%        | 3.5%        |
| Wikimedia (2011)                | Oct. 2011 | 78.4%                  | 8.4%        | 5.1%        | 8.1%        |
| <b>Mean</b>                     |           | <b>82.0%</b>           | <b>9.0%</b> | <b>4.0%</b> | <b>5.5%</b> |

**Table 4.5: Market statistics of browser usage for December 2011.**

| Source                  | Internet Explorer | Chrome       | Firefox      | Safari      | Opera       | Other       |
|-------------------------|-------------------|--------------|--------------|-------------|-------------|-------------|
| Statcounter (2011)      | 38.7%             | 27.3%        | 25.3%        | 6.1%        | 2.0%        | 0.6%        |
| Net Applications (2011) | 51.9%             | 19.1%        | 21.8%        | 5.0%        | 1.7%        | 0.5%        |
| W3Counter (2011)        | 31.2%             | 23.8%        | 25.5%        | 6.3%        | 2.6%        | 10.6%       |
| Clicky (2011)           | 40.0%             | 25.0%        | 24.5%        | 9.2%        | 1.3%        | 0.0%        |
| <b>Average</b>          | <b>40.5%</b>      | <b>23.8%</b> | <b>24.3%</b> | <b>6.7%</b> | <b>1.9%</b> | <b>2.9%</b> |

#### 4.5.2 Level of interest in UVic's international connections

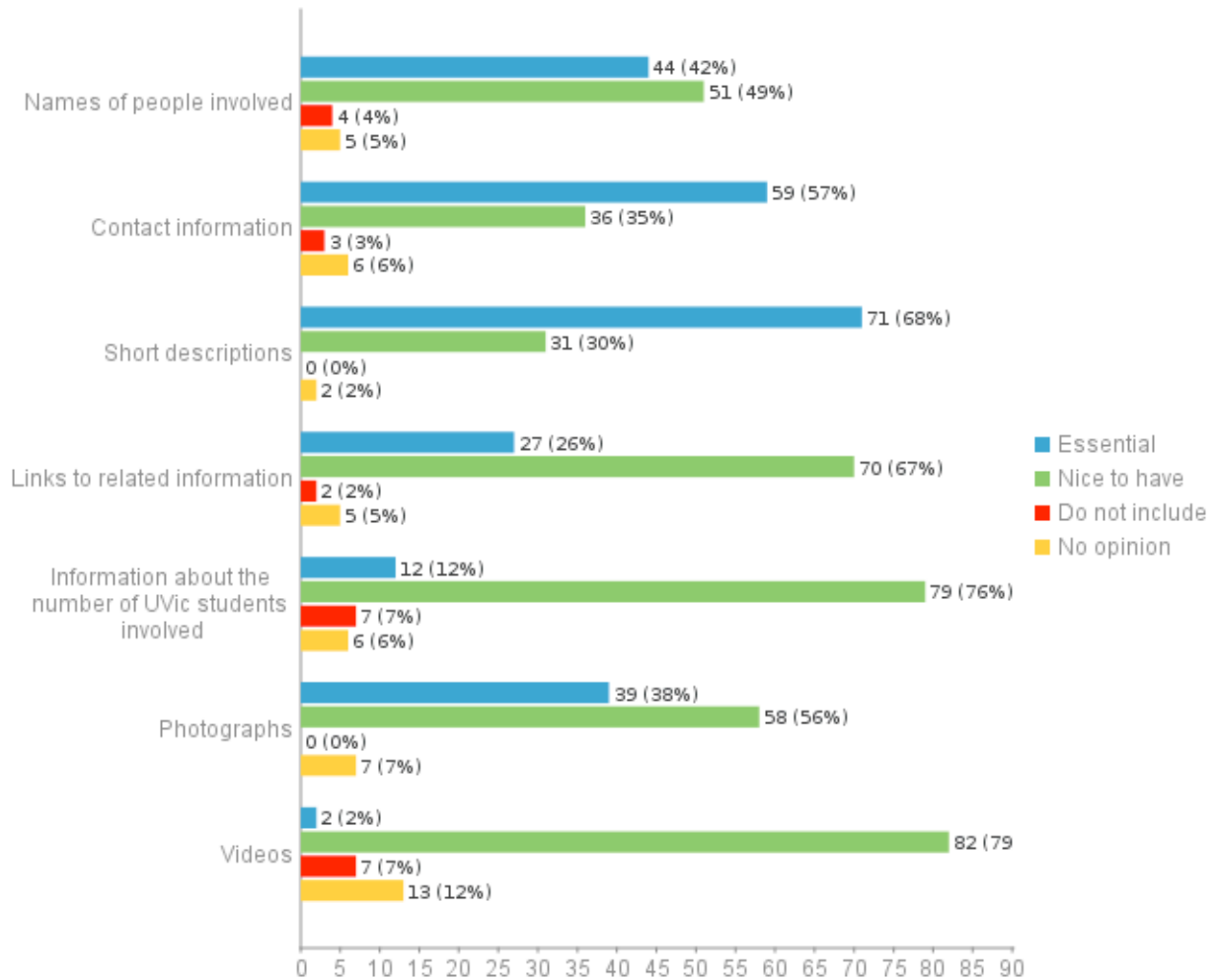
The first question respondents were asked was to indicate their level of interest in a series of possible international connections (Figure 4.1). "Very interested" or "somewhat interested" were always the top response, with approximately 80-90% of respondents choosing one of these two responses. The exception was the interest in "faculty exchange locations" where only 68% were "very interested" or "somewhat interested". This comparative lack of interest can easily be explained by the predominance of students within the respondents (Table 4.2). The generally high level of interest was expected because of the voluntary nature of the survey.



**Figure 4.1: Responses to the question “How interested are you in each of these types of connections?”. See Appendix J for the layout of the question.  
Note: only one answer was allowed per connection type.**

Similarly, respondents were very interested in having “detailed” information available about the international connections (Figure 4.2). “Short descriptions” and “contact information” were the most desired inclusions with the majority of respondents selecting them as “essential”. Of these, “short descriptions” was the most desired, with 68% indicating it as “essential”, 30% as “nice to have” and zero as “do not include”. This is particularly interesting because of all the university mapping applications reviewed (see Section 1.2.3), only Harvard University provided this level of information. While

respondents generally wanted all types of information, it is interesting to note that “information about the number of UVic students involved” and “videos” had significant amounts of “do not include” and “no opinion”. During the in person surveys and the follow-up interviews (discussed in Chapter 6), it was clear that this was due to privacy issues and load time issues. “Videos” in particular had only 2% of respondents indicating this as “essential”. One method of satisfying all respondents for this requirement would be to allow the inclusion of links to YouTube™, or other media sharing websites, rather than having the videos hosted directly in the mapping application.



**Figure 4.2: Responses to the request to “Use the scale “Essential”, “Nice to have”, “Do not include”, or “No opinion”, to rank how important the inclusion of each of the following is to the connection being mapped.” See Appendix J for the layout of the question.**

*Note: only one answer was allowed per type of information to be included.*

### 4.5.3 Participants’ use of maps

The next series of questions asked respondents about their use of maps and map preferences (Tables 4.6, 4.7, and 4.8). All but one respondent indicated that they “regularly use a map as a source of information” with the majority indicating these are online maps or atlases, rather than paper maps or atlases. This familiarity with online maps was also reflected in questions about their preferred method of retrieving information about

international connections, and a scenario-type question where a choice was given between a visual map and a series of written instructions.





**Table 4.6: Responses to the question “Do you regularly use a map as a source of information?” See Appendix J for the layout of the question and accompanying visuals.**

*Note: only one answer was allowed.*

| Response | Chart   | Percentage             | Count      |
|----------|---|------------------------|------------|
| Yes      |  | 99%                    | 101        |
| No       |  | 1%                     | 1          |
|          |   | <b>Total Responses</b> | <b>102</b> |




**Table 4.7: Responses to the question “If you were interested in finding all of UVic’s Geography department research sites in Thailand, what would be your preferred method for retrieving this information?” See Appendix J for the layout of the question and accompanying visuals.**

*Note: only one answer was allowed.*

| Response         | Chart   | Percentage             | Count      |
|------------------|---|------------------------|------------|
| Data table       |  | 5%                     | 5          |
| Dropdown menus   |  | 16%                    | 16         |
| Markers on a map |  | 77%                    | 79         |
| No opinion       |  | 3%                     | 3          |
|                  |   | <b>Total Responses</b> | <b>103</b> |

**Table 4.8: Responses to the question “If you were driving to an unfamiliar location, which would you prefer to use?” See Appendix J for question layout and accompanying response visuals.**


*Note: only one answer was allowed.*

| Response             | Chart   | Percentage             | Count      |
|----------------------|---|------------------------|------------|
| Written directions   |  | 17%                    | 18         |
| Map with drawn route |  | 79%                    | 81         |
| No preference        |  | 4%                     | 4          |
|                      |   | <b>Total Responses</b> | <b>103</b> |

When asked about the appearance of the map, users strongly indicated that a choice should be provided by the mapping application (Table 4.9). This would allow users to switch between a traditional map and a map based on a satellite image. When it came to map projections, two thirds indicated they knew what this meant (Table 4.10), and a similar percentage indicated that they preferred a Robinson style projection of the world to a Mercator projection (Table 4.11). This is particularly interesting because with 78% of respondents indicating a preference for online maps over paper maps, and with the vast majority of online maps being based on a Mercator projection, these users prefer something different, but are still content enough with the Mercator projection to continue using the online maps. The predominance of the Mercator projection may make it more difficult to use anything else for a new product, but either a Robinson-styled projection should be used, or the framework should allow for this projection to be incorporated in the future.



**Table 4.9: Responses to the question “If you were to use a world map, which type do you prefer?”**  
**Choice 1 was a traditional map and choice 2 a satellite hybrid map. See Appendix J for the layout of the question and accompanying visuals.**

*Note: only one answer was allowed.*

| Response                                    | Chart   | Percentage             | Count      |
|---|---|------------------------|------------|
| Choice 1                                    |  | 20%                    | 21         |
| Choice 2                                    |   | 17%                    | 18         |
| The application should give me both choices |   | 57%                    | 59         |
| No opinion                                  |   | 5%                     | 5          |
|   |   | <b>Total Responses</b> | <b>103</b> |


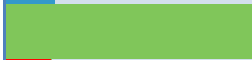

**Table 4.10: Responses to the question “Do you understand what is meant by a map projection?” See Appendix J for the layout of the question and accompanying visuals.**

*Note: only one answer was allowed.*

| Response | Chart   | Percentage             | Count      |
|----------|---|------------------------|------------|
| Yes      |  | 67%                    | 68         |
| No       |  | 33%                    | 33         |
|          |   | <b>Total Responses</b> | <b>101</b> |

**Table 4.11: Responses to the question: “Which of the following images of the world would you most prefer for the world map?” See Appendix J for the layout of the question and accompanying visuals.**

*Note: only one answer was allowed.*

| Response        | Chart   | Percentage             | Count      |
|-----------------|---|------------------------|------------|
| Square version  |  | 15%                    | 15         |
| Rounded version |  | 72%                    | 74         |
| No opinion      |  | 14%                    | 14         |
|                 |   | <b>Total Responses</b> | <b>103</b> |

#### 4.5.4 Interactive maps

The next series of six questions built on the research by Hegarty et al. (2009) in their study of user approaches to interactive maps. While their survey had seventeen questions, this was reduced to six to shorten the time requirements (Table 4.12).

**Table 4.12: Responses to a series of statements. Statements are listed with the corresponding counts and (percentages) for each degree of agreement or disagreement. See Appendix J for the layout of the question.**

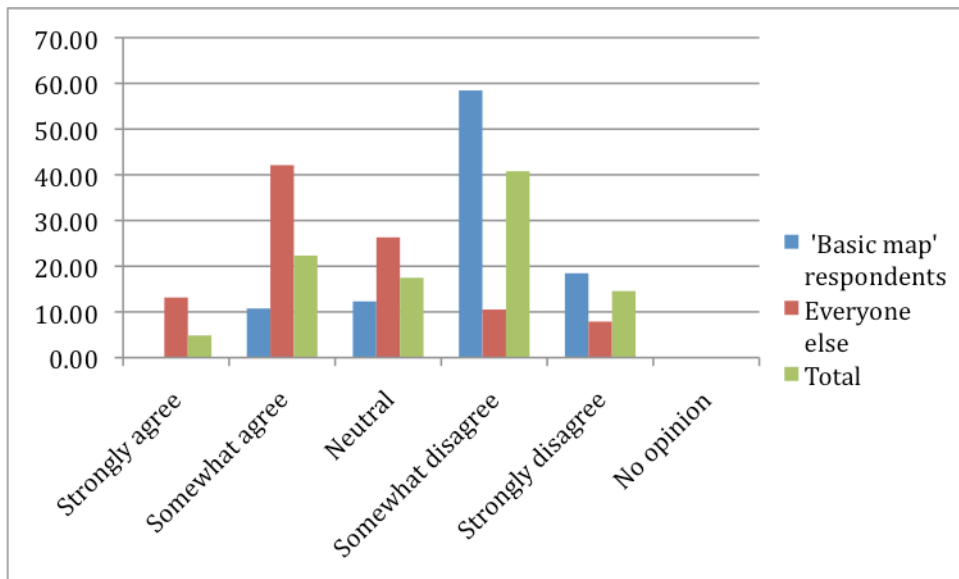
*Note: only one answer was allowed per statement.*

|   | Strongly agree | Somewhat agree | Neutral  | Somewhat disagree | Strongly Disagree | No opinion |
|---|----------------|----------------|----------|-------------------|-------------------|------------|
| I prefer to use maps that include as many details as possible.                                  | 14 (14%)       | 62 (60%)       | 11 (11%) | 14 (14%)          | 2 (2%)            | 0 (0%)     |
| I prefer to start with a basic empty map and add detail as needed.                              | 23 (22%)       | 42 (41%)       | 16 (16%) | 17 (17%)          | 5 (5%)            | 0 (0%)     |
| I prefer to start with a very detailed map and remove detail as needed.                         | 5 (5%)         | 23 (22%)       | 18 (17%) | 42 (41%)          | 15 (15%)          | 0 (0%)     |
| I prefer to use applications with 3-dimensional displays when possible.                         | 5 (5%)         | 23 (23%)       | 40 (39%) | 21 (21%)          | 11 (11%)          | 2 (2%)     |
| I prefer to use applications with animation when possible.                                      | 2 (2%)         | 15 (15%)       | 36 (35%) | 36 (35%)          | 10 (10%)          | 3 (3%)     |
| I prefer to use open source (free) software rather than proprietary software whenever feasible. | 46 (45%)       | 38 (37%)       | 14 (14%) | 2 (2%)            | 0 (0%)            | 3 (3%)     |

The second and third questions – “I prefer to start with a basic empty map and add detail as needed” and “I prefer to start with a very detailed map and remove detail as needed” – were intentionally opposites in order to ensure that respondents were consistent. Responses were checked for consistency by separating respondents who chose “strongly agree” or “somewhat agree” to “I prefer to start with a basic empty map and add detail as needed”. These people’s responses to the next statement (“I prefer to start with a very detailed map and remove detail as needed”) were then compared to everyone else. The numbers and a visual analysis can be seen in Table 4.13 and Figure 4.3. The consistent responses between questions allows the conclusion to be drawn that a basic empty map with the option to add detail is preferred to a very detailed map with the option to remove detail.

**Table 4.13: Responses to “I prefer to start with a very detailed map and remove detail as needed” by people indicating they prefer to start with a basic map and add detail.**

|                    | Strongly agree | Somewhat agree | Neutral | Somewhat disagree | Strongly disagree | No opinion | Total |
|--------------------|----------------|----------------|---------|-------------------|-------------------|------------|-------|
| 'Basic map' people | 0              | 7              | 8       | 38                | 12                | 0          | 65    |
| Everyone else      | 5              | 16             | 10      | 4                 | 3                 | 0          | 38    |
| Total              | 5              | 23             | 18      | 42                | 15                | 0          | 103   |



**Figure 4.3: Visual of values from Table 4.12 The strongly opposite responses between the 'basic map' respondents to everyone else indicate consistency.**

#### 4.5.5 Software use and frustration

The first question about specific software usage was asking about the respondents' opinion on open source software (Table 4.12). When the responses for this question were separated by response group, an interesting split in opinion occurs (Table 4.14).

**Table 4.14: Responses to “I prefer to use open source (free) software rather than proprietary software whenever feasible” separated into the seven response groups.**

| Response Group | Strongly agree | Somewhat agree | Neutral | Somewhat disagree | Strongly Disagree | No opinion |
|----------------|----------------|----------------|---------|-------------------|-------------------|------------|
| Administration | 4              | 1              | 1       |                   |                   |            |
| Staff          | 1              | 4              | 1       |                   |                   | 2          |
| Faculty        | 2              | 8              | 1       | 1                 |                   |            |
| Grad Students  | 20             |                | 5       |                   |                   | 1          |
| Undergrad      | 1              | 3              | 15      | 6                 | 2                 |            |
| Alumni         | 4              | 2              |         | 1                 |                   |            |
| Public         | 3              | 2              | 1       |                   |                   |            |

Respondents were then asked to indicate the frequency with which they used common types of software. Results are presented in Appendix K. This question was asked for the purpose of getting people to consider their common computer uses and commonly used programs. The goal was to encourage responses to the question “Are there any software programs that you have stopped using because of frustration?” and in particular the follow-up, “If yes, which one?” (see Appendix K for all responses) 31 people typed a response to the follow-up question. Using a qualitative analysis of the common words in the written responses, the most common responses can be seen in Figure 4.4.

**Table 4.15: Programs or types of programs that more than one person have stopped using (or indicated a desire to stop using) because of frustration. See Appendix K for the complete list.**

| Programs causing frustration     | Number of people indicating they have stopped or would like to stop using the program |           |
|----------------------------------|---|-----------|
| Microsoft products:              | Word  | 2         |
|                                  | Excel   | 1         |
|                                  | Internet Explorer   | 1         |
|                                  | Office  | 1         |
|                                  | Microsoft – not specific  | 2         |
|                                  | <b>Microsoft total</b>  | <b>7</b>  |
| Mac products:                    | iPhoto  | 1         |
|                                  | Everything except email   | 1         |
|                                  | <b>Mac total</b>  | <b>2</b>  |
| Online programs or web services: | Capital Regional District’s online regional atlas                                     | 1         |
|                                  | Integrated Virtual Learning Environment   | 1         |
|                                  | uSource   | 1         |
|                                  | UVic website  | 1         |
|                                  | vBulletin   | 1         |
|                                  | <b>Other total</b>  | <b>5</b>  |
|                                  | <b>Total</b>  | <b>14</b> |

#### 4.5.6 Plug-ins

The next three questions asked about web browser plug-ins. While 83% of people had downloaded a plug-in, 62% considered this to be a nuisance. A further 81% of respondents had abandoned an activity because of the need to download a plug-in. 57 respondents (55%) had responses as to why downloading a plug-in was a nuisance. The summary of responses based on a qualitative keyword analysis is provided in Table 4.16.

**Table 4.16: Common responses to why people find it a nuisance to download a plug-in.**  
*Note: respondents may have provided more than one reason. See Appendix K for the complete list.*

| Concerns raised by respondents                           | Number of respondents identifying the concern |
|--|---|
| Additional time required                                 | 17  |
| Security concerns  | 10  |
| Additional program being added to their computer         | 8   |
| Compatibility issues with browser/operating system       | 8   |
| Additional step required                                 | 6   |
| Requires computer administrator to complete              | 5   |
| Requirement of plug-ins to restart computer or browser   | 4   |
| Requirement for future updates/versions to be downloaded | 2   |
| Total  | 57  |

#### 4.5.7 Handheld devices

The penultimate question was to ask about using an online mapping application on a small handheld device, with 68% of respondents saying yes. While many respondents will be familiar with using services such as Google Maps™ on their mobile devices, further surveying and testing would be necessary to gauge users' willingness to use such a detailed mapping application on a small screen.

#### 4.6 Implications of the results

The survey results indicated a cartographically literate and relatively technologically competent group. This was to be expected due to significant recruitment via email, and online completion by respondents in groups 3-7.

Two of the findings in the survey were particularly influential to the design process. First, the almost universal dislike for plug-ins. The time, extra step, and security concerns are important, however the predominance within the university population of people who

do not have administrative access to their computers and therefore would not be able to download a plug-in, is the largest concern. Unless a plug-in is installed on all computers received from a computer store or after installation by the university service department, a mapping application must work within the framework of a basic browser installation.

Second was the support for open source software (Table 4.12). Interestingly, all groups except for undergraduate students were in favour of open source software (Table 4.14). The reasons behind this split are impossible to determine, but it should be noted that the people who would have to authorize any funding for a new mapping application strongly support free software. With restricted budgets, these responses required the end product to being designed with open source software.

Other important conclusions are that respondents indicated that choices should be given wherever possible. Even with an inherent bias in the response group towards people who use maps, a large enough portion indicated a preference for data tables and dropdown menus that these options should be provided. The lack of consistent responses when given a choice between traditional and satellite hybrid maps requires that the choice be given.

## 5. User-Centered Design Stage Three (Prototyping)

### 5.1 Introduction

This chapter discusses stage three of the UCD process – prototyping. Prototype development was based on the work domain analysis and conceptual development that was conducted via the survey as discussed in Sections 2.3 and 4.3, with results given in Appendix K and Chapter 4.

### 5.2 Application Requirements and Platform

As discussed in Section 4.6, several significant determining factors resulted from the survey regarding the framework of the prototype. These were:

- Mapping application should be developed using open source software.
- Mapping application must not require a plug-in to be downloaded.
- Map should give users choices whenever possible.
- Options should be provided for users to view data using tables and dropdown menus.

A number of different platforms were examined with the assistance of documentation on creating internet maps and online interactive maps (Crampton, 2010; Duvander, 2010; Harder, 1998; Sandvik, 2008; Svennerberg, 2010). Based on the requirement for open source software, and based on the sophistication required of the application, the prototype was developed using Drupal 6. Drupal is “an open source content management platform powering millions of websites and applications. It is built, used, and supported by an active and diverse community of people around the world.”

(Drupal, n.d.) This software is very powerful, with many optional modules allowing developers to add features to the basic framework. The mapping capability for this application was provided through a module called 'OpenLayers'. The UVic Community Mapping Initiative (2011), a group with strong ties to the UVic Faculty of Social Sciences and Department of Geography, agreed to host the prototype mapping application on their server.

### **5.3 Development**

Initial prototype development took place between February 2011 and April 2011, requiring approximately 150 hours of development time. The development time would end up being much higher because, as discussed in Chapter 2, the prototype would be further refined during stage four of the UCD process – interaction and usability studies. Stage four and its results are discussed in Chapter 6. The researcher completed the development with technical assistance provided by Charles Burnett of GeoMemes. GeoMemes is a local Victoria company with strong ties to community mapping, the university, and the OpenLayers module.

The mapping application was developed to imitate the UVic website structure (width, menu layout, links, etc.). However the template was Drupal based, and not the software used by the main UVic website. The Drupal template was used because access to the official UVic template is restricted to the developers on UVic staff who design and maintain the official UVic website. The two templates are visually indistinguishable, allowing for participants to focus on the application rather than the template appearance.

Full implementation of the prototype, however, would require it to be adapted to the UVic template. This will be further discussed in Chapter 7.

#### **5.4 Data**

The data for the prototype were the same as the data used for the initial project with VPAC (Chapter 3). These data focused on the Faculty of Business, international co-op, and student exchanges. The data provided a sample with which the framework of a mapping application could be tested. The data in no way attempted to be a complete picture of UVic's connection to the rest of the world. The data was also at least three years old. Any functional mapping application would require more frequent updates to ensure the usefulness of the application. This will be discussed further in Sections 5.9 and 7.3.

#### **5.5 Mapping Application Structure**

Prototype design followed, whenever possible, recommendations and ideas by Brewer (2008), Nielsen (1993, 2012) and Tufte (1983) among others. At its root, the mapping application had seven world maps. Each map presented the data in a different way. Depending on the map, not all international connections would be displayed, allowing the user to filter their map to find the information desired. This was done in response to the majority of survey respondents desiring a simple map to which they could add detail.

The seven maps were:

1. Countries map: Every country with an international connection had a marker. This map is the default map presented to users when initially visiting the website.
2. Faculties map: This map sorted the international connections by faculty. Each faculty had a different coloured marker (colour choice is discussed later). Faculties could be isolated to allow users to select only the faculties of interest.

3. Co-op map: A map displayed UVic's international co-operative education and internship placements.
4. Exchanges map: A marker appeared on every country with a university exchange program available to UVic students.
5. Partner universities map: A map displayed all the countries in which UVic had a formal agreement with a local university.
6. Research map: A map displayed all the countries in which a member of the UVic community is conducting research.
7. All connections map: A map upon which a marker appeared for every international connection. This map did not aggregate by country, therefore each international connection appeared on the actual location of that connection.

The seven maps will be discussed through a series of screenshots in Sections 5.7.1 – 5.7.3.



The mapping application prototype can be found at: <http://mapping.uvic.ca/interproto>.

## 5.6 Common Features

All maps had some features in common. These included dropdown menus, pan and zoom options, full screen option, base map options, and marker colours.

A dropdown menu was provided at the bottom of each map to allow users to navigate to a country (or faculty, depending on the map being viewed) without requiring the user to click on a map marker.

Pan and zoom options were located at the top left of each map, but could also be done using the mouse.

A full screen map could be toggled using the  button located at the top right of every map. Just below the full screen button was the layer and map options button, .












This button provided users with the opportunity to change the base map, and in some cases, the overlays.

The base map options allowed users to toggle between four versions of Google Maps™ – satellite, hybrid, normal, physical. For a world map, survey respondents indicated a slight preference for a traditional ‘normal’ map (20% respondents versus 17%), although the majority of respondents (57%) wanted the application to give them the choice (Table 4.9).

At the beginning of prototype development, the hybrid map was provided as the start up base map, however during interaction with potential users, feedback indicated a preference for Google’s physical map. This feedback will be discussed in Chapter 6.

Colours and shapes for the markers was consistent between all the maps (Table 5.1). Yellow was used for connections not associated with a faculty. All connections with a specific faculty were coloured based on UVic’s branding rules (University of Victoria Branding Guidelines, 2008). This will be discussed further in Chapter 6. The shapes were designed by the researcher based on themes already in use by UVic.

**Table 5.1: Colours and icons used for international connections in prototype online mapping application.**

| Icon   | Faculty or type              |
|--|------------------------------|
|   | Business                     |
|   | Education                    |
|   | Engineering                  |
|   | Fine Arts                    |
|   | Human and Social Development |
|   | Humanities                   |
|   | Law                          |
|   | Science                      |
|   | Social Sciences              |
|   | Co-op location               |
|  | General exchange location    |

## 5.7 The Seven Maps

### 5.7.1 Countries Map

This map began with a world map with a marker placed at the geographic center of each country (Figure 5.1). Clicking on any of these markers opened a new page with a map displaying that country with markers indicating the actual location of the international connections (Figure 5.2). Alternatively, a dropdown menu was provided below the map to allow users to select a country from a list. The list contained only the countries in which UVic had international connections. This feature was added in response to the 16% of survey respondents who indicated a preference for dropdown menus, however it was also useful for people who may not know the location of a country, or in situations where a

country is small enough that finding its marker amongst its neighbours may be difficult without zooming.

The shape and colour of the marker indicated the faculty or whether the connection is for a co-op or exchange connection (Table 5.1). A legend to the left of the map illustrated what each marker meant. Below the map was a table listing all the connections appearing on the map. A map icon or a table entry could be clicked on to learn more information about that particular connection (Figure 5.3). The same dropdown menu as on the top-level map was provided for users who wished to change to another country without first returning to the top-level map (Figure 5.2).

University of Victoria's International Connections: | Prototype International Connections Map

http://mapping.uvic.ca/interproto/ Google

University of Victoria | International Mapping Prototype

UVic Home | Academic Calendar | A-Z List | Maps and Buildings | uSource login

Search Directories | Search uvic.ca

Countries Map | Faculties Map | Co-op Map | Exchanges Map | Partner Universities Map | Research Map | All Connections Map

Home

About


View data using maps

View data using tables

Country Connected to UVic

Click + in the top right of the map to change base layer.

### University of Victoria's International Connections:



Click on an icon to learn more.

**Pan:** Click and drag in the map screen or the controls in the top left corner of the map.

**Zoom:** Double click to zoom in, scroll wheel to zoom in or out, or the controls in the top left corner of the map.

**Full screen:** Click on the arrows (top right) to expand map to the full screen.

**Map options:** Click on the + to change layer and map options.

Click a marker above, or choose a country:

- Choose -

Login | Contact UVic | Feedback | Legal Notices | Copyright Info | Updated Info | Accessibility | A A A

Figure 5.1: Countries map, also the default opening page of the mapping application.

JAPAN | Prototype International Connections Map

http://mapping.uvic.ca/interproto/all/japan

University of Victoria | International Mapping Prototype

UVic Home | Academic Calendar | A-Z List | Maps and Buildings | uSource login

Search Directories | Search uvic.ca

Countries Map | Faculties Map | Co-op Map | Exchanges Map | Partner Universities Map | Research Map | All Connections Map

Home


About

View data using maps

View data using tables

Faculty:

- Business
- Education
- Engineering
- Fine Arts
- Human and Social Development
- Humanities
- Law
- Science
- Social Sciences
- Co-op Location
- General Exchange



Click on an icon or an item in the table below to learn more.

**Pan:** Click and drag in the map screen or the controls in the top left corner of the map.

**Zoom:** Double click to zoom in, scroll wheel to zoom in or out, or the controls in the top left corner of the map.

**Full screen:** Click on the arrows (top right) to expand map to the full screen.

**Map options:** Click on the + to change layer and map options.

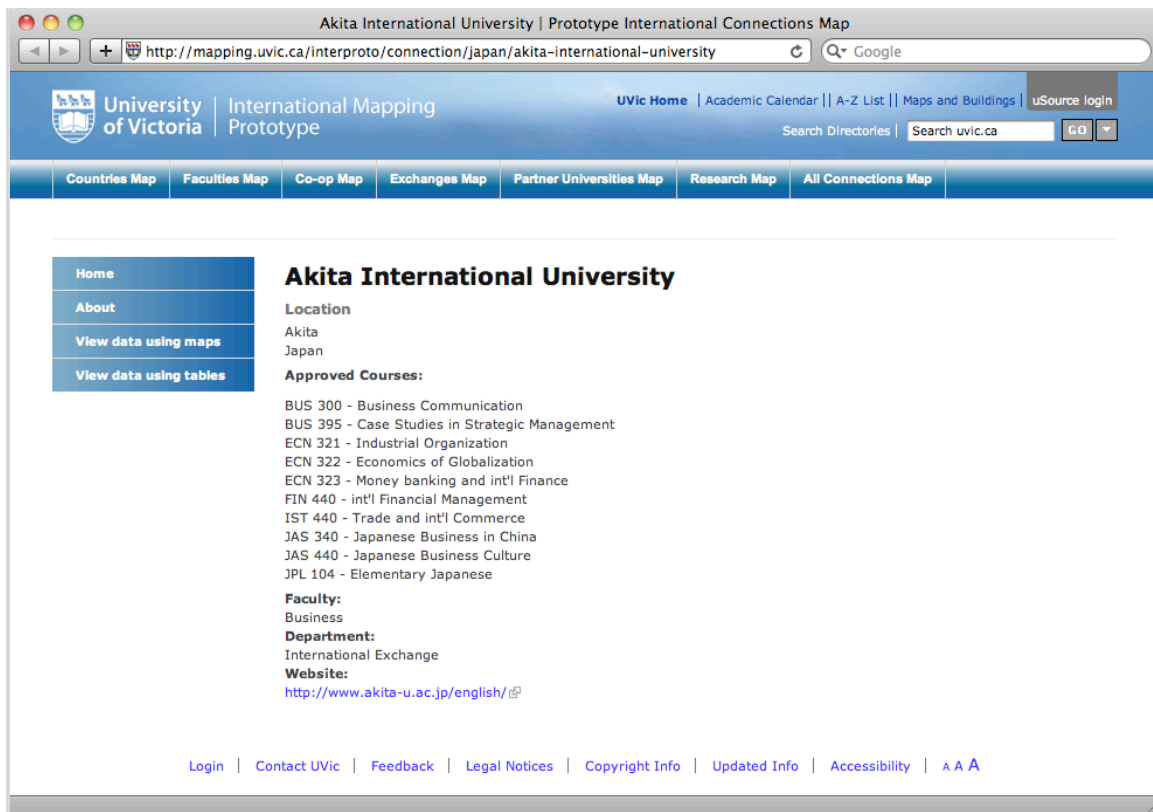
Jump to a different country:

Choose -

### JAPAN

| Title  | Faculty  | Department             | City  |
|--|----------|------------------------|-------|
| <a href="#">Akita International University</a> | Business | International Exchange | Akita |
| <a href="#">Kwansei Gakuin University</a>      | Business | International Exchange | Kobe  |
| <a href="#">Ritsumeikan University</a>         | Business | International Exchange | Kyoto |
| <a href="#">Rikkyo University</a>              | Business | International Exchange | Tokyo |
| <a href="#">Sophia University</a>              | Business | International Exchange | Tokyo |

Figure 5.2: Sample map opened when a country's marker was clicked.



**Figure 5.3: Details provided for one of UVic's international connections.**

### 5.7.2 Faculties, Co-op, Exchange, Partner Universities, and Research Maps

With the exception of the 'All Connections Map', the other maps operated in a very similar manner to the 'Countries Map'. The top-level map had the connections aggregated by country and the detail maps for each country displayed the actual locations of the connections. The 'Faculties Map' was slightly different in that the top-level map offered users the option of isolating a single faculty, or choosing to display a number of faculties (Figure 5.4) through the use of the layer options located in the top left of the map. Isolating a faculty would change the map to only displaying connections such as partner universities or research locations associated with the chosen faculty.



Figure 5.4: Faculties map illustrating the two methods of isolating faculties.

### 5.7.3 All Connections Map

The 'All Connections Map', displayed all of UVic's international connections at their actual locations, i.e. without aggregating by country (Figure 5.5). This map was intended to be a cluttered mass of icons with the intent that it be a visual representation of UVic's connectedness. This map also provided a tool for the survey respondents that preferred to start with a very detailed map and remove detail as needed (see Chapter 4). The map

provided users with layer options to filter the connections being displayed to narrow the focus of the map (Figure 5.6).

The screenshot shows a web browser window displaying the 'All of UVic's International Connections: | Prototype International Connections Map'. The browser address bar shows the URL 'http://mapping.uvic.ca/interproto/actual'. The page header includes the University of Victoria logo and navigation links such as 'UVic Home', 'Academic Calendar', 'A-Z List', 'Maps and Buildings', and 'uSource login'. A search bar is also present. Below the header, there is a menu with tabs for 'Countries Map', 'Faculties Map', 'Co-op Map', 'Exchanges Map', 'Partner Universities Map', 'Research Map', and 'All Connections Map'. The main content area features a sidebar with navigation options: 'Home', 'About', 'View data using maps', and 'View data using tables'. The central part of the page is titled 'All of UVic's International Connections:' and contains a world map with various icons representing international connections. A legend on the left side of the map lists faculties: Business, Education, Engineering, Fine Arts, Human and Social Development, Humanities, Law, Science, and Social Sciences. Below the map, there is a table with the following data:

| Title   | Country   | City         | Faculty  | Website                 |
|---|-----------|--------------|----------|-------------------------|
| <a href="#">Pontificia Universidad Catolica Argentina</a> | Argentina | Buenos Aires | Business | <a href="#">Website</a> |
| <a href="#">Australia Co-op</a>                           | Australia | Melbourne    |          |                         |
| <a href="#">Australia Co-op</a>                           | Australia | Melbourne    |          |                         |
| <a href="#">Australia Co-op</a>                           | Australia | Brisbane     |          |                         |

Figure 5.5: All Connections Map.



**Figure 5.6: Base layer and connection type options for All Connections map. Level of detail (number of faculties displayed) can be chosen by the user.**

## 5.8 Tables

All of the data available on the seven maps were also available through data tables. 5% of survey respondents indicated a preference for data tables over maps or dropdown menus. As described earlier, data tables were provided below the country maps. For people preferring to use only data tables, a link was provided in the menu bar on the left side of the window. The available tables can be seen in Figure 5.7 with an example of a table in Figure 5.8.

The screenshot shows a web browser window with the URL <http://mapping.uvic.ca/interproto/uvic-connections-tables>. The page header includes the University of Victoria logo and navigation links: UVic Home, Academic Calendar, A-Z List, Maps and Buildings, uSource login, Search Directories, and a search box for uvic.ca. A secondary navigation bar contains links for Countries Map, Faculties Map, Co-op Map, Exchanges Map, Partner Universities Map, Research Map, and All Connections Map.

The main content area features a left sidebar with a menu: Home, About, View data using maps, View data using tables (expanded), Types, Faculties, and All Connections. The main heading is "UVic Connections Tables" with the instruction: "Select one of the following to view UVic's international connections in a table:". Below this, there are two sections: "By Type:" with links for Co-op Locations, Exchange Locations, Partner Universities, and Research Locations; and "By Faculty:" with links for Business, Education, Engineering, Fine Arts, Human and Social Development, Humanities, Law, Science, and Social Sciences. An "Or:" section offers a link for "All connections in one table".

At the bottom of the page, there is a footer with links for Login, Contact UVic, Feedback, Legal Notices, Copyright Info, Updated Info, Accessibility, and A A A.

**Figure 5.7: Tables available as part of the mapping application.**

| Title  | Faculty  | Department                         | Country   | City         | Website   |
|--|----------|------------------------------------|-----------|--------------|---|
| <a href="#">Pontificia Universidad Catolica Argentina</a>          | Business | International Exchange             | Argentina | Buenos Aires | <a href="http://www.uca.edu.ar/">http://www.uca.edu.ar/</a>   |
| <a href="#">Yohannes Kepler Universitat</a>                        | Business | Global MBA, International Exchange | Austria   | Linz         | <a href="http://www.uni-linz.ac.at/index_e.htm">http://www.uni-linz.ac.at/index_e.htm</a>                   |
| <a href="#">IAG - Louvain School of Management</a>                 | Business | International Exchange             | Belgium   | Louvain      | <a href="http://www.uclouvain.be/">http://www.uclouvain.be/</a>   |
| <a href="#">Universidade de Sao Paulo</a>                          | Business | International Exchange             | Brazil    | Sao Paulo    | <a href="http://www4.usp.br/">http://www4.usp.br/</a>   |
| <a href="#">Pontificia Universidad Catolica de Valparaiso</a>      | Business | International Exchange             | Chile     | Valparaiso   | <a href="http://psu1.ucv.cl/">http://psu1.ucv.cl/</a>   |
| <a href="#">Lingnan University</a>                                 | Business | International Field Exercise       | China     | Hong Kong    | <a href="http://www.ln.edu.hk/">http://www.ln.edu.hk/</a>   |
| <a href="#">University of International Business and Economics</a> | Business | International Exchange             | China     | Beijing      | <a href="http://www.uibe.edu.cn/">http://www.uibe.edu.cn/</a>   |
| <a href="#">Shanghai Jiao Tong University</a>                      | Business | International Exchange             | China     | Shanghai     | <a href="http://www.sjtu.edu.cn/english/index/">http://www.sjtu.edu.cn/english/index/</a>                   |
| <a href="#">Tongji University</a>                                  | Business | International Exchange             | China     | Shanghai     | <a href="http://www.tongji.edu.cn/english/inc/index.asp">http://www.tongji.edu.cn/english/inc/index.asp</a> |
| <a href="#">City University of Hong Kong</a>                       | Business | International Exchange             | China     | Hong Kong    | <a href="http://www.cityu.edu.hk/">http://www.cityu.edu.hk/</a>   |

**Figure 5.8: Table of all partner university connections sorted by faculty then country. Each column other than website can be sorted in either ascending or descending order.**

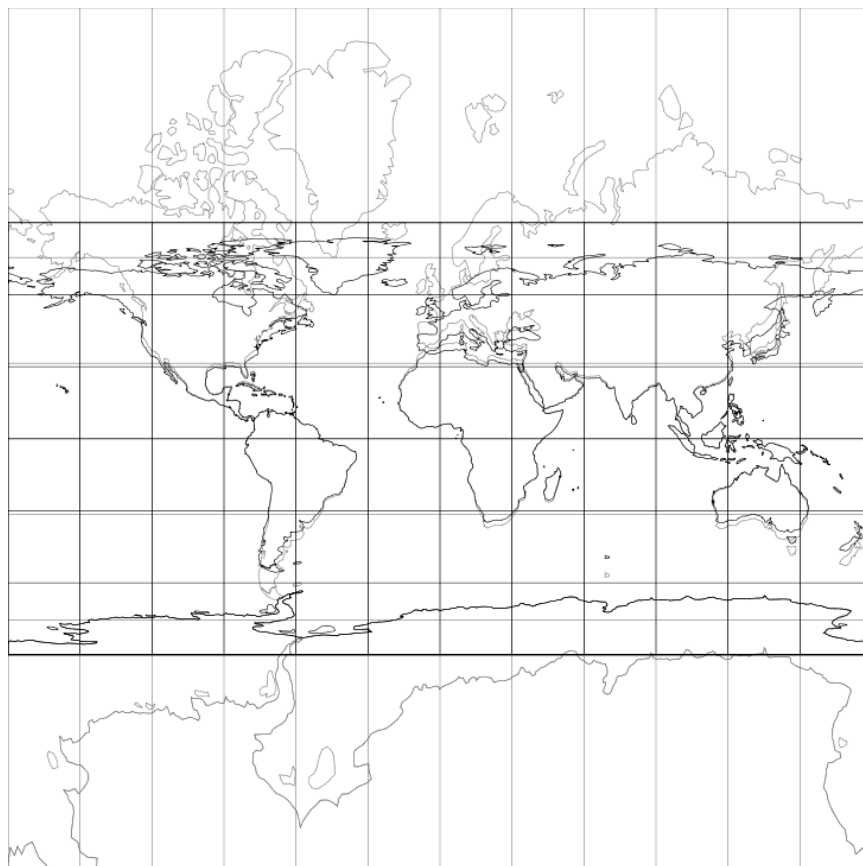
## 5.9 Updating Data

One of the critical factors in choosing Drupal and OpenLayers for the mapping application is that Drupal has a very sophisticated system of registering users to provide means of submitting data. This software is commonly used for online community and green mapping projects (Georgia Strait Community Map, n.d.; UVic Community Green Map, 2008), in which users can register with the website and add elements to the map. Security

preferences can range from any user being authorized to submit data, to only designated users being authorized. In the middle of this range is the ability to allow any registered user to submit data, however it is then held in storage until vetted by a moderator. This system could be ideal for this mapping application because it would allow for any member of the UVic population to submit data to the application. The vetting process would ensure that only genuine international connections would appear on the maps. The challenge of keeping the data current will be discussed more thoroughly in Section 7.3.

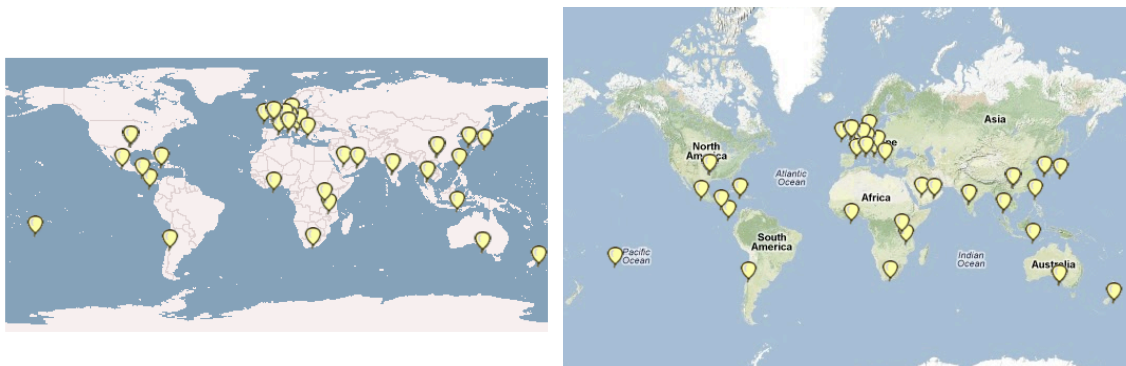
### **5.10 Map Projections**

At the time of product design, a few elements were desired by survey respondents, but were not possible to implement due to software limitations. The most significant of these was to do with map projections. Survey respondents indicated a strong preference for a Robinson-style map projection over the more common spherical Mercator projection used by Google and most other online mapping services. Using a different projection was possible in a very limited way with the OpenLayers module. OpenLayers can use the EPSG:4326 projection, which is a geographic latitude-longitude projection (often referred to as the Plate Carrée projection or equidistant cylindrical projection, but hereafter referred to as the 4326 projection). This projection makes all lines of longitude parallel, and keeps the distance between lines of latitude equal. This differs from the Mercator projection because the distances between lines of latitude in the Mercator projection grow as you move away from the equator (Figure 5.9).

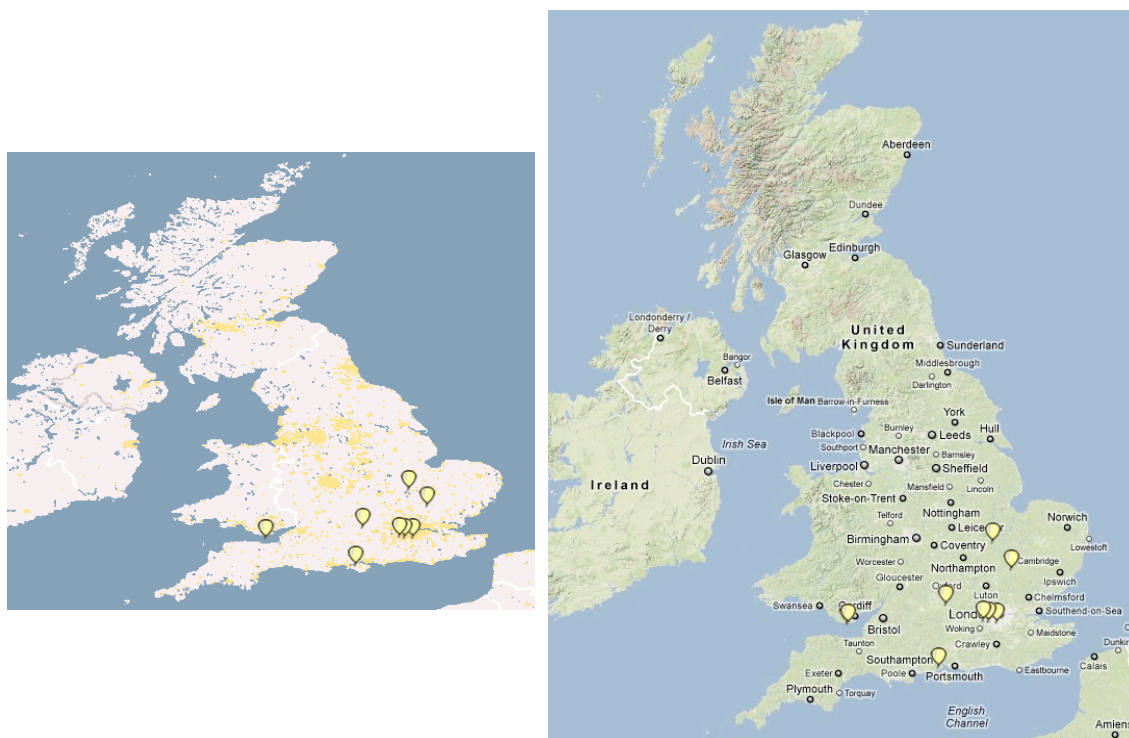


**Figure 5.9: 4326 projection (black) compared to Mercator projection (gray).**  
<http://freegeographytools.com/2009/make-your-own-map-projection-with-flex-projector>

The 4326 projection is an improvement over the Mercator projection used by Google Maps™, however the overall quality of the base map was not high enough for the mapping application. In particular, shapes were not smooth and country and city labels were not attached to the map. A comparative sample of UVic's international co-op locations using the 4326 projection versus the Mercator projection is shown in Figure 5.10, with a comparative sample of a country map shown in Figure 5.11. The mapping application is designed so that if a new base map is developed incorporating an improved projection, the application can be easily switched over.



**Figure 5.10: Comparison of the two available projections to display UVic's international co-op locations.**



**Figure 5.11: Co-op locations in the United Kingdom illustrating the two available projections. The 4326 projection on the left has a more realistic shape, however the lack of detail made it unacceptable for the application.**

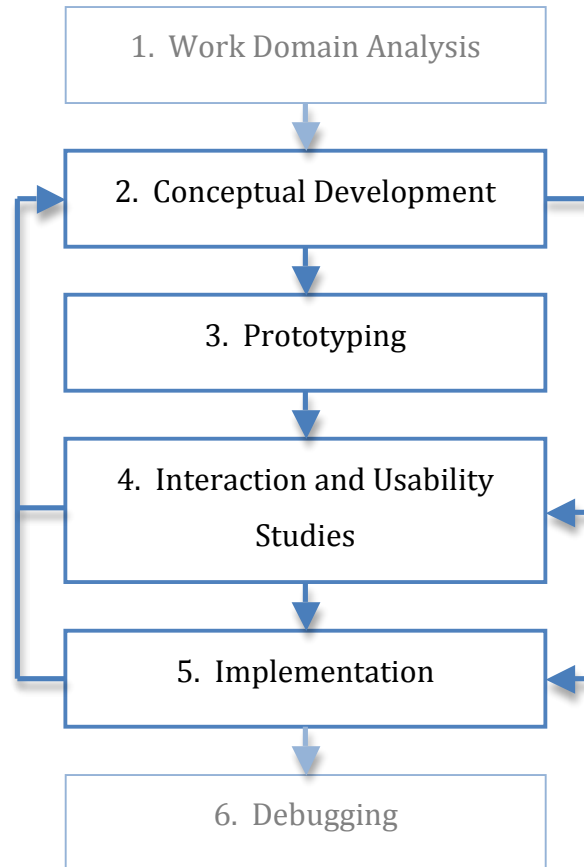
### **5.11 Expert review of the prototype**

The researcher and his supervisory committee (both of whom have an extensive background in cartography) reviewed the prototype prior to beginning the interaction and usability study stage of UCD with the users. The assistance of 'experts' prior to usability studies is supported in the literature (Nielsen, 1993; Nivala et al., 2003; Robinson et al., 2005; Roth et al., 2010).

## **6. User-Centered Design Stage Four and Five (Interaction & Usability Studies and Implementation)**

### **6.1 Introduction**

The primary goal of these stages of the UCD process is to collect feedback on the prototype to determine issues, bugs, and design improvements that can or should be implemented into the product. While this chapter will focus primarily on stages four (interaction and usability studies) and five (implementation), the iterative nature of UCD requires that after feedback is collected, it is used to re-conceptualize the design (stage two), rebuild or adapt the prototype if needed (stage three), and then return to the users for more feedback (stage four). See also Figure 6.1, as discussed in Sections 1.2.2, 2.2, and 2.3.



**Figure 6.1: Iterative portion of Robinson et al.'s (2005) UCD process.**

## **6.2 Workshops to Interviews**

Interaction and usability studies were originally designed for a workshop setting. During the survey, participants were asked if they were interested in participating in a future workshop. As stipulated by UVic's Human Research Ethics Board, this approval was necessary for the researcher to retain contact information and to contact them following prototype development. Representation from each of the seven user groups described in Section 4.1 would be sought.

Following prototype development, it was decided that the workshop would be adapted to an interview to be conducted one-on-one with the researcher. This change was made for two primary reasons. First, the level of participation in a single scheduled event was going to be significantly lower than if individual interviews could be conducted at a participant's convenience. Second, interviews could be scheduled with less prior notice.






A benefit of individual interviews over a workshop was that the iterative system essential for UCD was much easier to implement. As described by Roth et al. (2010), feedback and issues could be implemented immediately and therefore future interviews would not be reviewing the same problems. With each iteration, the prototype could be fine-tuned into a more useful and production-ready product.

### **6.3 Results**

Seven participants were interviewed between November 2011 and January 2012. The original goal was to interview approximate 10-12 participants, however given their representation of the response groups (Table 6.1), the feedback was considered sufficient. A lack of interest in continued participation from the alumni and public groups was not surprising given the recruitment methods for the survey and the need for those respondents to submit a statement of interest to the researcher. This lack of representation was deemed acceptable for two reasons. First, the primary users of this product will, at least initially, be people more closely associated with the university. If the product grows to become a prominent marketing tool to the public, a future survey and usability study with the public could be conducted. Second, responses to the survey by alumni and the public were very consistent with that of other groups, indicating that

possible concerns of alumni and the public would hopefully also be noticed by one of the other participants.

**Table 6.1: Workshop (interview) participants.**

| Response               | Chart   | Percentage             | Count    |
|------------------------|---|------------------------|----------|
| Administration         |  | 14%                    | 1        |
| Staff                  |  | 43%                    | 3        |
| Faculty                |  | 14%                    | 1        |
| Graduate Students      |  | 14%                    | 1        |
| Undergraduate Students |  | 14%                    | 1        |
| Alumni                 |   | 0%                     | 0        |
| Public                 |   | 0%                     | 0        |
|                        |   | <b>Total Responses</b> | <b>7</b> |

#### 6.4 Interview Structure

Interviews were scheduled for 30 minutes at the convenience of the participants. The shortest was approximately 20 minutes, with the longest being approximately 60 minutes. Although each interview followed the same schedule (Table 6.2), the length varied depending on the level of interest, the number of questions asked of the researcher, and the time available to the participant.

**Table 6.2: Structure of participant interviews.**

| Activity  | Approximate time spent |
|---|------------------------|
| Sandbox – free time available for the participant to explore on their own | 3-5 minutes            |
| Recording of initial impressions, questions, concerns                     | 5-10 minutes           |
| Task completion   | 3-5 minutes            |
| Questions   | 5-10 minutes           |
| Final thoughts and comments   | 3-5 minutes            |
| <b>Total</b>  | <b>19-35 minutes</b>   |

## 6.5 Interview Components and Results

### 6.5.1 Sandbox

The interviews began with the participants navigating to the mapping application and being given a few minutes to explore the application. Participants generally navigated to their particular subject area to see what information was provided. Due to the nature of the prototype and the limited scope of the raw data collected for the prototype (as discussed in Sections 3.5 and 5.4), this information was not available for three of the participants. In all cases, participants moved on to other areas of interest in which more data was available in order to keep testing the application.

Questions, concerns, or issues raised at this stage of testing focused primarily on data quality, completeness, and currency.

Examples of comments:

- ‘Global MBA’ program has been renamed ‘Master of Global Business’

- Victoria University, Australia, is not in the correct location
- Research conducted by Faculty of Science is not complete
- Co-op connections are not the most recent data
- A shape could be added to faculty icons so that there is a shape as well as a colour difference.

One concern raised at this stage was of particular note. The data provided to the researcher by UVic's co-op education included more information than they were comfortable sharing. It was felt by the participant that the level of data provided could allow competing universities to gain too much information on UVic's connections and could lead to UVic losing those connections. While the data used in the prototype were originally provided by the co-op department and the identical data were actually available on the co-op website, the prototype was modified to remove almost all the details regarding international co-op connections.

### **6.5.2 Initial impressions**

After having a few minutes to navigate through the application, the participants were asked for their initial impressions. All participants had positive reactions, although all found areas for improvement (Figure 6.2).

- Too much white space in tables – too much scrolling is needed
- Table heading called “title” would be clearer if it was changed to “summary”
- Country maps should have a full screen option
- Full screen button should be in the bottom right of maps (to be consistent with services such as YouTube™)
- Co-op and career services needs its own icon rather than being classified according to the faculty of the co-op student
- Difference between “partner universities” and “exchange locations” needs to be made more clear
- Colour difference between some of the faculty icons is not distinct enough
- Icons can sometimes be difficult to click on
- Instructions on changing base map types (from satellite photo to traditional map) need to be provided
- Country maps have too much clutter – detailed highway information is not helpful
- The maps should be larger on the screen, i.e. take up more of the browser window

**Figure 6.2: Results from initial impressions stage of interview.**

Most of this feedback was incorporated into the prototype as part of the iterative stages of UCD, although sometimes this was not possible. Feedback not implemented will be discussed later in this chapter and also in Section 7.2.2.

### 6.5.3 Task completion

The third portion of the interview asked the participants a question to which they would need to use the mapping application to find the information. The following question was asked:

“You are studying business and are looking to do an international exchange to Japan. Find the list of approved courses offered at Akita International University.”

The method that each participant used to find the information was recorded. (Table 6.3) Each participant began at the opening page of the mapping application. All were able to find the desired information with no assistance.

**Table 6.3: Path taken by each participant during task completion portion of interview.**

| Participant A   | Participant B   | Participant C   | Participant D   |
|---|---|---|---|
| 'Countries Map'<br>(from header bar,<br>even though this is<br>the default map<br>opened upon<br>loading web page)<br>↓<br>Clicked on Japan's<br>marker<br>↓<br>Clicked on Akita<br>International<br>University's<br>marker | 'Faculties Map'<br>(from header bar)<br>↓<br>'Business'<br>(from table in left<br>bar)<br>↓<br>Clicked on Japan's<br>marker<br>↓<br>Clicked on Akita<br>International<br>University's<br>marker | Clicked on Japan's<br>marker<br>(Countries Map is<br>the default for a<br>fresh load of the<br>application)<br>↓<br>Clicked on Akita<br>International<br>University's<br>marker | Chose 'Japan' from<br>dropdown menu<br>located below the<br>map<br>↓<br>Clicked on 'Akita<br>International<br>University' in the<br>table |
| Participant E   | Participant F   | Participant G   |   |
| 'Exchange Map'<br>(from header bar)<br>↓<br>Clicked on Japan's<br>marker<br>↓<br>Clicked on Akita<br>International<br>University's icon   | Clicked on Japan's<br>marker<br>↓<br>Clicked on Akita<br>International<br>University's<br>marker  | Chose 'Japan' from<br>dropdown menu<br>located below the<br>map<br>↓<br>Clicked on Akita<br>International<br>University's<br>marker   |   |

Each participant was asked the following questions upon completion of the task.

- What was the biggest barrier (if any) to completing this task? Were you able to overcome it?
- What worked well?

Participants did not identify any significant barriers. Below is some of the feedback collected from these questions.

- One of the participants voluntarily did the task twice to test two methods (the methods followed by participant A and B, described in Table 6.3). They stated that

although both worked well, the extra step required to isolate the business faculty could be an issue. They did suggest that if data from all faculties were present on the map, isolating the business faculty might be necessary in order to complete the task.

- No participants identified any significant barriers. When asked, two participants said that although they were reasonably confident they could find Japan on the map, they thought the dropdown menu would be faster. One participant stated that because they were already looking below the map while using the dropdown menu, they saw the 'Akita International University' link in the table before they realized that it also had a marker on the map.
- One of the participants commented that although they had no difficulty finding Japan's and Akita International University's markers, they had a bit of difficulty clicking on them. This problem was also identified during the sandbox activity.
- Responses to "what worked well?" were very limited with all participants indicating that the application worked well. One participant indicated that the floating description attached to each icon was useful (e.g. when the mouse hover's over Japan's marker, the word Japan appears).

#### **6.5.4 Targeted questions for participants**

A set of targeted questions was prepared in advance of the interviews (see Figure 6.3). At this stage these questions were asked if they had not already been raised and addressed.

- Should the background information on the project appear on the welcome page?
- Which map should be first (of the maps available in the header bar)
- Were you able to easily find what you were looking for?
- Has enough detail been provided about each international connection?
- Are there any more details that should be made available?
- Is there any aspects of the overall mapping application that you feel needs improvement? Works well?
- Do you have any other suggestions about how to improve the product?

**Figure 6.3: Targeted questions of the participants.**

Two key outcomes resulted from these questions.

1. Participants were happy with the opening setup of the application; background information was not desired, and using the countries map on the opening page was universally welcomed.
2. Participants were very concerned about the currency of the data being displayed. Five of the seven participants indicated that having less detail on each connection was preferable to more detail if that meant the details were always current and accurate. Another participant also suggested that using links to the partner university or UVic faculty could ensure that specific details would not need to be continually updated. The issues around data currency will be discussed in more detail in Section 7.3.

All feedback from these questions can be found in Appendix M.

### **6.5.5 Participants' final thoughts and comments**

When given the opportunity to provide any final thoughts, all participants stated a continued interest in the prototype, interest in the progress of the research, and asked questions about the possibility of the application moving beyond the prototype stage. This often resulted in a discussion regarding this Masters thesis, however no additional feedback towards modifying and improving the prototype was provided.

## **6.6 Implementation**

Changes were implemented, when possible, throughout the interviews – as discussed earlier. This system proved very successful as the first people interviewed discovered bugs with the application that were significant enough that it was a barrier to identifying smaller issues. For example, Participant A discovered that the coordinate system for all Australian connections was not working. No markers were appearing on the country, but rather they appeared at 0° latitude and 0° longitude. Fixing these bugs immediately after the interview allowed for the remaining participants to identify smaller issues.

Some changes identified by participants could not be implemented. These will be discussed below and in Chapter 7.

## **6.7 Changes not implemented**

There were a few cases where feedback collected from participants could not be implemented. Two of these were not possible due to institutional constraints. First, feedback received from one participant suggested changing the colour of general connection markers (such as the markers on the opening 'Countries Map') from yellow to

blue. On most UVic publications and websites, the most common colour (for non-faculty specific items) is blue. In UVic's Brand Guidelines (2008), however, yellow is also designated as a "Core Brand Colour" (p. 19). With the maps already having a lot of blue oceans, blue markers were not as visible as the yellow. The brand guidelines also require that faculties use specific colours. These colours were used for the markers, making it impossible to adjust the colours to being more distinct from each other.

The second was the desire to increase the width of the maps. The UVic website template is based on a fixed width of 968 pixels and does not allow for a horizontal scroll bar, meaning the maximum map width was 714 pixels. One other requested change that was not implemented was to move the full screen button to the lower right corner of the map. This issue will be discussed in Section 7.2.1.

## **7. Steps to Full Implementation, Implications, and Conclusions**

### **7.1 Introduction**

This final chapter includes four main sections. First, it discusses stages five and six of the UCD process (implementation and debugging). Full implementation of the mapping application was not part of this research, however the anticipated challenges to full implementation will be discussed. The second section discusses the importance of keeping the data current and offers solutions to this problem. The third section covers the implications of this research to the university and the academic community. The final section discusses conclusions drawn from this research.

### **7.2 User-Centered Design Stages Five and Six**

Stages five and six of the UCD process are implementation and debugging. While some of the feedback was implemented (described in Section 6.6), full implementation of the prototype into a functioning mapping application would require overcoming a few critical barriers as discussed below.

#### **7.2.1 Barriers to full implementation**

Full implementation of the mapping application is beyond the scope of this research given that the primary purpose is to demonstrate research capacity to meet the requirements of a master's degree. Time and budgetary limitations also made full implementation not feasible. In order to progress from a functioning prototype to an online mapping application available on UVic's public website, the mapping application

would need to become the responsibility of somebody on campus (for example the Office of International Affairs), and would need to be adopted by UVic Communications. The need for somebody to take lead responsibility for this initiative is to oversee and ensure that the right data are communicated, and that the data remain current. UVic Communications need to be involved because it is their mandate to design and maintain the UVic website. Following the presentation of the VPAC mapping application in January 2010, contact was made between the Office of International Affairs and the communications department regarding the mapping application. At that time, they indicated that if the mapping application was to be available on the main UVic website, they would investigate how to incorporate the application into the UVic website template and existing software. It was also indicated that the new mapping application would require funding to investigate a software platform to be used by their technical staff to program the application into the UVic template. The funding required to pursue this level of integration was not available at the time of this research.

### **7.2.2 Prototype changes**

As mentioned in Sections 5.10 and 6.7, there were four changes to the prototype that were not completed. Failure to implement these changes was due primarily to technical limitations present in the software and the researcher's limited computer programming skill.

One of the major benefits of the open source software chosen for the prototype is that a programmer could be hired to implement all of these changes. This was not done since a) the researcher's budget did not allow for the hiring of a programmer, and b) if UVic

adopts the mapping application, the programming will be completed by UVic's Communications department and may not even utilize the same software as the prototype. It was determined, therefore, that the prototype could be left with a few unimplemented changes. This should not detract from the prototype being able to demonstrate the powerful capabilities of a mapping application.

The first change not implemented was to move the full screen button to the lower right of all the maps. This change would be the easiest and the cheapest of the four to complete.

Second, more tables need to be added to the non-map portion of the application. It was not possible to create a table to mimic the 'Countries Map' with a table, i.e. a table that listed all the connections for a chosen country. These tables were available below the country's map, but not on their own (the table was populated from the map).

Third, the application should utilize a Robinson-style map projection. This change would potentially be very expensive due to the difficulty in adapting the software to use the standard latitude and longitude system on a map with curved lines of longitude. The change in projection would, however, vastly improve the application. Not only was the Robinson-style projection preferred by two-thirds of the survey respondents, but the projection would also assist in the display of UVic's connections. Very few of UVic's connections are located in the polar regions (which are emphasized in Google Maps™) and with more of the map window displaying the equatorial regions, the connections would be more visible.

The final major shortcoming of the prototype was its inability to work using Microsoft's Internet Explorer. As discussed in Section 4.5.1, the majority of people in the

world use other web browsers and the number of potential mapping application users at UVic using Internet Explorer is likely even lower than average. While this issue would require fixing before final implementation, if the prototype was going to receive more exposure, it should be adapted to Internet Explorer in order to ensure this incompatibility does not dominate the responses from people.

### **7.2.3 Debugging**

Debugging of the product (UCD stage six) is an ongoing stage of any product design. As discussed by Robinson et al. (2005), a system of automatic error tracking must be put in place, along with an easy method of user feedback. A feedback form is useful to keep track of issues and to facilitate how they are addressed. A feedback form should allow users to easily select the area of the product in which they experienced an issue, followed by the nature of the issue, and most importantly, suggestions of how to fix it. By including the option for users to suggest fixes, the UCD process continues.

### **7.3 Keeping the data current**

One of the biggest challenges in creating a mapping application of this type will be to keep all the data current. This was recognized by the researcher early in the process and was emphasized by the survey respondents and interview participants. As discussed in Sections 5.2 and 5.9, the need for continuous updates to the data was a major factor in the decision to utilize the software in use by the UVic Community Mapping Initiative.

A fundamental first step to communicating the University's international connections is to identify what information is to be communicated, and what data are required to achieve this. Key questions that must therefore be answered are:

- What data must be collected and what are the sources for these data?
- How can these data be kept current in order to not communicate stale information?
- How would a system keep these data up to date?

The above questions have underlying administrative and business decisions. The maintenance and continual updating of the application could either be the responsibility of one custodian. Alternatively, one authority could be tasked with oversight while requiring those at the source of the data to do the updating. It is beyond the scope of this thesis to identify the correct approach, if indeed there is a correct approach. Both approaches could be successful, as long as a robust system is put in place to keep the application current prior to taking it live.

This thesis can offer a suggestion. Within the current structure of the university, one authority could be identified to oversee the application. This could be the Office of International Affairs. This oversight authority should identify for each type of displayed information item the appropriate primary and/or secondary data source. A strategy could then be negotiated with these sources as to how to keep the data field current. The challenge with this approach will be to get buy in for distributed responsibility for maintaining currency of the data.

Faculty and staff interviewed as part of the survey and follow up interviews shared that they were already “too busy” and should not be expected to take responsibility for keeping information current. These groups, however, are often the primary sources for these data. Careful consideration will need to be given to incentive structures and ownership of the site. An application designed and managed by what is perceived to be a top down approach will likely not secure the interest necessary to be successful. This

research has already concluded that an open and completely community driven website using community mapping principles will also not work. The challenge will be to find a balance that will deliver a reliable product while ensuring shared ownership, and therefore shared pride. This solution should also incorporate, whenever possible, existing information collection processes to ensure current information, for example the annual three-year activity reporting process.

#### **7.4 Implications of the Research**

The primary outcome of this research is the demonstration of a “proof of concept” showcasing an opportunity for UVic to add a mapping application communicating international activities to their website. With the prototype complete, a list of further changes required identified and discussed in Section 7.2.2, and a proposed system of keeping the application up-to-date discussed in Section 7.3, UVic could realistically add a powerful mapping component to its online profile. The implications of this research on the UCD process and other mapping applications, however, are more far reaching.

##### **7.4.1 User group representatives**

The mapping application being developed was not replacing an existing product, so an exact user group was not known. Furthermore, the potential user group was so large that including everyone in the interaction and usability studies would not be practical. Dividing the potential users into homogenous groups allowed for representatives of those groups to be used in the later stages of UCD, reducing the time and expense of interaction and usability studies. This method would be very applicable to other settings and during any type of UCD process, not just for the development of mapping applications.

### **7.4.2 Development of other mapping applications**

Other implications are more specific to this type of application. As discovered during the critical review of the top universities in Canada and the world, very few universities have a comparable application to the prototype developed as part of this research. With the UCD framework, and the adaptations to the framework made during the course of this research, other universities could easily conduct a similar design process to develop a mapping application to highlight their own international connections, or any other data with a geographic component.

This research could also prove very useful to faculties or departments within the university. During the presentation of the VPAC prototype, and also during the survey interviews and workshop interviews, many participants indicated an interest in adapting the mapping application framework for other purposes. These other maps could more closely emulate a community map with the ability to capture students' experiences as part of co-op, internships or exchange programs. Adding such a blog component would be possible for a more casual application found on faculty, department, or student service type websites.

### **7.4.3 Future research**

This avenue of research is still in its infancy. With the 'democratization' of mapping, the level of interest in mapping applications steadily grows. Of particular interest would be to continue Nivala et al.'s research (2003, 2007, 2008) into developing mapping applications for handheld devices using UCD. For a university mapping application, this would be of particular interest given the number of smart phones in use amongst the

university population. This research could study methods of incorporating this population into the development process through online surveys and prototype testing accessed via mobile phones.

## **7.5 Conclusions**

The primary conclusion that can be drawn from the research presented here is that there does exist an interest in a UVic web presence that capitalizes on the power of mapping to communicate international activities. The thesis also concludes that such a website could become a reality if a number of management challenges are addressed. The research set out with the ambition to capitalize on community mapping methodologies to develop such a site. In the process of conducting the research it became obvious that a cooperative community map may not be successful, and that a more traditionally developed web mapping application may be the more realistic approach to take. This project therefore evolved from the former to the latter.

### **7.5.1 Evolution from a community map**

This research was begun with the idea of developing a mapping application for UVic based on the community mapping initiatives supported by the University. As the project developed into a more formal application with potential for becoming a prominent promotional tool for the University, the fundamental ideas of community mapping became incompatible for two primary reasons. First of all, the original goal of creating the application to be a very prominent feature of the university website meant that all data being displayed would have to be a recognized international connection, vetted by the university, and carry no message not fully supported by the university. The majority of

community maps voice strong opinions held by the creators, are a vehicle for advocacy, and typically freely available to everyone who wishes to contribute.

The second reason is time and inclination. During the surveys and workshop interviews, it became clear that for the potential users, data currency was one of the most important factors in creating the application. The issue was that staff and faculty members indicated that they did not have the time to maintain their own international connections, regardless of whether it was connections associated with their department or faculty, or even their own research. Keeping the data current will therefore require careful attention and negotiation by those tasked with the overall responsibility for the application. Even if the mapping application had a much lower level of involvement from the UVic community than a traditional community map, the enthusiasm encountered by the researcher throughout this project indicates that the mapping application could be embraced with a passion similar to that of a community map. If people have an easy method of learning about the connections created by others, new relationships could be forged and new joint connections created. A member of the UVic community may have an interest that ties closely into an existing project from another part of the University, but it could take the medium of a mapping application for the two to learn of each other and create a new connection.

### **7.5.2 Strong support for a mapping application**

Through the course of this research, a high level of interest and support was always found for the mapping application. As discussed, the voluntary nature of participation selected people interested in maps, however the interest from all user groups within the

university illustrates that there would be significant interest in having the project advance past the prototype stage. Creating a fully functioning application would provide a valuable tool for promoting the university as well as providing a valuable resource for the university population to learn about itself. If people have a tool to look beyond their office, department, or faculty to see what others are learning, new ties could be built within the university. While the map may not be a typical community map, through its realization the University of Victoria could develop a stronger community.

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## Appendix A: Human Research Ethics Board Approval



**Human Research Ethics Board**  
 Office of Research Services  
 Administrative Services Building  
 PO Box 1700 STN CSC  
 Victoria British Columbia V8W 2Y2 Canada  
 Tel 250-472-4545, Fax 250-721-8960  
 Email ethics@uvic.ca Web www.research.uvic.ca

### Certificate of Approval

|  |  |
|--|--|
| <b>PRINCIPAL INVESTIGATOR:</b> Ian Macek   | <b>ETHICS PROTOCOL NUMBER:</b> 10-307    |
| <b>UVic STATUS:</b> Master's Student   | <b>ORIGINAL APPROVAL DATE:</b> 19-Aug-10 |
| <b>UVic DEPARTMENT:</b> GEOG   | <b>APPROVED ON:</b> 19-Aug-10            |
| <b>SUPERVISOR:</b> Dr. Peter Keller  | <b>APPROVAL EXPIRY DATE:</b> 18-Aug-11   |
| <b>PROJECT TITLE:</b> Utilizing Participatory Design for UVic's International Connections Mapping Application  |  |
| <b>RESEARCH TEAM MEMBERS:</b> Patricia Maedel, Project Coordinator, UVic   |  |
| <b>DECLARED PROJECT FUNDING:</b> Office of International Affairs   |  |
| <b>CONDITIONS OF APPROVAL</b>  |  |
| <p>This Certificate of Approval is valid for the above term provided there is no change in the protocol.</p> <p><b>Modifications</b><br/>         To make any changes to the approved research procedures in your study, please submit a "Request for Modification" form. You must receive ethics approval before proceeding with your modified protocol.</p> <p><b>Renewals</b><br/>         Your ethics approval must be current for the period during which you are recruiting participants or collecting data. To renew your protocol, please submit a "Request for Renewal" form before the expiry date on your certificate. You will be sent an emailed reminder prompting you to renew your protocol about six weeks before your expiry date.</p> <p><b>Project Closures</b><br/>         When you have completed all data collection activities and will have no further contact with participants, please notify the Human Research Ethics Board by submitting a "Notice of Project Completion" form.</p> |  |
| <b>Certification</b>   |  |
| <p>This certifies that the UVic Human Research Ethics Board has examined this research protocol and concluded that, in all respects, the proposed research meets the appropriate standards of ethics as outlined by the University of Victoria Research Regulations Involving Human Participants.</p>  |  |
| <p>_____<br/>         Dr. Afzal Suleman<br/>         Associate Vice-President, Research</p>  |  |

Certificate Issued On: 20-Aug-10

10-307 Ian Macek

## Appendix B: Human Research Ethics Board Approval of Annual Renewal



**Human Research Ethics Board**  
 Office of Research Services  
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 Victoria, British Columbia V8W 2Y2, Canada  
 Tel 250-472-4545, Fax 250-721-8960  
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### Certificate of Renewed Approval

|  |                                       |
|--|---------------------------------------|
| PRINCIPAL INVESTIGATOR: <b>Ian Macek</b>   | <b>ETHICS PROTOCOL NUMBER: 10-307</b> |
| UVic STATUS: <b>Master's Student</b>   | ORIGINAL APPROVAL DATE: 19-Aug-10     |
| UVic DEPARTMENT: <b>GEOG</b>   | RENEWED ON: 17-Aug-11                 |
| SUPERVISOR: <b>Dr. Peter Keller; Dr. Ian O'Connell</b>   | APPROVAL EXPIRY DATE: 18-Aug-12       |
| PROJECT TITLE: <b>Utilizing Participatory Design for UVic's International Connections Mapping Application</b>  |                                       |
| RESEARCH TEAM MEMBERS: None  |                                       |
| DECLARED PROJECT FUNDING: <b>Office of International Affairs (previous)</b>  |                                       |
| <b>CONDITIONS OF APPROVAL</b>  |                                       |
| <p>This Certificate of Approval is valid for the above term provided there is no change in the protocol.</p> <p><b>Modifications</b><br/>         To make any changes to the approved research procedures in your study, please submit a "Request for Modification" form. You must receive ethics approval before proceeding with your modified protocol.</p> <p><b>Renewals</b><br/>         Your ethics approval must be current for the period during which you are recruiting participants or collecting data. To renew your protocol, please submit a "Request for Renewal" form before the expiry date on your certificate. You will be sent an emailed reminder prompting you to renew your protocol about six weeks before your expiry date.</p> <p><b>Project Closures</b><br/>         When you have completed all data collection activities and will have no further contact with participants, please notify the Human Research Ethics Board by submitting a "Notice of Project Completion" form.</p> |                                       |
| <b>Certification</b>   |                                       |
| <p>This certifies that the UVic Human Research Ethics Board has examined this research protocol and concluded that, in all respects, the proposed research meets the appropriate standards of ethics as outlined by the University of Victoria Research Regulations Involving Human Participants.</p>  |                                       |
| <p>_____<br/>         Dr. Rachael Scarth<br/>         Associate Vice-President, Research</p>   |                                       |

10-307 Macek, Ian

Certificate Issued On: 17-Aug-11

## Appendix C: Participant Consent Letter (for in-person surveys)

### *Participant Consent Form*

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#### **Utilizing Participatory Design for UVic's International Connections Mapping Application**

You are invited to participate in a study entitled "Utilizing participatory design for UVic's international connections mapping application" that is being conducted by Ian Macek. Ian Macek is a Graduate student in the department of Geography at the University of Victoria. You may contact him if you have further questions by email: imacek@uvic.ca, or phone: 250-896-8532.

As a Graduate student, Ian Macek is required to conduct research as part of the requirements for a Masters of Science. It is being conducted under the supervision of Dr. Peter Keller and Dr. Ian O'Connell. You may contact his supervisors at 250-472-5058 and 250-721-7338 respectively.

#### **Purpose and Objectives**

This project is being conducted for UVic through VPAC and the Office of International Affairs. The purpose of this research project is to produce an online mapping application to display UVic's many connections to the rest of the world. These connections include the many courses focusing on international subjects, research being conducted by faculty and students around the globe, and the networks developed through the international student programs. The online mapping application will be a tool to display the location of these connections on a map. By following a system of user involvement during the design process, the goal is for the end product to best represent the needs and desires of the potential users. The end product will be found on UVic's website and be used as a promotional tool for the University.

#### **Importance of this Research**

Research of this type is important because participatory design has proven to be a very effective method of designing a new product, but has not been used for the production of an online mapping application. This research will not only investigate the usefulness of participatory design for this application, but will also follow this process through to the completion of a working product.

#### **Participants Selection**

You are being asked to participate in this study because of your role at the university. The participatory design process will be most beneficial if the people who will potentially use the product can be involved during the design and testing. Your name has been suggested either by members of the research group or by other potential participants.

#### **What is involved**

If you agree to voluntarily participate in this research, your level of participation is your choice. At a minimum, you are being asked to complete an administered questionnaire. This would require approximately 30 minutes and be conducted when convenient in person at your office or a location of your choosing. As a next level of involvement, you will be asked to participate in a follow-up prototype testing workshop. The workshop would require the commitment of half a day. If you are interested in participating in the workshop, please complete and return the Workshop (Ongoing) Consent Form (attached). Participating in the administered questionnaire in no way obligates you to participate in the workshop.

#### **Compensation**

No compensation will be offered, however coffee and refreshments will be provided during the workshop, and parking will be reimbursed. The refreshments should not be the determining factor for deciding whether to participate.

#### **Inconvenience**

The inconvenience associated with participating in this research is time. The time required is outlined above.

**Risks**

There are no known or anticipated risks to you by participating in this research.

**Benefits**

The potential benefits of your participation in this research include the production of a mapping application that incorporates the features and tools that you have identified as being the most useful and beneficial to your work. By having a range of participants, this project should also result in a product that will be useful to society as a tool to learn more about UVic's international reach. Participatory design is not a new process, however as stated above, it has not been applied to producing an online mapping application. This project will test this process's applicability to this field and therefore add to the body of knowledge surrounding online cartography.

**Voluntary Participation**

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data will only be used if you give permission. A withdrawal form has been included.

**On-going Consent**

To make sure that you continue to consent to participate in this research, I have attached a withdrawal form. If at any point you wish to discontinue your participation, please complete this form. You can send it to me by email (imacek@uvic.ca) or by fax to (250) 721-6216. If you wish to participate in the prototype testing workshop, please complete the Workshop (Ongoing) Consent Form. This will allow me to retain your contact information to inform you of the date and time of the event.

**Anonymity**

All surveys will be anonymous however due to the potential for a limited number of participants in your target group, anonymity cannot be guaranteed. If you advertise your participation, people may be able to trace the results to you. In order to protect participants, all questions asked of you are voluntary, so you may exempt yourself from portions of the research at your discretion. The dissemination of the results will utilize pseudonyms to further protect your privacy.

**Confidentiality**

Your confidentiality and the confidentiality of the data will be protected by having all written data stored in a locked cabinet in the researcher's office for the duration of the project. Similarly, all electronic data will be stored in a password-protected folder on the researcher's computer.

**Dissemination of Results**

It is anticipated that the results of this study will be shared with others in the following ways. First of all, the process of participatory design involves testing of a prototype. During this testing the results from your earlier participation will be evident in the product. Secondly, the project will be written and presented as the researcher's Masters thesis. The defense of this thesis is open to the public and would therefore be available to you. Results may also be published in a recognized journal. All references to data collected from participants would be given the pseudonym "Respondent A", "Respondent B" etc. Similarly, results may be presented at an academic conference. If this occurs, references to the participants would again use pseudonyms.

**Disposal of Data**

Data from this study will be disposed of at the completion of the research and dissemination of results as outlined above. All paper copies will be shredded and all electronic data will be erased.

**Contacts**

Individuals that may be contacted regarding this study include the researcher and his supervisors as listed earlier.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researcher.

\_\_\_\_\_  
*Name of Participant*

\_\_\_\_\_  
*Signature*

\_\_\_\_\_  
*Date*

*A copy of this consent form should be retained by you, and a copy returned to the researcher.*

## Appendix D: Invitation Email

Invitation email  
Masters Research  
Ian Macek

Dear Sir or Madam,

My name is Ian Macek (imacek@uvic.ca). I am currently a graduate student in the department of Geography here at the University of Victoria. As part of my masters program, I am producing a prototype mapping application to show UVic's international connections. This project is being conducted for UVic through VPAC and the Office of International Affairs.

The research process employs participatory design. This utilizes the experience of potential users to determine the design features of the final product. By incorporating potential users, the product will be more in line with user demands and therefore improve utility, usability, and efficiency. This process will lead to the maps being more heavily used.

As a potential user, your expertise and background would be valuable in the research for this product. Your involvement could be as little as a 30 minute survey conducted in person at your convenience. You would also have the opportunity to participate in a ½ day workshop to test the prototype. At the workshop, you would be asked to examine the design, features, and to offer feedback for revisions. This workshop will occur later in 2010.

This project is completely voluntary and you can be discontinued at any time. This research has the approval of both of my supervisors (Dr. Peter Keller and Dr. Ian O'Connell) as well as the University of Victoria Human Research Ethics Board and the Office of International Affairs.

If you wish to participate, please complete the attached consent form and return it via email (imacek@uvic.ca) or by fax (250-721-6216). Attached also is a withdrawal form. If at any time you wish to discontinue participation, please complete and return this form.

This research is only as valuable as the input I receive. Your participation will be greatly appreciated and beneficial to UVic's goal of displaying how we are connected to the rest of the world.

Thank you for your time and attention in this matter.

Sincerely,

Ian Macek

If there is someone you think would also be a valuable participant in this research, please forward him or her this complete package.

## Appendix E: Recruitment Presentation Script

Recruitment Presentation Script  
Masters Research  
Ian Macek

### Utilizing Participatory Design for UVic's International Connections Mapping Application

(If I am presenting)

Thank you for giving me the time to talk to you. I am a grad student here at UVic, doing my Masters in the Department of Geography.

I am studying how to incorporate end users into the design of an online mapping application. This process of participatory design ensures that the end product maximizes usability and functionality.

The maps being developed will display UVic's international connections. These connections include research locations, partner universities, exchange locations, coop placements and work study locations.

This project is being conducted through UVic's Office of International Affairs.

One of the target groups for my research is you - undergraduate students who may have an interest in maps, and may want to look at where UVic is connected to the world.

What I am asking for is for you to please complete an online survey that would require about 15-20 minutes. It can be completed anywhere at any time.

I have a flyer for each of you with the link to the survey and the survey password.

I want to thank you in advance for taking the time to help develop this product.

This project depends on your participation.

(If a faculty member is presenting)

A flyer is being circulated with a link to a survey being conducted by Ian Macek, a grad student in the Department of Geography here at UVic. He is studying how to incorporate end users into the design of an online mapping application being made for the Office of International Affairs.

He is asking for you to complete a 15-20 minute survey that will influence the design of the maps.

## Appendix F: Withdrawal Request Form

Withdrawal request form  
Masters Research  
Ian Macek

### Utilizing Participatory Design for UVic's International Connections Mapping Application

#### Withdrawal Request Form

By completing and returning this form, you are requesting to be removed from Ian Macek's research into developing a new online mapping application. You may withdraw at any point, and need not provide explanation or reasons.

#### Your Data

Please indicate one of the following:

- I would like all information provided to the researcher to be destroyed. This includes all electronic data, written data, and emails.
- The information I have previously provided may continue to be used in the research in accordance with the consent form.

\_\_\_\_\_  
*Name of Participant*

\_\_\_\_\_  
*Signature*

\_\_\_\_\_  
*Date*

*A copy of this consent form should be retained by you, and a copy returned to the researcher.*

## Appendix G: Workshop (Ongoing) Consent Form

Workshop (Ongoing) Consent  
Masters Research  
Ian Macek

### Utilizing Participatory Design for UVic's International Connections Mapping Application

#### Workshop (Ongoing) Consent Form

By completing and returning this form, you are indicating that you are interested in participating in a workshop to test a prototype version of the online mapping application. This workshop will happen during a morning and should take approximately three hours. It will occur later in 2010, and will take place on the University of Victoria campus. This form will only indicate your interest, which will be followed by an invitation to participate when a date and time have been chosen. By indicating your interest, you authorize the researcher to retain your name and contact information as means of contacting you in the future.

Please be aware that audio recordings will be made during the workshop to ensure the completeness of data from discussions and responses. All participants will be asked to complete a Release to Use Audio Recordings at the beginning of the workshop.

Please indicate one of the following:

I am interested in participating. Please retain my name and contact information to keep me informed as to the date and time of the workshop.

I am not interested in participating.

\_\_\_\_\_

*Name of Participant*

\_\_\_\_\_

*Signature*

\_\_\_\_\_

*Date*

*A copy of this consent form should be retained by you, and a copy returned to the researcher.*

## Appendix H: Promotional Flyer

# **PARTICIPATORY DESIGN FOR UVIC'S INTERNATIONAL CONNECTIONS MAPPING APPLICATION**



Please complete the 15 minute online survey at:  
<http://fluidsurveys.com/surveys/ian-p/mapping>  
Password: ILikeHelping

THANK YOU VERY MUCH FOR YOUR TIME - THIS PROJECT  
DEPENDS ON YOUR PARTICIPATION

If you have any questions, please contact Ian Macek at [imacek@uvic.ca](mailto:imacek@uvic.ca)  
UVic Department of Geography



## Appendix J: Survey Questions and Layout

0%



### Participatory Design for UVic's International Connections Mapping Application

Please read the following letter of implied consent. This letter is a requirement for all participatory research being conducted at the University of Victoria.

Clicking "Next" at the bottom of the page indicates you have read and agree to participate in this survey. If at any point you choose to discontinue the survey, please use one of the options at the bottom of every page.

#### Utilizing Participatory Design for UVic's International Connections Mapping Application

You are invited to participate in a study entitled "Utilizing participatory design for UVic's international connections mapping application" that is being conducted by Ian Macek. Ian Macek is a Graduate student in the department of Geography at the University of Victoria. You may contact him if you have further questions by email: imacek@uvic.ca.

As a Graduate student, Ian Macek is required to conduct research as part of the requirements for a Masters of Science. It is being conducted under the supervision of Dr. Peter Keller and Dr. Ian O'Connell. You may contact his supervisors at 250-472-5058 and 250-721-7338 respectively.

#### Purpose and Objectives

This project is being conducted for UVic through VPAC and the Office of International Affairs. The purpose of this research project is to produce an online mapping application to display UVic's many connections to the rest of the world. These connections include courses focusing on international subjects, research being conducted by faculty and students around the globe, partner universities, exchange locations, co-op locations and work study locations. The online mapping application will be a tool to display the location of these connections on a map. By following a system of user involvement during the design process, the goal is for the end product to best represent the needs and desires of the potential users. The end product will be found on UVic's website and be used as a promotional tool for the University.

#### Importance of this Research

Research of this type is important because participatory design has proven to be a very effective method of designing a new product, but has not been used for the production of an online mapping application. This research will not only investigate the usefulness of participatory design for this application, but will also follow this process through to the completion of a working product.

#### Participants Selection

You are being asked to participate in this study because of the potential for you to use this application in the future. The participatory design process will be most beneficial if the people who will potentially use the product can be involved during the design and testing.

#### What is Involved

If you agree to voluntarily participate in this research, your participation would involve answering a 15-minute online survey regarding your computer use, your exposure to maps or atlases and your ideas about the design of the mapping application. This can be completed from any location at any time.

At the completion of the online survey, you will be asked if you are interested in participating in a future prototype-testing workshop. This workshop will occur in March or April 2010. If you express interest in this workshop, an email outlining your participation will be sent to you.

#### Compensation

No compensation will be offered for you to complete the online survey.

#### Inconvenience

Inconveniences associated with participating in this research is time. The time required is outlined above.

#### Risks

There are no known or anticipated risks to you by participating in this research.

#### Benefits

The potential benefits of your participation in this research include the production of a mapping application that incorporates the features and tools that you have identified as being the most useful and beneficial to you. By having a range of participants, this project should also result in a product that will be useful to society as a tool to learn more about UVic's international reach. Participatory design is not a new process, however as stated above, it has not been applied to producing an online mapping application. This project will test this process's applicability to this field and therefore add to the body of knowledge surrounding online cartography.

#### **Voluntary Participation**

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study, your data will only be used if you give permission. At the bottom of every page of the online survey you are offered the choice of withdrawing.

#### **On-going Consent**

To make sure that you continue to consent to participate in this research, withdrawal options are provided to you on every page of the online survey. If you wish to discontinue your participation, please select one of the options provided. Upon completion of the survey, please note the time of submission. If at any point after submitting your data, you wish for your data to be removed from the research, contact the researcher by any method (anonymously if you choose) with the date and time of submission and your data will be removed. No reason need be given.

If you wish to participate in the prototype testing workshop, please email the researcher. A reply will be sent with a Workshop (Ongoing) Consent Form. Completing and returning this form will allow me to retain your contact information to inform you of the date and time of the event.

#### **Anonymity**

In terms of protecting your anonymity, all surveys will be anonymous. In order to protect participants, all questions asked of you are voluntary, so you may exempt yourself from portions of the research at your discretion. The dissemination of the results will utilize pseudonyms (such as Respondent A, Respondent B etc) to further protect your privacy.

#### **Confidentiality**

Your confidentiality and the confidentiality of the data will be protected by having all written data stored in a locked cabinet in the researcher's office for the duration of the project. Similarly, all electronic data will be stored in a password-protected folder on the researcher's computer.

#### **Dissemination of Results**

It is anticipated that the results of this study will be shared with others in the following ways. First of all, the process of participatory design involves testing of a prototype. During this testing the results from your earlier participation will be evident in the product. Secondly, the project will be written and presented as the researcher's Masters thesis. The defense of this thesis is open to the public and would therefore be available to you. Results may also be published in a recognized journal. All references to data collected from participants would be given the pseudonym "Respondent A", "Respondent B" etc. Similarly, results may be presented at an academic conference. If this occurs, references to the participants would again use pseudonyms.

#### **Disposal of Data**

Data from this study will be disposed of at the completion of the research and dissemination of results as outlined above. All paper copies will be shredded and all electronic data will be erased.

#### **Contacts**

Individuals that may be contacted regarding this study include the researcher and his supervisors as listed earlier.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or [ethics@uvic.ca](mailto:ethics@uvic.ca)).

By completing and submitting the survey, YOUR FREE AND INFORMED CONSENT IS IMPLIED and indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researcher.

*Please retain a copy of this letter for your reference.*

Next

10%



**Participatory Design  
for  
UVic's International Connections Mapping Application**

I am designing a mapping application for UVic to display the university's many international connections. The type of connections to be included are co-op locations, exchange locations, partner universities, research locations, UVic courses with international subject material, and UVic research centres' international projects (for example the Centre for Asia-Pacific Initiatives).

How interested are you in each of these types of connections?

|   | Very interested       | Somewhat interested   | Not interested        | No opinion            |
|---|-----------------------|-----------------------|-----------------------|-----------------------|
| Co-op locations                               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Student exchange locations                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Faculty exchange locations                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Partner universities                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Research locations                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| UVic courses with international subjects      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| UVic research centres' international projects | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Use the scale "Essential", "Nice to have", "Do not include", and "No opinion", to rank how important the inclusion of each of the following is to the connection being mapped.

|                          | Essential             | Nice to have          | Do not include        | No opinion            |
|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Names of people involved | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Contact information      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|  | Essential             | Nice to have          | Do not include        | No opinion            |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Short descriptions                                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Links to related information                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Information about the number of UVic students involved | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Photographs  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Videos   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

---

There are a number of ways to display the data being included in the online mapping application.

Please rank the following as "Essential", "Nice to have", "Do not include", or "No opinion".

|  | Essential             | Nice to have          | Do not include        | No opinion            |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Ability to print screen                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ability to display a single UVic department      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ability to display a single country              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ability to display data in conventional database | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

If you do not want any of your responses to be included in the research, a choice is provided on the final page to remove your data.

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20%



## Participatory Design for UVic's International Connections Mapping Application

**If you were interested in finding all of UVic's Geography department research sites in Thailand, what would be your preferred method for retrieving this information?**

Clicking on any of the following images will open the full-size image in a new window.  
Close the new window to return.

Data table

| ID | Name | Address           | City | Country | Latitude | Longitude |
|----|------|-------------------|------|---------|----------|-----------|
| 1  | UVic | 1800 ST JASPER ST | UVIC | CANADA  | 48.46    | -123.31   |
| 2  | UVic | 1800 ST JASPER ST | UVIC | CANADA  | 48.46    | -123.31   |
| 3  | UVic | 1800 ST JASPER ST | UVIC | CANADA  | 48.46    | -123.31   |
| 4  | UVic | 1800 ST JASPER ST | UVIC | CANADA  | 48.46    | -123.31   |
| 5  | UVic | 1800 ST JASPER ST | UVIC | CANADA  | 48.46    | -123.31   |
| 6  | UVic | 1800 ST JASPER ST | UVIC | CANADA  | 48.46    | -123.31   |
| 7  | UVic | 1800 ST JASPER ST | UVIC | CANADA  | 48.46    | -123.31   |
| 8  | UVic | 1800 ST JASPER ST | UVIC | CANADA  | 48.46    | -123.31   |
| 9  | UVic | 1800 ST JASPER ST | UVIC | CANADA  | 48.46    | -123.31   |
| 10 | UVic | 1800 ST JASPER ST | UVIC | CANADA  | 48.46    | -123.31   |

Dropdown menus

Please use the menus to retrieve your chosen information.

Type of connection: Research Sites (2)

Faculty: Geography (2)

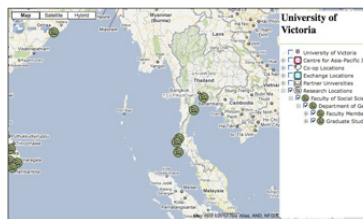
Department: Geography (2)

Country: Asia (2)

City: Bangkok (2)

Country: Thailand (2)

Markers on a map



- Data table
- Dropdown menus
- Markers on a map
- No opinion

If you do not want any of your responses to be included in the research, a choice is provided on the final page to remove your data.

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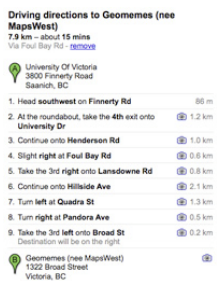
**Participatory Design  
for  
UVic's International Connections Mapping Application**

The next set of questions ask about your general preferences and uses of maps and atlases.

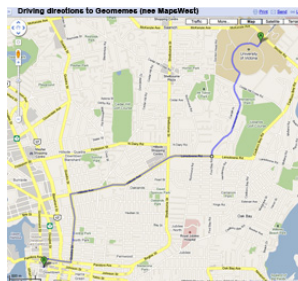
**If you were driving to an unfamiliar location, which would you prefer to use?**

Clicking on any of the following images will open the full-size image in a new window.  
Close the new window to return.

Written directions



Map with drawn route



- Written directions
- Map with drawn route
- No preference

**Do you regularly use a map as a source of information?**

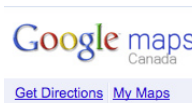
- Yes
- No

**If you need to use a map, to which source would you more likely turn?**

Paper map or atlas



Online map or atlas



- Paper map or atlas

- Online map or atlas
- No opinion

**If you use online maps or atlases, what is your favourite feature?**

**If you use online maps or atlases, is there anything about them that you find frustrating?**

If you do not want any of your responses to be included in the research, a choice is provided on the final page to remove your data.

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**Participatory Design  
for  
UVic's International Connections Mapping Application**

One of the maps in this application will use a system of categorized flags on a world map to display all of UVic's international connections. This will likely have a similar appearance to Google's map system.

If you were to use a world map, which type do you prefer?

Choice 1



Choice 2



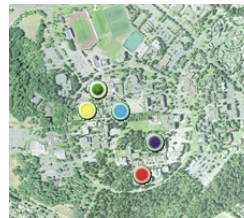
- Choice 1
- Choice 2
- The application should give me both choices
- No opinion

If you were to use a detailed map, such as one of the UVic campus, which do you prefer?

Choice 1



Choice 2



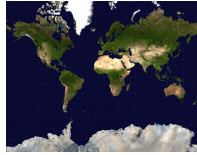
- Choice 1
- Choice 2
- The application should give me both choices
- No opinion

Do you understand what is meant by a map projection?

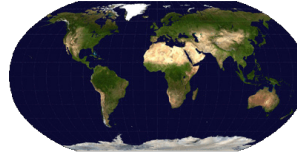
- Yes
- No

Which of the following images of the world would you most prefer for the world map?

Square version



Rounded version



- Square version
- Rounded version
- No opinion

If you do not want any of your responses to be included in the research, a choice is provided on the final page to remove your data.

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50%



### Participatory Design for UVic's International Connections Mapping Application

Choose the level to which you agree or disagree with the following statements:

I prefer to use maps that include as many details as possible.

|                       |                       |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Strongly agree        | Somewhat agree        | Neutral               | Somewhat disagree     | Strongly disagree     | No opinion            |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I prefer to start with a basic empty map and add detail as needed.

|                       |                       |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Strongly agree        | Somewhat agree        | Neutral               | Somewhat disagree     | Strongly disagree     | No opinion            |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I prefer to start with a very detailed map and remove detail as needed.

|                       |                       |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Strongly agree        | Somewhat agree        | Neutral               | Somewhat disagree     | Strongly disagree     | No opinion            |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I prefer to use applications with 3-dimensional displays when possible.

|                       |                       |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Strongly agree        | Somewhat agree        | Neutral               | Somewhat disagree     | Strongly disagree     | No opinion            |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I prefer to use applications with animation when possible.

|                       |                       |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Strongly agree        | Somewhat agree        | Neutral               | Somewhat disagree     | Strongly disagree     | No opinion            |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I prefer to use open source (free) software rather than proprietary software whenever feasible.

|                       |                       |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Strongly agree        | Somewhat agree        | Neutral               | Somewhat disagree     | Strongly disagree     | No opinion            |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

If you do not want any of your responses to be included in the research, a choice is provided on the final page to remove your data.

60%



**Participatory Design  
for  
UVic's International Connections Mapping Application**

On average, how often do you use the following software or applications?

|                          | Hourly                | Daily                 | Weekly                | A few times per month | A few times per year  | Almost never          | Never                 |
|--------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Email                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Web browser              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Social media             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Entertainment            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Office functions         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Photo organizing/editing | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Are there any other types of software or applications that you frequently use?

Have you ever assisted in the managing of web content such as a wiki (for example wikipedia), a blog, or other methods of presenting online data?

- Yes
- No

Are there any software programs that you have stopped using because of frustration?

- Yes
- No

If yes, which one?

Have you downloaded a web browser plug-in?



[Click here to download plugin.](#)

- Yes
- No

Do you consider this to be a nuisance?

- Yes
- No

**If yes, why?**

**Have you ever abandoned an activity because it required a plug-in to be downloaded?**

- Yes
- No

If you do not want any of your responses to be included in the research, a choice is provided on the final page to remove your data.

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**Participatory Design  
for  
UVic's International Connections Mapping Application**

**The next three questions refer to the computer that you use the most:**  
Multiple answers are acceptable if you commonly use more than one computer.

**What size and style is your computer monitor?**

Small laptop



Regular laptop



Large laptop



Small/old monitor



New-ish flat monitor



Very large monitor



- Small laptop
- Regular laptop
- Large laptop
- Small/old monitor
- New-ish flat monitor
- Very large flat monitor
- Not sure

**What type of monitor do you have?**

Normal



Widescreen



- Normal
- Widescreen

Not sure

**Do you use dual monitors?**

Single



Dual



- Single
- Dual
- Not sure

**Do you use a Mac or a PC?**

- Mac
- PC

**Would you consider using a small handheld device (for example a cellphone) to explore an online mapping application?**



- Yes
- No - why not?

If you do not want any of your responses to be included in the research, a choice is provided on the final page to remove your data.

80%



**Participatory Design  
for  
UVic's International Connections Mapping Application**

**In which group do you consider yourself to be?**

- Administration
- Staff
- Faculty
- Graduate Students
- Undergraduate Students
- Alumni
- Public

If you do not want any of your responses to be included in the research, a choice is provided on the final page to remove your data.

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[Survey Software](#) powered by FluidSurveys

90%



## Participatory Design for UVic's International Connections Mapping Application

### Final Thoughts:

Are there any additional comments that you would like to make?

There will be a followup workshop to test a prototype mapping application. If you are interested in participating, please email Ian Macek at [imacek@uvic.ca](mailto:imacek@uvic.ca).

Please note: emailing the researcher does not connect you or your email address to your survey responses. Your survey responses will always remain completely anonymous and confidential.

The research resulting from this survey would be aided significantly if you could encourage others to also complete this survey. These can either be other members of the UVic community or from outside the university. This research would especially benefit from input by the public. This can be family members, friends, or colleagues.

To email the survey link and password to someone, please [Click Here](#).

The link is: <http://fluidsurveys.com/surveys/ian-p/mapping/>

Password: ILikeHelping

Please note: emailing the survey information to someone else will not connect their participation or responses to yours nor will it attach you or your email address to your survey responses. Your survey responses will always remain completely anonymous and confidential.

If you have decided that you do not wish to participate in the research please select the option below. Otherwise please click the submit button.

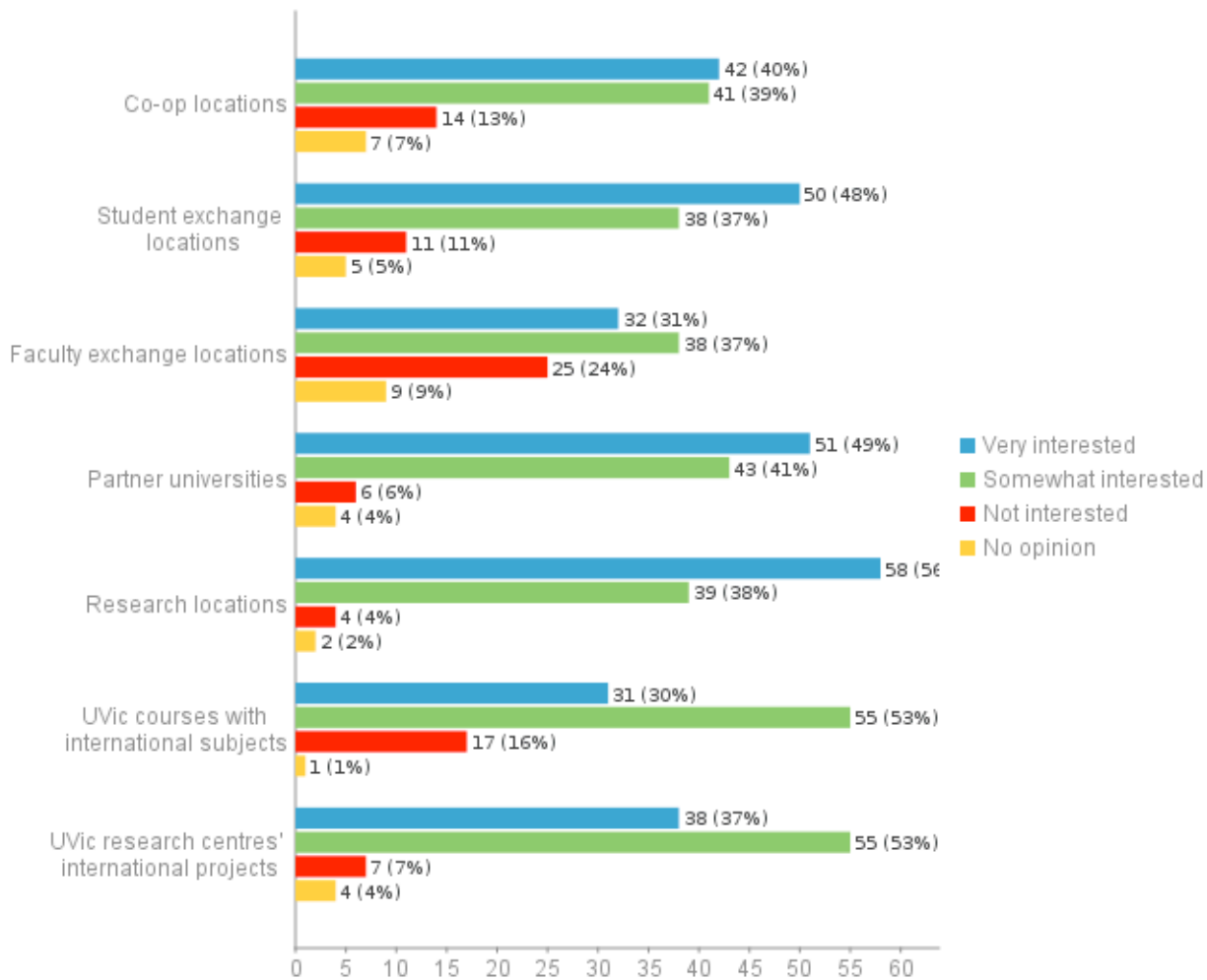
- Do not include my data in the research.
- Include my data in the research.

To complete the survey, click "Submit"

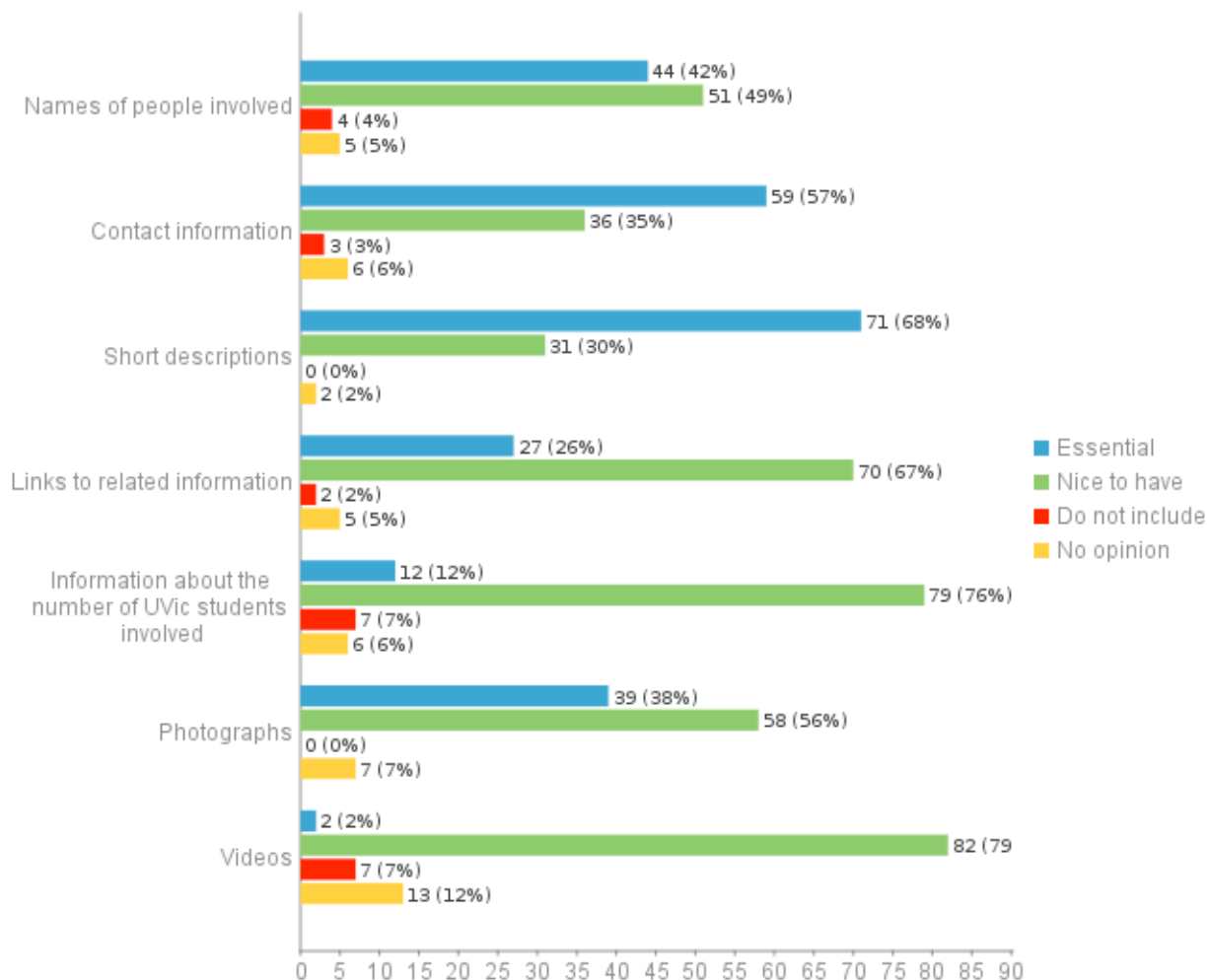
[Back](#) [Submit](#)

## Appendix K: Complete Survey Results

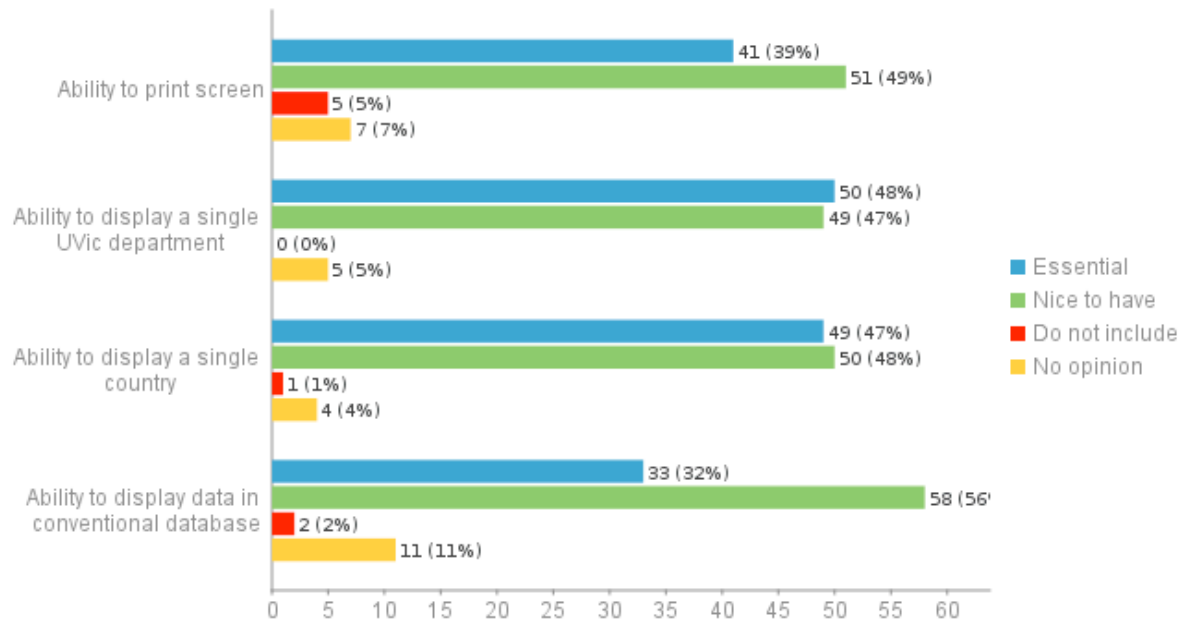
How interested are you in each of these types of connections?



Use the scale "Essential", "Nice to have", "Do not include", or "No opinion", to rank how important the inclusion of each of the following is to the connection being mapped.



There are a number of ways to display the data being included in the online mapping application. Please rank the following as "Essential", "Nice to have", "Do not include", or "No opinion".





If you were interested in finding all of UVic's Geography department research sites in Thailand, what would be your preferred method for retrieving this information?

| Response               | Chart | Percentage | Count      |
|------------------------|-------|------------|------------|
| Data table             |       | 5%         | 5          |
| Dropdown menus         |       | 16%        | 16         |
| Markers on a map       |       | 77%        | 79         |
| No opinion             |       | 3%         | 3          |
| <b>Total Responses</b> |       |            | <b>103</b> |




If you were driving to an unfamiliar location, which would you prefer to use?

| Response               | Chart | Percentage | Count      |
|------------------------|-------|------------|------------|
| Written directions     |       | 17%        | 18         |
| Map with drawn route   |       | 79%        | 81         |
| No preference          |       | 4%         | 4          |
| <b>Total Responses</b> |       |            | <b>103</b> |

Do you regularly use a map as a source of information?

| Response | Chart   | Percentage             | Count      |
|----------|---|------------------------|------------|
| Yes      |  | 99%                    | 101        |
| No       |  | 1%                     | 1          |
|          |   | <b>Total Responses</b> | <b>102</b> |

If you need to use a map, to which source would you more likely turn?

| Response            | Chart   | Percentage             | Count      |
|---------------------|---|------------------------|------------|
| Paper map or atlas  |  | 6%                     | 6          |
| Online map or atlas |  | 78%                    | 80         |
| No opinion          |  | 17%                    | 17         |
|                     |   | <b>Total Responses</b> | <b>103</b> |

If you use online maps or atlases, what is your favourite feature?

| #   | Response   |
|-----|--|
| 1.  | I use both and getting info on my phone is a plus          |
| 2.  | Google zoom  |
| 3.  | Available quickly  |
| 4.  | interactivity  |
| 5.  | I can see the roads and it is explained better.            |
| 6.  | not having to fold them back up                            |
| 7.  | getting distances and travel times                         |
| 8.  | Route finder   |
| 9.  | Ability to zoom in and out, print map & directions         |
| 10. | satellite view option                                      |
| 11. | route information  |
| 12. | Zoom capabilities  |
| 13. | map of specific driving directions from point A to point B |
| 14. | printable directions with visual on map                    |

|   |
|---|
| 15. Written directions from a specific location   |
| 16. being able to redirect the route  |
| 17. Ability to search by names of shops/street addresses/etc  |
| 18. that i can take my digital map with me in my pocket (iphone)!   |
| 19. The precise location on a street is indicated.  |
| 20. being able to see the exact location on the map   |
| 21. automatic zooming, route points are given, main roads.  |
| 22. Google Maps versatility   |
| 23. Figuring out route either by vehicle or by foot.  |
| 24. zooming   |
| 25. customability, panning and zooming, interactivity (additional information appearing in rollover windows)  |
| 26. ability to pull up different information and layers   |
| 27. directions for alternative transit (bus, bike, walking) routes  |
| 28. Pictures of locations   |
| 29. getting directions  |
| 30. accessibility   |
| 31. search  |
| 32. Adjustable Zoom   |
| 33. ability to zoom, context really easily - zooming out is almost more important than zooming in   |
| 34. Options for walking or driving directions/time estimate   |
| 35. zooming. getting perspective. getting the needed detail and then zooming out to get perspective. landmarks.   |
| 36. Route marked between start and end  |
| 37. zooming. big picture as well as close in detail.  |
| 38. the visual image is good - satellite images and streetview  |
| 39. ability to visualize routes as well as get written directions, graphical visual display - clearly interpreted, ability to add and remove detail, zoom |
| 40. ability to focus in specified area  |
| 41. streetview, like to see where you're going  |
| 42. distance calculator   |
| 43. Modification of route (Google maps)   |

|   |
|---|
| 44. street view   |
| 45. google  |
| 46. Being able to see it visually, being able to switch between map mode and satellite, and being able to get directions  |
| 47. layered map with satellite/aerial photos layered with street vectors and names  |
| 48. Easy shifting between different styles of imaging... ie maps-sattelite imagery.   |
| 49. scale change  |
| 50. Simple to use, fast results.  |
| 51. being able to zoom in on specific locations and scroll across a map, also using the feature which shows multiple routes to your destination from a starting point |
| 52. Finds the quickest route  |
| 53. The ability to zoom in and out  |
| 54. step by step directions!  |
| 55. Street View, accessible zoom in and out (change of scale), search tool  |
| 56. Google maps   |
| 57. street view   |
| 58. they can be printed and they can mark your destination and tell you the distance between them   |
| 59. Zoom to see detail, ability to move to adjacent areas   |
| 60. Being about to enter destinations and instantly know how to get there and how much time it will take. Street view in Goodle maps.                                 |
| 61. street view   |
| 62. Ability to find more info if necessary  |
| 63. seamless, can toggle between satellite/map/terrain  |
| 64. StreetView  |
| 65. zoom, satelite imagery  |
| 66. Google  |
| 67. It is quick and easy.   |
| 68. Browsing surrounding areas/data   |
| 69. Orthophotos, Interactivity  |
| 70. being able to save the map, route etc   |
| 71. Estimated distances (leg time and total)  |
| 72. Customization   |

|     |   |
|-----|---|
| 73. | quick and easy to search, easy to get directions from pt. A to point B., and very easy to add stops along the way |
| 74. | get directions via car, bus route, walking, cycling; ability to search by facility name or address                |
| 75. | directions  |
| 76. | zoom  |
| 77. | zooming   |
| 78. | Google maps   |
| 79. | Freedom of information  |
| 80. | adjustability and customization   |
| 81. | accessibility   |
| 82. | No need to find location.   |
| 83. | Searchability   |
| 84. | zooming in  |
| 85. | zoom  |
| 86. | easy to get details of the surrounding area   |
| 87. | ability to get a good context   |
| 88. | zoom  |
| 89. | Google, of course!!!  |

If you use online maps or atlases, is there anything about them that you find frustrating?



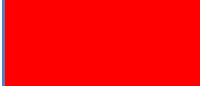

| #   | Response  |
|-----|---|
| 1.  | Not always accurate   |
| 2.  | when they can't find what I am looking for  |
| 3.  | Computer screen too small, need to scroll or zoom in/out  |
| 4.  | sometimes directions given are not the best route to take   |
| 5.  | At google there is only 3 ways to travel, car, train and by walk. Here we need another way that is ship or bus. |
| 6.  | no  |
| 7.  | when they are inaccurate  |
| 8.  | You cannot modify routes easily using point & click options   |
| 9.  | when it tells me to turn at an intersection that you can't turn at.   |
| 10. | i've never found an application that lets you set start/end point by clicking a location on the                 |

|  |
|--|
| map. Having that option rather than always having to input an address would be useful.   |
| 11. Inaccuracies   |
| 12. when multiple map markers so tightly clustered together that clicking on individual ones is annoying   |
| 13. trying to customize route if my preferred route is not the one suggested by the website  |
| 14. Lack of detail when you zoom out   |
| 15. doesn't always show public transit options   |
| 16. Desired location not visible at a level of zoom that allows you to plan a route easily.  |
| 17. it is REALLY helpful to see if streets are one way, particularly in big cities   |
| 18. nothing  |
| 19. takes too long load images and maps  |
| 20. printing functions are often poor. inaccuracies  |
| 21. functionality of the zoom function   |
| 22. if you search one particular business, often Google will show you 6 different locations for it (and you have to figure out which one is the one you're actually looking for; ex. Open Space Gallery) |
| 23. mapping directions with multiple destinations  |
| 24. not that I can think of  |
| 25. sometimes they don't display all the names of streets or places  |
| 26. ones that still use old and slow technologies  |
| 27. Nope.  |
| 28. Changing the route manually  |
| 29. if the map is not finely tuned enough - functionality concerns. a lot of time spent getting lost in the map. too much extra information, irrelevant information.                                     |
| 30. No   |
| 31. if the map is incorrect or if it is lacking specific details. so if the maps are not oriented in the direction that is logical   |
| 32. difficulties in centering maps and zooming properly - software will zoom too quickly or shift to the side too far  |
| 33. zooming in and out to get right dimensions   |
| 34. not as intuitive as they could be  |
| 35. Some are out of date and do not have all routes available  |
| 36. Printing full coverage so that it is legible   |
| 37. not being able to enter address  |



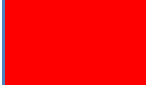
|     |   |
|-----|---|
| 38. | slow loading times, unresolved detail   |
| 39. | loading time/ large files   |
| 40. | slow or unwieldy changing between scales, though I realize this is likely related to the computer's processing power and internet connection.                         |
| 41. | time it takes for map to buffer   |
| 42. | nope  |
| 43. | not updated frequently enough with street changes etc   |
| 44. | They work fairly well for me but are sometimes a little inaccurate  |
| 45. | Proportional distance is often inaccurate (can't depend visually on distance between roads, for example)  |
| 46. | sometimes the directions given are completely off   |
| 47. | nothing that i remember-when they first came out, they were sometimes missing the newer roads but haven't encountered in awhile                                       |
| 48. | requires an internet connection, portability  |
| 49. | wrong or confusing directions   |
| 50. | slow download times and having the wrong location come up in a search   |
| 51. | paper is hard to fold   |
| 52. | Don't use often enough  |
| 53. | sometimes zoom features get out of hand, also slide around too much on occasion,  |
| 54. | The route given is not always the fastest or most efficient way to get from point A to point B  |
| 55. | need a computer - don't have a smartphone   |
| 56. | inconsistent availability of high resolution imagery  |
| 57. | If they don't have a pan option.  |
| 58. | overly complicated UI   |
| 59. | Data accuracy, spatial resolution of orthophotos  |
| 60. | I don't like having to type specific municipality names (In Google maps, if I incorrectly search for 'Victoria' as the city on a Saanich address there is no result). |
| 61. | No one source for all the options I like  |
| 62. | sometimes the time taken to load information is too long  |
| 63. | Lack of freedom of information on major mapping sites   |
| 64. | hard to access when not on line!  |
| 65. | Sometime the directions are inaccurate  |
| 66. | Distance calculation off and wrong placement of feature.  |

|                                     |
|-------------------------------------|
| 67. Zooming in and out              |
| 68. some navigational difficulty    |
| 69. hard to control level of detail |
| 70. take too long to load           |



If you were to use a world map, which type do you prefer?

| Response                                    | Chart   | Percentage | Count      |
|---|---|------------|------------|
| Choice 1                                    |  | 20%        | 21         |
| Choice 2                                    |  | 17%        | 18         |
| The application should give me both choices |  | 57%        | 59         |
| No opinion                                  |  | 5%         | 5          |
| <b>Total Responses</b>                      |   |            | <b>103</b> |




If you were to use a detailed map, such as one of the UVic campus, which do you prefer?

| Response                                    | Chart   | Percentage | Count      |
|---|---|------------|------------|
| Choice 1                                    |  | 49%        | 50         |
| Choice 2                                    |  | 9%         | 9          |
| The application should give me both choices |  | 42%        | 43         |
| No opinion                                  |   | 1%         | 1          |
| <b>Total Responses</b>                      |   |            | <b>103</b> |

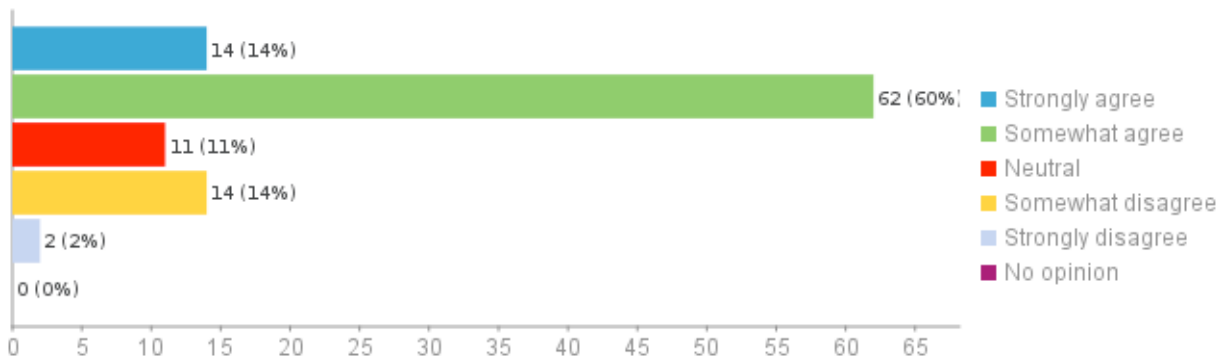
Do you understand what is meant by a map projection?

| Response               | Chart   | Percentage | Count      |
|------------------------|---|------------|------------|
| Yes                    |  | 67%        | 68         |
| No                     |  | 33%        | 33         |
| <b>Total Responses</b> |   |            | <b>101</b> |

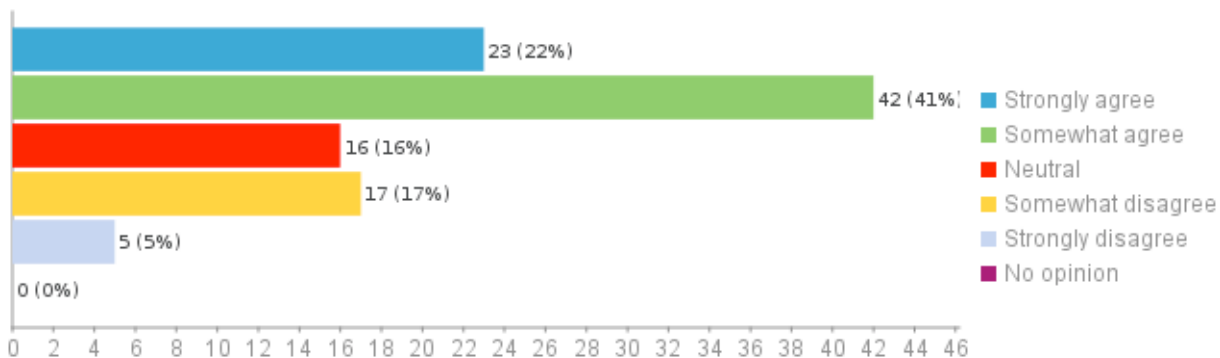
Which of the following images of the world would you most prefer for the world map?

| Response               | Chart   | Percentage | Count      |
|------------------------|---|------------|------------|
| Square version         |  | 15%        | 15         |
| Rounded version        |  | 72%        | 74         |
| No opinion             |  | 14%        | 14         |
| <b>Total Responses</b> |   |            | <b>103</b> |

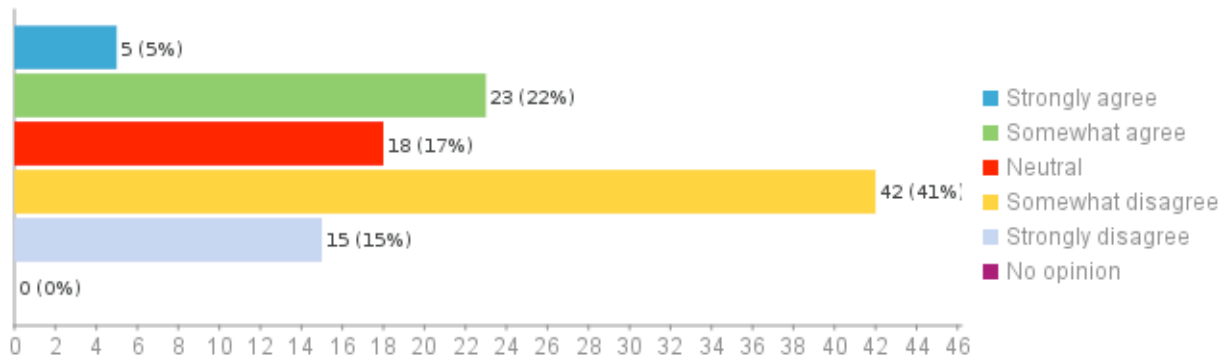
I prefer to use maps that include as many details as possible.



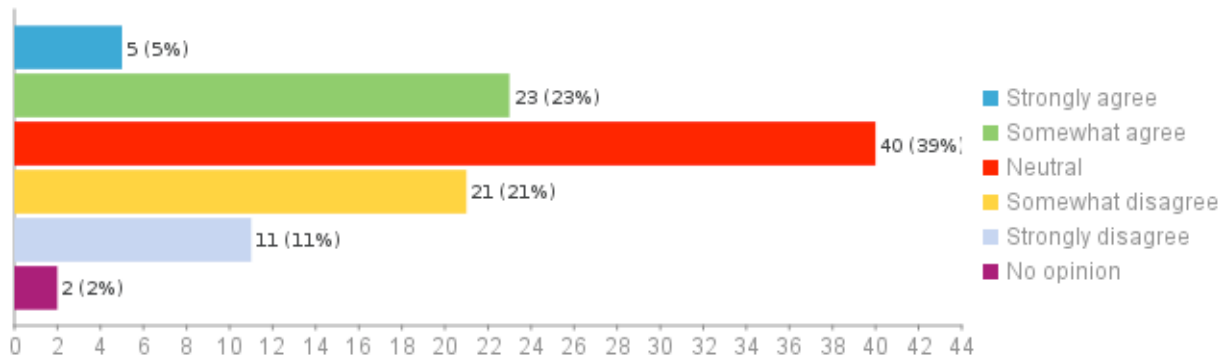
I prefer to start with a basic empty map and add detail as needed.



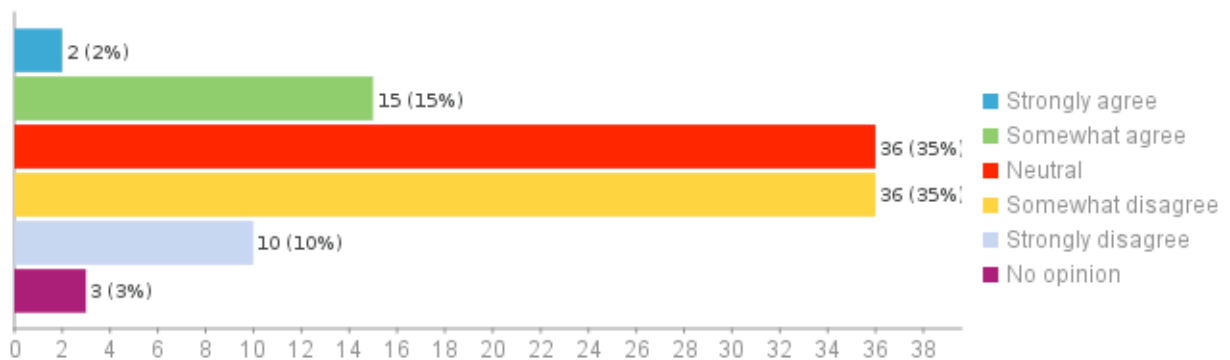
I prefer to start with a very detailed map and remove detail as needed.



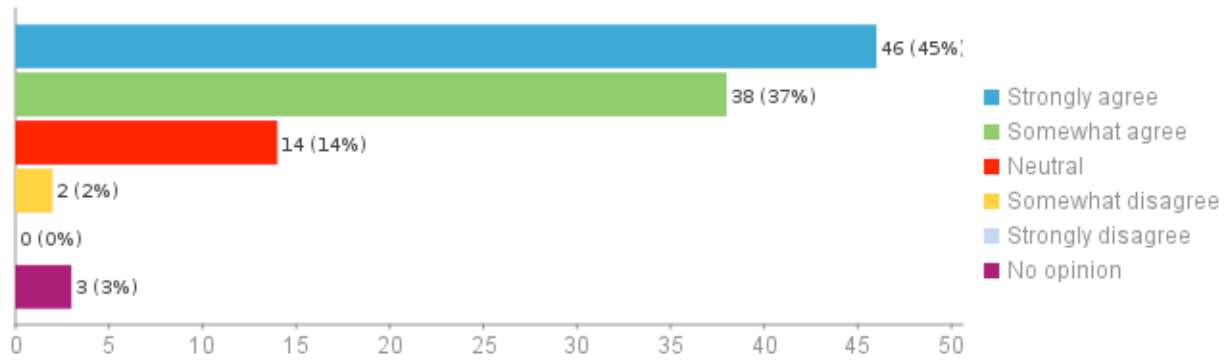
I prefer to use applications with 3-dimensional displays when possible.



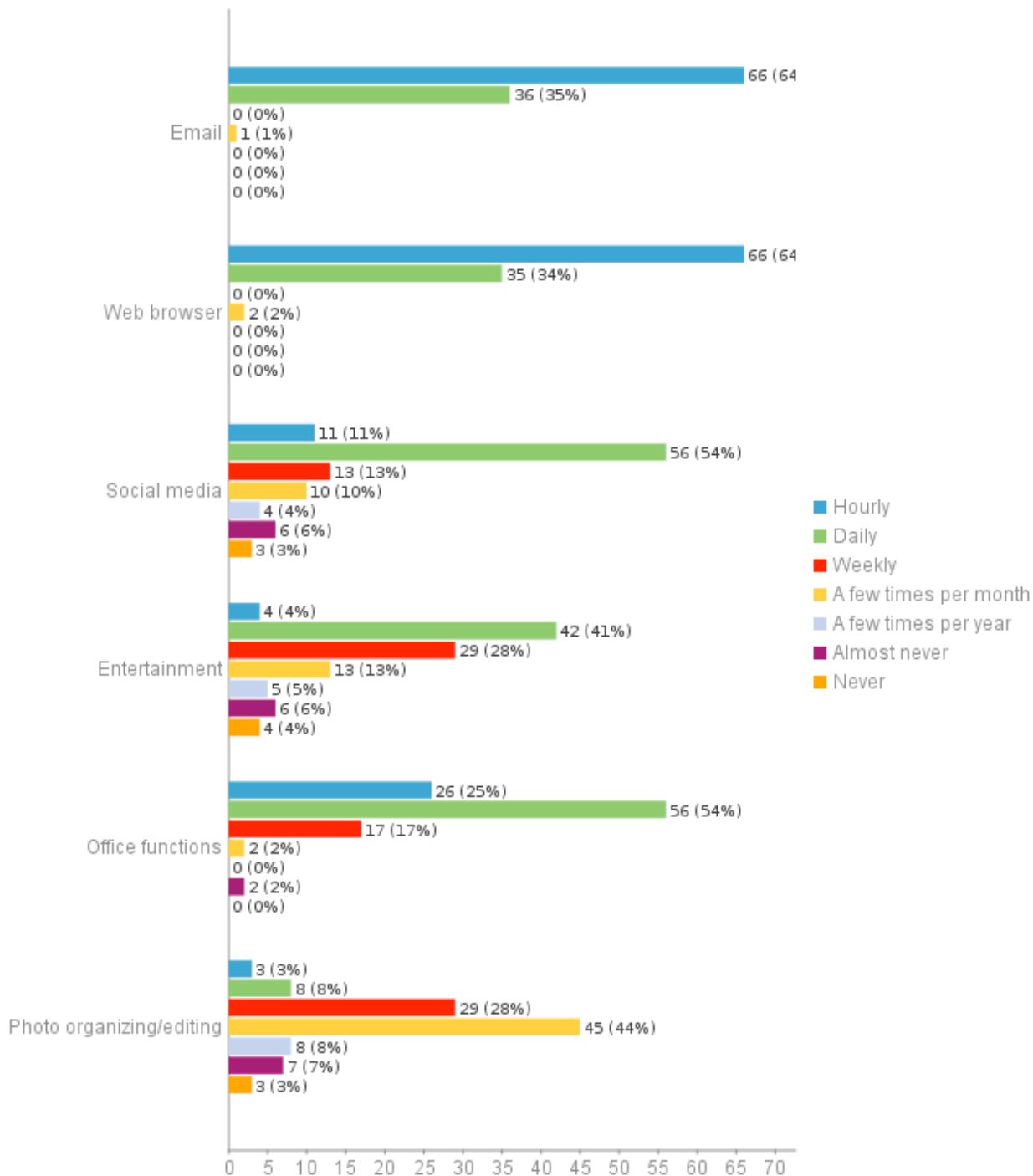
I prefer to use applications with animation when possible.



I prefer to use open source (free) software rather than proprietary software whenever feasible.



On average, how often do you use the following software or applications?





Are there any other types of software or applications that you frequently use?

| #  | Response   |
|----|--|
| 1. | Where to begin--should have listed some for us to say yes/no to. |

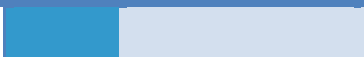

|     |  |
|-----|--|
| 2.  | SPSS   |
| 3.  | Daily planner; Privacy protection apps; Communication software (i.e. Skype)  |
| 4.  | skype  |
| 5.  | statistical programs   |
| 6.  | Statistical  |
| 7.  | statistics software  |
| 8.  | no   |
| 9.  | no   |
| 10. | iTunes, ipod   |
| 11. | Remote sensing, GIS  |
| 12. | bibliographic software   |
| 13. | powerpoint   |
| 14. | skype  |
| 15. | database, skype is only social media   |
| 16. | iTunes (when I think of "Entertainment," I think of Youtube.)                |
| 17. | Research   |
| 18. | no   |
| 19. | No   |
| 20. | Dreamweaver (daily), website content management system                       |
| 21. | Word, Excel  |
| 22. | calendar (microsoft outlook), powerpoint, youtube and video capture softward |
| 23. | Powerpoint, moodle   |
| 24. | calendaring (MS Outlook)   |
| 25. | no   |
| 26. | calendar (MS Outlook), google maps, skype                                    |
| 27. | no   |
| 28. | Music applications   |
| 29. | Google docs, Picasa, Maps, Earth   |
| 30. | Music Applications   |
| 31. | drupal cms   |
| 32. | ArcGIS   |
| 33. | ArcGIS, Illustrator, various text editors                                    |

|   |
|---|
| 34. location aware apps, online map       |
| 35. databases and GIS mapping daily       |
| 36. mapping, statistics                   |
| 37. facebook                              |
| 38. skype                                 |
| 39. Graphic design (Inkscape, Gimp)       |
| 40. Microsoft office, Corel draw, ArcGIS, |
| 41. Operating Systems!                    |
| 42. calendar                              |
| 43. ArcMap, R, Google Earth               |

Have you ever assisted in the managing of web content such as a wiki (for example wikipedia), a blog, or other methods of presenting online data?

| Response | Chart   | Percentage             | Count      |
|----------|---|------------------------|------------|
| Yes      |   | 49%                    | 49         |
| No       |  | 51%                    | 52         |
|          |   | <b>Total Responses</b> | <b>101</b> |

Are there any software programs that you have stopped using because of frustration?



| Response | Chart   | Percentage             | Count      |
|----------|---|------------------------|------------|
| Yes      |  | 33%                    | 33         |
| No       |  | 67%                    | 67         |
|          |   | <b>Total Responses</b> | <b>100</b> |

If yes, which one?



| #  | Response   |
|----|--|
| 1. | Which ones...  |
| 2. | Don't remember   |
| 3. | if i could, i'd stop using usource                     |
| 4. | Open Office  |
| 5. | Filemaker Pro, must use, but would like to stop using. |

|     |   |
|-----|---|
| 6.  | Word would be stopped - formatting is so hidden   |
| 7.  | iPhoto  |
| 8.  | prefer to not use IE, prefer chrome   |
| 9.  | Mac, everything except email  |
| 10. | CorelDraw   |
| 11. | Integrated Virtual Learning Environment, some online video programs, VBuliten (inadequate protection from spam) |
| 12. | stopped using a PDA because it couldn't coordinate with Outlook (outlook was most of the problem)               |
| 13. | microsoft word for windows, UVic's website (I have to use it, but am frustrated EVERY time.)                    |
| 14. | Occasionally Microsoft, unfortunately I have no other options so I'm stuck with that crap                       |
| 15. | Excel   |
| 16. | CRD's online regional atlas is now a real pain - much worse than previous version.                              |
| 17. | uTorrent  |
| 18. | dreamweaver   |
| 19. | Joomla  |
| 20. | WordPerfect   |
| 21. | STATA   |
| 22. | paintshop pro   |
| 23. | office  |
| 24. | i don't remember  |
| 25. | music software  |
| 26. | can't remember!   |
| 27. | Arc Scene   |
| 28. | Carmen San Diego  |
| 29. | Linux   |
| 30. | firefox or was it foxfire   |
| 31. | as many microsoft product as possible   |

Have you downloaded a web browser plug-in?

| Response               | Chart   | Percentage | Count      |
|------------------------|---|------------|------------|
| Yes                    |  | 83%        | 85         |
| No                     |  | 17%        | 18         |
| <b>Total Responses</b> |   |            | <b>103</b> |

Do you consider this to be a nuisance?

| Response               | Chart   | Percentage | Count      |
|------------------------|---|------------|------------|
| Yes                    |  | 62%        | 63         |
| No                     |  | 38%        | 38         |
| <b>Total Responses</b> |   |            | <b>101</b> |



If yes, why?

| #   | Response   |
|-----|--|
| 1.  | Sometimes.   |
| 2.  | its just another step you have to go through and sometimes it doesn't even work  |
| 3.  | I just hate it.I have to download diff programs to diff things and I do not like it.   |
| 4.  | time consuming, somewhat scary (virus possibilities)   |
| 5.  | by asking if i want to download a plug in it makes me question the security of the application. "is this spyware? will it hijack cpu time?" Also sometimes there are compatibility issues which are difficult to resolve |
| 6.  | I don't think anybody particularly enjoys going to use a tool then having to stop and download something first   |
| 7.  | It adds unnecessary crap to your view (clutter)  |
| 8.  | can't watch things   |
| 9.  | It often takes a long time and then wants to restart Firefox/IE, which is annoying if you have multiple tabs/windows open.   |
| 10. | time, something extra to do, don't want to put something extra on my computer  |
| 11. | cause not interested in extra technology   |
| 12. | slow process   |
| 13. | time and the possibility of needing to restart my browser  |







|     |  |
|-----|--|
| 14. | security concerns  |
| 15. | interrupts activity. adds a barrier to accomplishing a goal  |
| 16. | a nuisance if disrupts workflow or if it closes the browser/shut off computer  |
| 17. | Sometimes I don't know whether I should trust the plug-ins or not.   |
| 18. | because I don't understand what plugin means, and feel I can survive without it. Plus, I don't like to fill up my computer with stuff I don't need   |
| 19. | it takes time  |
| 20. | should be seamless and standards-based - with no need for plug in  |
| 21. | It's an additional barrier between me and what I want to access, and sometimes isn't useful in the end.  |
| 22. | Sometimes plugins require a tech support person to install it.   |
| 23. | Does "this" mean "the survey" or "web browser plug-in"? What is a plug-in?   |
| 24. | because a technician needs to be called to install it  |
| 25. | can lead to problems, viruses etc  |
| 26. | didn't have admin capabilities to download plug in   |
| 27. | time issues  |
| 28. | depends on whether it is because of a choice or being forced   |
| 29. | sometimes it wont work or needs to be updated regularly  |
| 30. | why should i have to do that? the browser i'm using should already have it, or something. since switching to chrome, that hasn't really been a problem   |
| 31. | If it is a plug in for a site which I do not intend to use regularly, I am aware that I am installing a program on my machine which I will likely use infrequently. I wonder whether it will adversely effect the performance of my machine. |
| 32. | uncertainty in browser safety  |
| 33. | I don't want to have to download any plug-in to my computer, it is a hassle and a pain in the butt when it decides to crap out in the middle of doing something that requires the plug-in  |
| 34. | Software often made for PCs. It often takes extra time to search for the specific plug-in made for a MAC.  |
| 35. | Because it's another download which takes time and memory and it seems sites use different plugins   |
| 36. | Time   |
| 37. | They often do not work.  |
| 38. | If my computer connection is slow downloading can take too much time   |
| 39. | I use several Chrome add-ons - most work well and are very useful.   |
| 40. | It is a second step  |

|     |   |
|-----|---|
| 41. | There are many methods of displaying most data online without them - ie. using javascript, html5 etc...   |
| 42. | The number of different browser plugins can become cumbersome and compatibility issues with mobile phones |
| 43. | time, effort  |
| 44. | time consuming, and I'm technologically challenged, so I'm never sure about clicking things               |
| 45. | i don't trust where it's coming from so tend to avoid it.   |
| 46. | takes too much time   |
| 47. | university network security stops me  |
| 48. | takes time  |
| 49. | sometimes they don't work   |
| 50. | Poss. issues with public computers and reinstallation   |
| 51. | There are too many different plug-ins for applications. Few plug-ins would be easier to manage            |
| 52. | It often requires you to restart the task you wanted to do such as downloading a file .                   |
| 53. | Some has no compatible version for a browser, or browser can't recognize it.                              |
| 54. | Time required and often the downloads are "buggy" (get blocked, or don't work in all browsers)            |
| 55. | i don't know if it is always secure   |
| 56. | work computer doesn't always allow me to download   |
| 57. | security issues   |




Have you ever abandoned an activity because it required a plug-in to be downloaded?

| Response | Chart   | Percentage             | Count      |
|----------|---|------------------------|------------|
| Yes      |  | 81%                    | 82         |
| No       |  | 19%                    | 19         |
|          |   | <b>Total Responses</b> | <b>101</b> |




What size and style is your computer monitor?

| Response                | Chart   | Percentage             | Count      |
|-------------------------|---|------------------------|------------|
| Small laptop            |  | 19%                    | 20         |
| Regular laptop          |  | 49%                    | 50         |
| Large laptop            |  | 21%                    | 22         |
| Small/old monitor       |  | 1%                     | 1          |
| New-ish flat monitor    |  | 35%                    | 36         |
| Very large flat monitor |  | 21%                    | 22         |
| Not sure                |  | 0%                     | 0          |
|                         |   | <b>Total Responses</b> | <b>103</b> |


What type of monitor do you have?

| Response   | Chart   | Percentage             | Count      |
|------------|---|------------------------|------------|
| Normal     |    | 40%                    | 40         |
| Widescreen |   | 66%                    | 67         |
| Not sure   |  | 3%                     | 3          |
|            |   | <b>Total Responses</b> | <b>101</b> |


Do you use dual monitors?

| Response | Chart   | Percentage             | Count      |
|----------|---|------------------------|------------|
| Single   |  | 84%                    | 86         |
| Dual     |  | 23%                    | 23         |
| Not sure |  | 3%                     | 3          |
|          |   | <b>Total Responses</b> | <b>102</b> |

Do you use a Mac or a PC?

| Response | Chart   | Percentage             | Count      |
|----------|---|------------------------|------------|
| Mac      |  | 43%                    | 44         |
| PC       |   | 68%                    | 69         |
|          |   | <b>Total Responses</b> | <b>102</b> |

Would you consider using a small handheld device (for example a cellphone) to explore an online mapping application?

| Response      | Chart   | Percentage             | Count      |
|---------------|---|------------------------|------------|
| Yes           |  | 68%                    | 70         |
| No - why not? |   | 32%                    | 33         |
|               |   | <b>Total Responses</b> | <b>103</b> |

Would you consider using a small handheld device (for example a cellphone) to explore an online mapping application? (No - why not?)

| #   | Response  |
|-----|---|
| 1.  | Don't own one   |
| 2.  | too small, but I would use it if it was a necessity   |
| 3.  | Because I am poor   |
| 4.  | no internet service on phone  |
| 5.  | My cell doesn't do that, too old.   |
| 6.  | Have a GPS or advance research would be done  |
| 7.  | needs glasses for something that small. not a big cell phone user   |
| 8.  | Don't have a capable model  |
| 9.  | Because I don't own a cell phone  |
| 10. | They are very expensive   |
| 11. | The small display does not lend itself well to scanning a map - something that usually covers a large area. Plus, if it is a detailed map reading that detail is difficult on a small screen. |
| 12. | Too complicated   |

|     |   |
|-----|---|
| 13. | prefer computer   |
| 14. | dont have one   |
| 15. | I have an ipod touch that i use. my cell phone's screen is bigger than the one in the example and i still wouldn't use it because it's too small. If you want people to accurately answer this question, at least pick a cell phone that is up to date, like an iphone or android or something. that thing's got to be at least 6 years old. who do you think still owns something like that? and if they did, who do you think would actually use it for mapping capabilities? |
| 16. | don't have one  |
| 17. | I do not own such a device.   |
| 18. | Because my cell doesn't have those capabilities. If it did, I would use it.   |
| 19. | too small   |
| 20. | data too expensive in cell phone plans, also too small of a screen  |
| 21. | Don't have cell phone -- and hope not to get one.   |
| 22. | with maps if find cellphone screens too small (iphone might be ok)  |
| 23. | no experience with it to make an informed choice  |
| 24. | Don't have one  |
| 25. | I don't have a smart phone and don't plan to get one any time soon.   |
| 26. | costs too much  |
| 27. | Plan don't support internet/too costly; Equipment does not have such advanced capability.   |
| 28. | Don't own one   |
| 29. | I have none   |
| 30. | I don't have a cellphone  |

In which group do you consider yourself to be?

| Response               | Chart | Percentage             | Count      |
|------------------------|-------|------------------------|------------|
| Administration         |       | 6%                     | 6          |
| Staff                  |       | 8%                     | 8          |
| Faculty                |       | 12%                    | 12         |
| Graduate Students      |       | 36%                    | 37         |
| Undergraduate Students |       | 25%                    | 26         |
| Alumni                 |       | 7%                     | 7          |
| Public                 |       | 6%                     | 6          |
|                        |       | <b>Total Responses</b> | <b>102</b> |

Are there any additional comments that you would like to make?

| #   | Response  |
|-----|---|
| 1.  | Cannot wait to see findings. Good luck!   |
| 2.  | Good luck with the project!   |
| 3.  | Good luck in your research Ian!   |
| 4.  | For this question: I prefer to use maps that include as many details as possible. Maps are nice if they CAN include a lot of detail (by manipulating how little or much detail is on the map) but if it just has a lot of detail to begin with it might be a little too cluttered and slow for people who use map apps on older phones (or are in an area with a slow internet connection). |
| 5.  | Great survey!   |
| 6.  | Maps have to be up to date - current country names. Likes interactivity. Historical data is very useful - seeing past connections can help reopen new ones.   |
| 7.  | very important to keep the information up to date robust links to research related material layered information, quick blurb down to very detailed information links. build depth into the information.   |
| 8.  | Web maps are best when they are simple and elegant and not crammed with features and/or data  |
| 9.  | This seems like a neat project. I hope it gets through development speedily so that a final product can be used and enjoyed as soon as possible.  |
| 10. | Uvic has a need for a single database, either a map or just a database, that is searchable that would encompass all the university. Has a critical need for updating.   |
| 11. | Mobile device support is very important - these are the future, so need to be supported from the beginning.   |
| 12. | I'm retired (80 years old) and have difficulty learning how to use new technologies.  |
| 13. | Zooming out should reduce the level of detail on a map, while zooming in will add detail.   |
| 14. | Information such as contact information should be provided but be a choice. If groups choose to put the time into keeping these updated, they should have the chance to customize the connection page.  |
| 15. | ability to have a "content expert" - someone who would be a contact for a particular region. ability to add funding sources by country/region in order to identify potential sources for future research. ability to get travel requirements for countries - visa requirements, vaccinations etc  |
| 16. | Concerned that any product needs to have a low bandwidth option to cater to the other parts of the world. Short downloads are also key for some areas that have limited power supplies. Data table/drop down should be available for low bandwidths. Globe or 3D would be great for areas of the world that can handle it.  |
| 17. | I like this idea. Good work! I saw some example pictures earlier in the survey that looked like GIS mapping software. I hope that your final product is more streamlined and simple   |

than that interface; something closer to google maps, perhaps. I just finished applying for International Exchange last week, and I know that if there was a world map that featured all the different available schools on it, I would have had a much easier time figuring out where I wanted to go. You know what you could do - for that map, you could let people apply filters to the schools, based on whether they teach in English or not, and whether they are "only open to Humanities students" or "only open to Economics students". I know for me, it was a let down to find out about that after I had already done some research on those schools.

18. Good luck!

19. good luck.

20. I hope this will help in your research. I must admit I might be a bit biased, until a few weeks ago I hadn't been a student in a few years. I maybe used a computer every few months, I strongly believe in other forms of information and communication. Hearing a voice, or holding a map add more value to the information even if it isn't always as accurate or as detailed as it could be.

21. Send me results: [jnewcomb@uvic.ca](mailto:jnewcomb@uvic.ca)

22. Cool concept - It would be nice to see links to student organizations like AESIC as well.

23. Makes for a very interesting topic of research.

24. I think this is a great idea and look forward to the results. Keep up the good work Ian!

25. Pay attention to Tufte.

26. sounds like fun!

27. I am a parent of a current Uvic student and a teacher at a local high school.

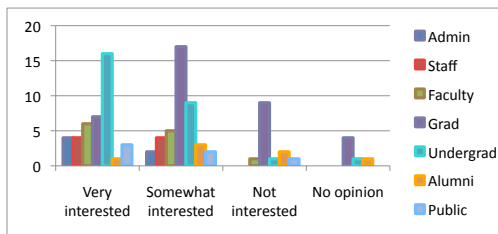
28. Good luck on your research.

## Appendix L: Survey Results Organized by Response Group

How interested are you in each of these types of connections?

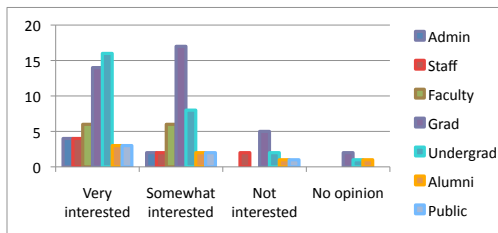
### Co-op locations

|           | Very interested | Somewhat interested | Not interested | No opinion | Total |
|-----------|-----------------|---------------------|----------------|------------|-------|
| Admin     | 4               | 2                   | 0              | 0          | 6     |
| Staff     | 4               | 4                   | 0              | 0          | 8     |
| Faculty   | 6               | 5                   | 1              | 0          | 12    |
| Grad      | 7               | 17                  | 9              | 4          | 37    |
| Undergrad | 16              | 9                   | 1              | 1          | 27    |
| Alumni    | 1               | 3                   | 2              | 1          | 7     |
| Public    | 3               | 2                   | 1              | 0          | 6     |
| Totals    | 41              | 42                  | 14             | 6          | 103   |



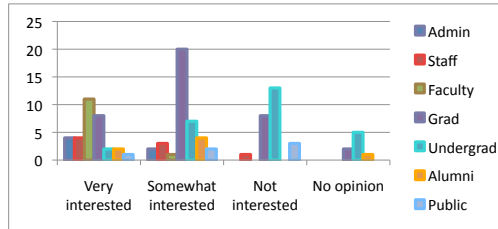
### Student Exchange Locations

|           | Very interested | Somewhat interested | Not interested | No opinion | Total |
|-----------|-----------------|---------------------|----------------|------------|-------|
| Admin     | 4               | 2                   | 0              | 0          | 6     |
| Staff     | 4               | 2                   | 2              | 0          | 8     |
| Faculty   | 6               | 6                   | 0              | 0          | 12    |
| Grad      | 14              | 17                  | 5              | 2          | 38    |
| Undergrad | 16              | 8                   | 2              | 1          | 27    |
| Alumni    | 3               | 2                   | 1              | 1          | 7     |
| Public    | 3               | 2                   | 1              | 0          | 6     |
| Totals    | 50              | 39                  | 11             | 4          | 104   |



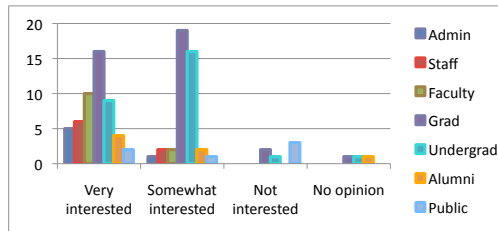
### Faculty Exchange Locations

|           | Very interested | Somewhat interested | Not interested | No opinion | Total |
|-----------|-----------------|---------------------|----------------|------------|-------|
| Admin     | 4               | 2                   | 0              | 0          | 6     |
| Staff     | 4               | 3                   | 1              | 0          | 8     |
| Faculty   | 11              | 1                   | 0              | 0          | 12    |
| Grad      | 8               | 20                  | 8              | 2          | 38    |
| Undergrad | 2               | 7                   | 13             | 5          | 27    |
| Alumni    | 2               | 4                   | 0              | 1          | 7     |
| Public    | 1               | 2                   | 3              | 0          | 6     |
| Totals    | 32              | 39                  | 25             | 8          | 104   |



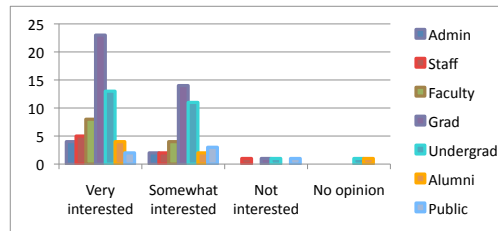
### Partner Universities

|           | Very interested | Somewhat interested | Not interested | No opinion | Total |
|-----------|-----------------|---------------------|----------------|------------|-------|
| Admin     | 5               | 1                   | 0              | 0          | 6     |
| Staff     | 6               | 2                   | 0              | 0          | 8     |
| Faculty   | 10              | 2                   | 0              | 0          | 12    |
| Grad      | 16              | 19                  | 2              | 1          | 38    |
| Undergrad | 9               | 16                  | 1              | 1          | 27    |
| Alumni    | 4               | 2                   | 0              | 1          | 7     |
| Public    | 2               | 1                   | 3              | 0          | 6     |
| Totals    | 52              | 43                  | 6              | 3          | 104   |



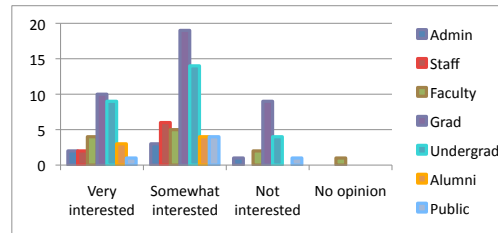
### Research Locations

|           | Very interested | Somewhat interested | Not interested | No opinion | Total |
|-----------|-----------------|---------------------|----------------|------------|-------|
| Admin     | 4               | 2                   | 0              | 0          | 6     |
| Staff     | 5               | 2                   | 1              | 0          | 8     |
| Faculty   | 8               | 4                   | 0              | 0          | 12    |
| Grad      | 23              | 14                  | 1              | 0          | 38    |
| Undergrad | 13              | 11                  | 1              | 1          | 26    |
| Alumni    | 4               | 2                   | 0              | 1          | 7     |
| Public    | 2               | 3                   | 1              | 0          | 6     |
| Totals    | 59              | 38                  | 4              | 2          | 103   |



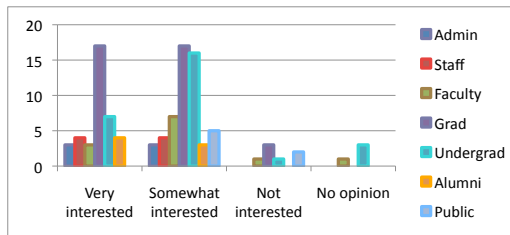
### UVic courses with an international subject

|           | Very interested | Somewhat interested | Not interested | No opinion | Total |
|-----------|-----------------|---------------------|----------------|------------|-------|
| Admin     | 2               | 3                   | 1              | 0          | 6     |
| Staff     | 2               | 6                   | 0              | 0          | 8     |
| Faculty   | 4               | 5                   | 2              | 1          | 12    |
| Grad      | 10              | 19                  | 9              | 0          | 38    |
| Undergrad | 9               | 14                  | 4              | 0          | 27    |
| Alumni    | 3               | 4                   | 0              | 0          | 7     |
| Public    | 1               | 4                   | 1              | 0          | 6     |
| Totals    | 31              | 55                  | 17             | 1          | 104   |



**UVic research centres' international projects**

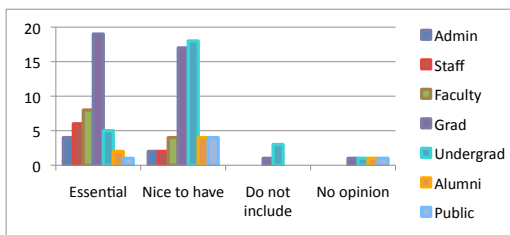
|           | Very interested | Somewhat interested | Not interested | No opinion | Total |
|-----------|-----------------|---------------------|----------------|------------|-------|
| Admin     | 3               | 3                   | 0              | 0          | 6     |
| Staff     | 4               | 4                   | 0              | 0          | 8     |
| Faculty   | 3               | 7                   | 1              | 1          | 12    |
| Grad      | 17              | 17                  | 3              | 0          | 37    |
| Undergrad | 7               | 16                  | 1              | 3          | 27    |
| Alumni    | 4               | 3                   | 0              | 0          | 7     |
| Public    | 0               | 5                   | 2              | 0          | 7     |
| Totals    | 38              | 55                  | 7              | 4          | 104   |



Use the scale "Essential", "Nice to have", "Do not include", and "No opinion", to rank how important the inclusion of each of the following is to the connection being mapped.

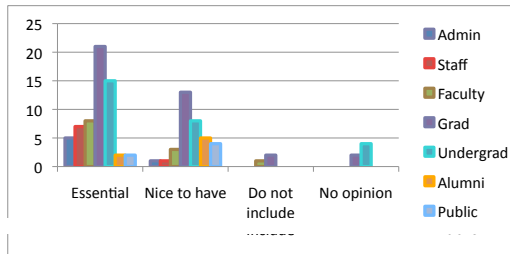
**Names of people involved**

|           | Essential | Nice to have | Do not include | No opinion | Total |
|-----------|-----------|--------------|----------------|------------|-------|
| Admin     | 4         | 2            | 0              | 0          | 6     |
| Staff     | 6         | 2            | 0              | 0          | 8     |
| Faculty   | 8         | 4            | 0              | 0          | 12    |
| Grad      | 19        | 17           | 1              | 1          | 38    |
| Undergrad | 5         | 18           | 3              | 1          | 27    |
| Alumni    | 2         | 4            | 0              | 1          | 7     |
| Public    | 1         | 4            | 0              | 1          | 6     |
| Totals    | 45        | 51           | 4              | 4          | 104   |



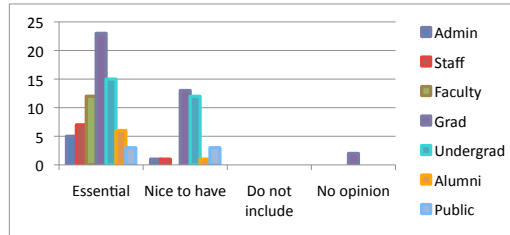
**Contact information**

|           | Essential | Nice to have | Do not include | No opinion | Total |
|-----------|-----------|--------------|----------------|------------|-------|
| Admin     | 5         | 1            | 0              | 0          | 6     |
| Staff     | 7         | 1            | 0              | 0          | 8     |
| Faculty   | 8         | 3            | 1              | 0          | 12    |
| Grad      | 21        | 13           | 2              | 2          | 38    |
| Undergrad | 15        | 8            | 0              | 4          | 27    |
| Alumni    | 2         | 5            | 0              | 0          | 7     |
| Public    | 2         | 4            | 0              | 0          | 6     |
| Totals    | 60        | 35           | 3              | 6          | 104   |



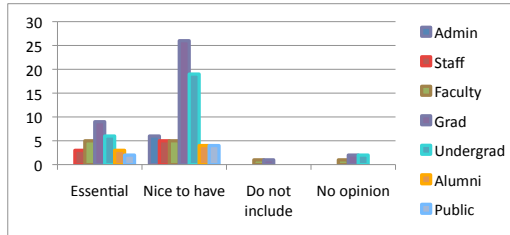
**Short descriptions**

|           | Essential | Nice to have | Do not include | No opinion | Total |
|-----------|-----------|--------------|----------------|------------|-------|
| Admin     | 5         | 1            | 0              | 0          | 6     |
| Staff     | 7         | 1            | 0              | 0          | 8     |
| Faculty   | 12        | 0            | 0              | 0          | 12    |
| Grad      | 23        | 13           | 0              | 2          | 38    |
| Undergrad | 15        | 12           | 0              | 0          | 27    |
| Alumni    | 6         | 1            | 0              | 0          | 7     |
| Public    | 3         | 3            | 0              | 0          | 6     |
| Totals    | 50        | 39           | 11             | 4          | 104   |



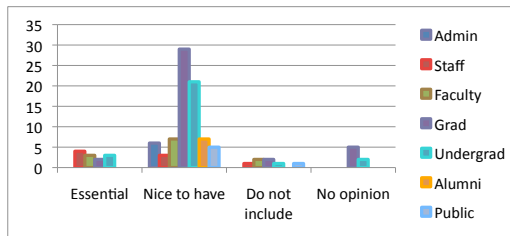
**Links to related information**

|           | Essential | Nice to have | Do not include | No opinion | Total |
|-----------|-----------|--------------|----------------|------------|-------|
| Admin     | 0         | 6            | 0              | 0          | 6     |
| Staff     | 3         | 5            | 0              | 0          | 8     |
| Faculty   | 5         | 5            | 1              | 1          | 12    |
| Grad      | 9         | 26           | 1              | 2          | 38    |
| Undergrad | 6         | 19           | 0              | 2          | 27    |
| Alumni    | 3         | 4            | 0              | 0          | 7     |
| Public    | 2         | 4            | 0              | 0          | 6     |
| Totals    | 50        | 39           | 11             | 4          | 104   |



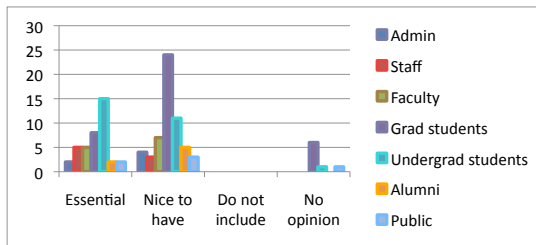
**Information about the number of UVic students involved**

|           | Essential | Nice to have | Do not include | No opinion | Total |
|-----------|-----------|--------------|----------------|------------|-------|
| Admin     | 0         | 6            | 0              | 0          | 6     |
| Staff     | 4         | 3            | 1              | 0          | 8     |
| Faculty   | 3         | 7            | 2              | 0          | 12    |
| Grad      | 2         | 29           | 2              | 5          | 38    |
| Undergrad | 3         | 21           | 1              | 2          | 27    |
| Alumni    | 0         | 7            | 0              | 0          | 7     |
| Public    | 0         | 5            | 1              | 0          | 6     |
| Totals    | 50        | 39           | 11             | 4          | 104   |



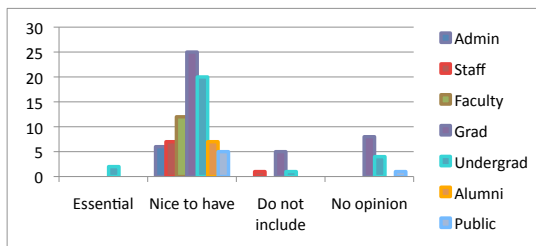
**Photographs**

|                 | Essential | Nice to have | Do not include | No opinion | Total |
|-----------------|-----------|--------------|----------------|------------|-------|
| Admin           | 2         | 4            | 0              | 0          | 6     |
| Staff           | 5         | 3            | 0              | 0          | 8     |
| Faculty         | 5         | 7            | 0              | 0          | 12    |
| Grad students   | 8         | 24           | 0              | 6          | 38    |
| Undergrad stude | 15        | 11           | 0              | 1          | 27    |
| Alumni          | 2         | 5            | 0              | 0          | 7     |
| Public          | 2         | 3            | 0              | 1          | 6     |
| Totals          | 50        | 39           | 11             | 4          | 104   |



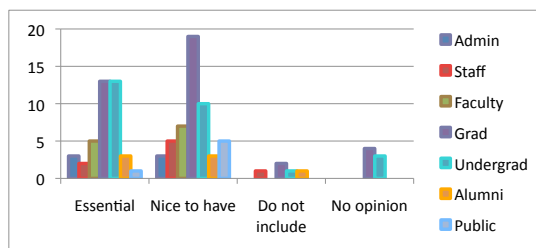
**Videos**

|           | Essential | Nice to have | Do not include | No opinion | Total |
|-----------|-----------|--------------|----------------|------------|-------|
| Admin     | 0         | 6            | 0              | 0          | 6     |
| Staff     | 0         | 7            | 1              | 0          | 8     |
| Faculty   | 0         | 12           | 0              | 0          | 12    |
| Grad      | 0         | 25           | 5              | 8          | 38    |
| Undergrad | 2         | 20           | 1              | 4          | 27    |
| Alumni    | 0         | 7            | 0              | 0          | 7     |
| Public    | 0         | 5            | 0              | 1          | 6     |
| Totals    | 50        | 39           | 11             | 4          | 104   |



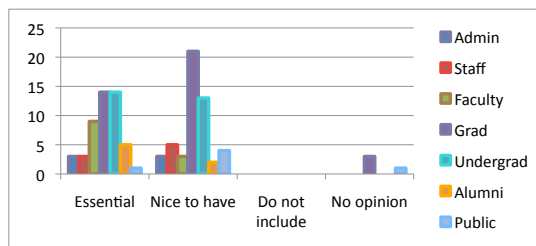
**Ability to print screen**

|           | Essential | Nice to have | Do not include | No opinion | Total |
|-----------|-----------|--------------|----------------|------------|-------|
| Admin     | 3         | 3            | 0              | 0          | 6     |
| Staff     | 2         | 5            | 1              | 0          | 8     |
| Faculty   | 5         | 7            | 0              | 0          | 12    |
| Grad      | 13        | 19           | 2              | 4          | 38    |
| Undergrad | 13        | 10           | 1              | 3          | 27    |
| Alumni    | 3         | 3            | 1              | 0          | 7     |
| Public    | 1         | 5            | 0              | 0          | 6     |
| Totals    | 50        | 39           | 11             | 4          | 104   |



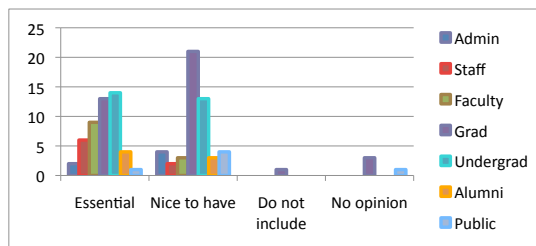
**Ability to display a single UVic department**

|           | Essential | Nice to have | Do not include | No opinion | Total |
|-----------|-----------|--------------|----------------|------------|-------|
| Admin     | 3         | 3            | 0              | 0          | 6     |
| Staff     | 3         | 5            | 0              | 0          | 8     |
| Faculty   | 9         | 3            | 0              | 0          | 12    |
| Grad      | 14        | 21           | 0              | 3          | 38    |
| Undergrad | 14        | 13           | 0              | 0          | 27    |
| Alumni    | 5         | 2            | 0              | 0          | 7     |
| Public    | 1         | 4            | 0              | 1          | 6     |
| Totals    | 50        | 39           | 11             | 4          | 104   |



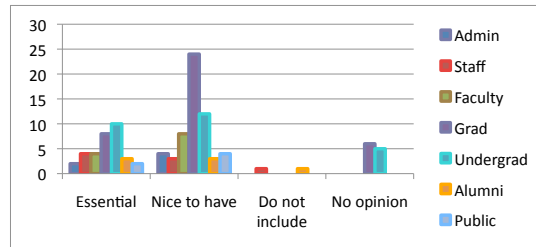
**Ability to display a single country**

|           | Essential | Nice to have | Do not include | No opinion | Total |
|-----------|-----------|--------------|----------------|------------|-------|
| Admin     | 2         | 4            | 0              | 0          | 6     |
| Staff     | 6         | 2            | 0              | 0          | 8     |
| Faculty   | 9         | 3            | 0              | 0          | 12    |
| Grad      | 13        | 21           | 1              | 3          | 38    |
| Undergrad | 14        | 13           | 0              | 0          | 27    |
| Alumni    | 4         | 3            | 0              | 0          | 7     |
| Public    | 1         | 4            | 0              | 1          | 6     |
| Totals    | 50        | 39           | 11             | 4          | 104   |



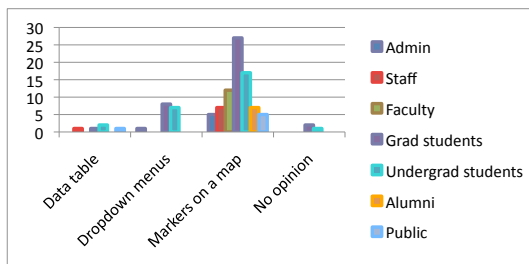
**Ability to display data in conventional database**

|           | Essential | Nice to have | Do not include | No opinion | Total |
|-----------|-----------|--------------|----------------|------------|-------|
| Admin     | 2         | 4            | 0              | 0          | 6     |
| Staff     | 4         | 3            | 1              | 0          | 8     |
| Faculty   | 4         | 8            | 0              | 0          | 12    |
| Grad      | 8         | 24           | 0              | 6          | 38    |
| Undergrad | 10        | 12           | 0              | 5          | 27    |
| Alumni    | 3         | 3            | 1              | 0          | 7     |
| Public    | 2         | 4            | 0              | 0          | 6     |
| Totals    | 50        | 39           | 11             | 4          | 104   |



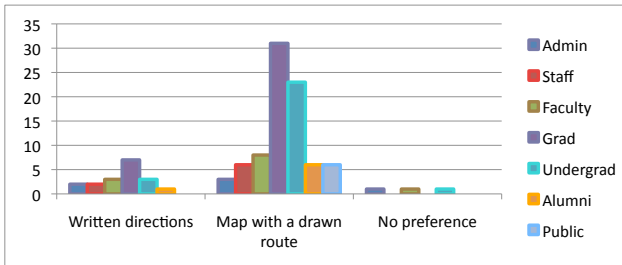
**If you were interested in finding all of UVic's Geography department research sites in Thailand, what would be your preferred method for retrieving this information?**

|                    | Data table | Dropdown menus | Markers on a map | No opinion | Total |
|--------------------|------------|----------------|------------------|------------|-------|
| Admin              | 0          | 1              | 5                | 0          | 6     |
| Staff              | 1          | 0              | 7                | 0          | 8     |
| Faculty            | 0          | 0              | 12               | 0          | 12    |
| Grad students      | 1          | 8              | 27               | 2          | 38    |
| Undergrad students | 2          | 7              | 17               | 1          | 27    |
| Alumni             | 0          | 0              | 7                | 0          | 7     |
| Public             | 1          | 0              | 5                | 0          | 6     |
| Totals             | 50         | 39             | 11               | 4          | 104   |



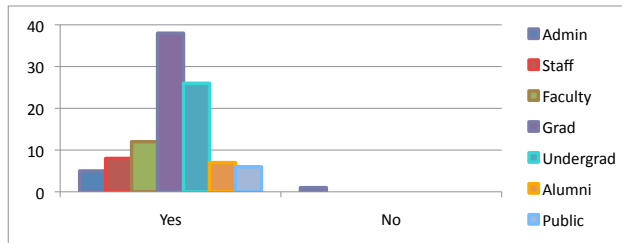
**If you were driving to an unfamiliar location, which would you prefer to use?**

|           | Written directions | Map with a drawn route | No preference | Total |
|-----------|--------------------|------------------------|---------------|-------|
| Admin     | 2                  | 3                      | 1             | 6     |
| Staff     | 2                  | 6                      | 0             | 8     |
| Faculty   | 3                  | 8                      | 1             | 12    |
| Grad      | 7                  | 31                     | 0             | 38    |
| Undergrad | 3                  | 23                     | 1             | 27    |
| Alumni    | 1                  | 6                      | 0             | 7     |
| Public    | 0                  | 6                      | 0             | 6     |
| Totals    | 18                 | 83                     | 3             | 104   |



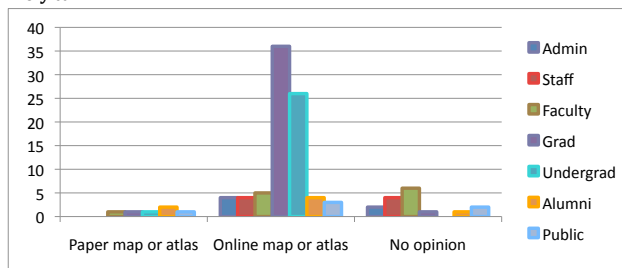
**Do you regularly use a map as a source of information?**

|           | Yes | No | Total |
|-----------|-----|----|-------|
| Admin     | 5   | 1  | 6     |
| Staff     | 8   | 0  | 8     |
| Faculty   | 12  | 0  | 12    |
| Grad      | 38  | 0  | 38    |
| Undergrad | 26  | 0  | 26    |
| Alumni    | 7   | 0  | 7     |
| Public    | 6   | 0  | 6     |
| Totals    | 102 | 1  | 103   |



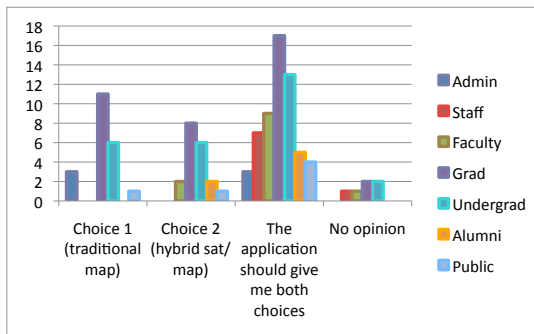
**If you need to use a map, to which source would you more likely turn?**

|           | Paper map or atlas | Online map or atlas | No opinion | Total |
|-----------|--------------------|---------------------|------------|-------|
| Admin     | 0                  | 4                   | 2          | 6     |
| Staff     | 0                  | 4                   | 4          | 8     |
| Faculty   | 1                  | 5                   | 6          | 12    |
| Grad      | 1                  | 36                  | 1          | 38    |
| Undergrad | 1                  | 26                  | 0          | 27    |
| Alumni    | 2                  | 4                   | 1          | 7     |
| Public    | 1                  | 3                   | 2          | 6     |
| Totals    | 6                  | 82                  | 16         | 104   |



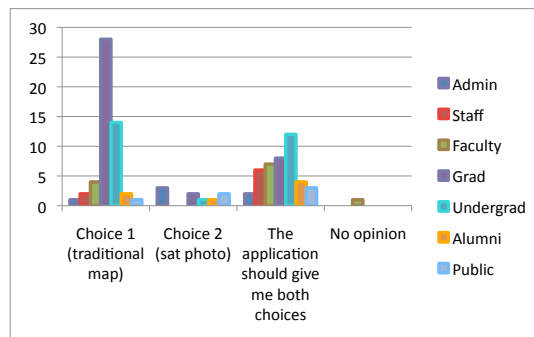
**If you were to use a world map, which type do you prefer?**

|           | Choice 1<br>(traditional<br>map) | Choice 2<br>(hybrid<br>sat/map) | The<br>application<br>should give<br>me both<br>choices | No opinion | Total |
|-----------|----------------------------------|---------------------------------|---|------------|-------|
| Admin     | 3                                | 0                               | 3   | 0          | 6     |
| Staff     | 0                                | 0                               | 7   | 1          | 8     |
| Faculty   | 0                                | 2                               | 9   | 1          | 12    |
| Grad      | 11                               | 8                               | 17  | 2          | 38    |
| Undergrad | 6                                | 6                               | 13  | 2          | 27    |
| Alumni    | 0                                | 2                               | 5   | 0          | 7     |
| Public    | 1                                | 1                               | 4   | 0          | 6     |
| Totals    | 21                               | 19                              | 58  | 6          | 104   |



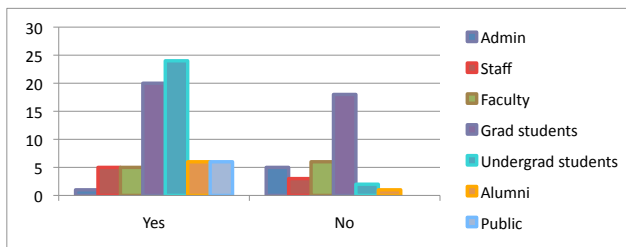
**If you were to use a detailed map, such as one of the UVic campus, which do you prefer?**

|           | Choice 1<br>(traditional<br>map) | Choice 2<br>(sat photo<br>map) | The<br>application<br>should give<br>me both<br>choices | No opinion | Total |
|-----------|----------------------------------|--------------------------------|---|------------|-------|
| Admin     | 1                                | 3                              | 2   | 0          | 6     |
| Staff     | 2                                | 0                              | 6   | 0          | 8     |
| Faculty   | 4                                | 0                              | 7   | 1          | 12    |
| Grad      | 28                               | 2                              | 8   | 0          | 38    |
| Undergrad | 14                               | 1                              | 12  | 0          | 27    |
| Alumni    | 2                                | 1                              | 4   | 0          | 7     |
| Public    | 1                                | 2                              | 3   | 0          | 6     |
| Totals    | 52                               | 9                              | 42  | 1          | 104   |



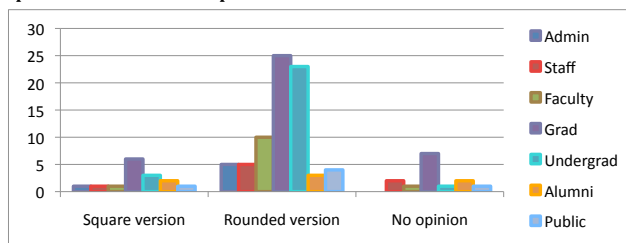
**Do you understand what is meant by a map projection?**

|                    | Yes | No | Total |
|--------------------|-----|----|-------|
| Admin              | 1   | 5  | 6     |
| Staff              | 5   | 3  | 8     |
| Faculty            | 5   | 6  | 11    |
| Grad students      | 20  | 18 | 38    |
| Undergrad students | 24  | 2  | 26    |
| Alumni             | 6   | 1  | 7     |
| Public             | 6   | 0  | 6     |
| Totals             | 67  | 35 | 102   |



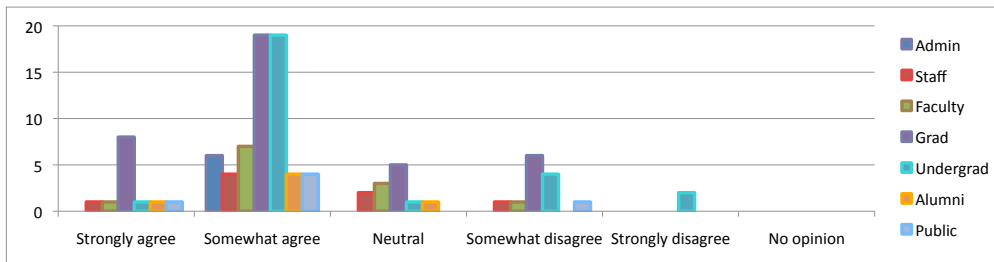
**Which of the following images of the world would you most prefer for the world map?**

|           | Square<br>version | Rounded<br>version | No opinion | Total |
|-----------|-------------------|--------------------|------------|-------|
| Admin     | 1                 | 5                  | 0          | 6     |
| Staff     | 1                 | 5                  | 2          | 8     |
| Faculty   | 1                 | 10                 | 1          | 12    |
| Grad      | 6                 | 25                 | 7          | 38    |
| Undergrad | 3                 | 23                 | 1          | 27    |
| Alumni    | 2                 | 3                  | 2          | 7     |
| Public    | 1                 | 4                  | 1          | 6     |
| Totals    | 15                | 75                 | 14         | 104   |



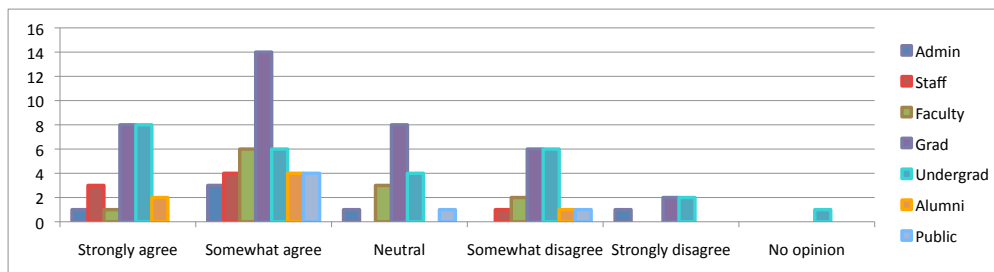
**I prefer to use maps that include as many details as possible.**

|           | Strongly agree | Somewhat agree | Neutral | Somewhat disagree | Strongly disagree | No opinion | Total |
|-----------|----------------|----------------|---------|-------------------|-------------------|------------|-------|
| Admin     | 0              | 6              | 0       | 0                 | 0                 | 0          | 6     |
| Staff     | 1              | 4              | 2       | 1                 | 0                 | 0          | 8     |
| Faculty   | 1              | 7              | 3       | 1                 | 0                 | 0          | 12    |
| Grad      | 8              | 19             | 5       | 6                 | 0                 | 0          | 38    |
| Undergrad | 1              | 19             | 1       | 4                 | 2                 | 0          | 27    |
| Alumni    | 1              | 4              | 1       | 0                 | 0                 | 0          | 6     |
| Public    | 1              | 4              | 0       | 1                 | 0                 | 0          | 6     |
| Totals    | 13             | 63             | 12      | 13                | 2                 | 0          | 103   |



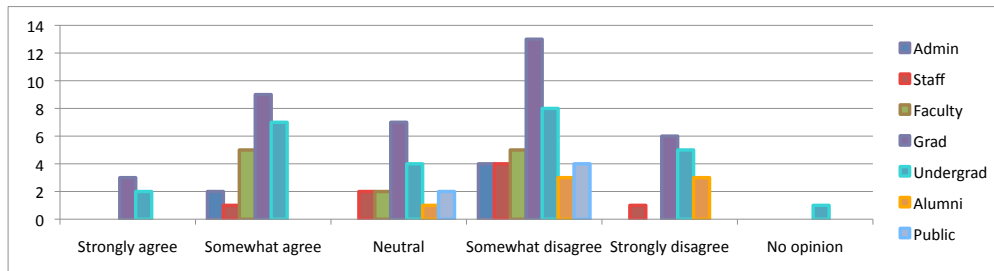
**I prefer to start with a basic empty map and add detail as needed.**

|           | Strongly agree | Somewhat agree | Neutral | Somewhat disagree | Strongly disagree | No opinion | Total |
|-----------|----------------|----------------|---------|-------------------|-------------------|------------|-------|
| Admin     | 1              | 3              | 1       | 0                 | 1                 | 0          | 6     |
| Staff     | 3              | 4              | 0       | 1                 | 0                 | 0          | 8     |
| Faculty   | 1              | 6              | 3       | 2                 | 0                 | 0          | 12    |
| Grad      | 8              | 14             | 8       | 6                 | 2                 | 0          | 38    |
| Undergrad | 8              | 6              | 4       | 6                 | 2                 | 1          | 27    |
| Alumni    | 2              | 4              | 0       | 1                 | 0                 | 0          | 7     |
| Public    | 0              | 4              | 1       | 1                 | 0                 | 0          | 6     |
| Totals    | 23             | 41             | 17      | 17                | 5                 | 1          | 104   |



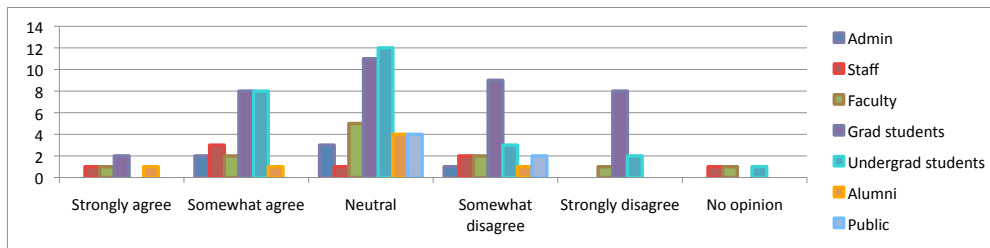
**I prefer to start with a very detailed map and remove detail as needed.**

|           | Strongly agree | Somewhat agree | Neutral | Somewhat disagree | Strongly disagree | No opinion | Total |
|-----------|----------------|----------------|---------|-------------------|-------------------|------------|-------|
| Admin     | 0              | 2              | 0       | 4                 | 0                 | 0          | 6     |
| Staff     | 0              | 1              | 2       | 4                 | 1                 | 0          | 8     |
| Faculty   | 0              | 5              | 2       | 5                 | 0                 | 0          | 12    |
| Grad      | 3              | 9              | 7       | 13                | 6                 | 0          | 38    |
| Undergrad | 2              | 7              | 4       | 8                 | 5                 | 1          | 27    |
| Alumni    | 0              | 0              | 1       | 3                 | 3                 | 0          | 7     |
| Public    | 0              | 0              | 2       | 4                 | 0                 | 0          | 6     |
| Totals    | 5              | 24             | 18      | 41                | 15                | 1          | 104   |



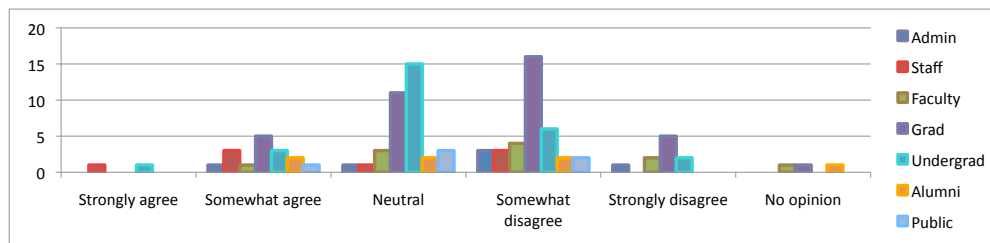
**I prefer to use applications with 3-dimensional displays when possible.**

|                    | Strongly agree | Somewhat agree | Neutral | Somewhat disagree | Strongly disagree | No opinion | Total |
|--------------------|----------------|----------------|---------|-------------------|-------------------|------------|-------|
| Admin              | 0              | 2              | 3       | 1                 | 0                 | 0          | 6     |
| Staff              | 1              | 3              | 1       | 2                 | 0                 | 1          | 8     |
| Faculty            | 1              | 2              | 5       | 2                 | 1                 | 1          | 12    |
| Grad students      | 2              | 8              | 11      | 9                 | 8                 | 0          | 38    |
| Undergrad students | 0              | 8              | 12      | 3                 | 2                 | 1          | 26    |
| Alumni             | 1              | 1              | 4       | 1                 | 0                 | 0          | 7     |
| Public             | 0              | 0              | 4       | 2                 | 0                 | 0          | 6     |
| Totals             | 5              | 24             | 40      | 20                | 11                | 3          | 103   |



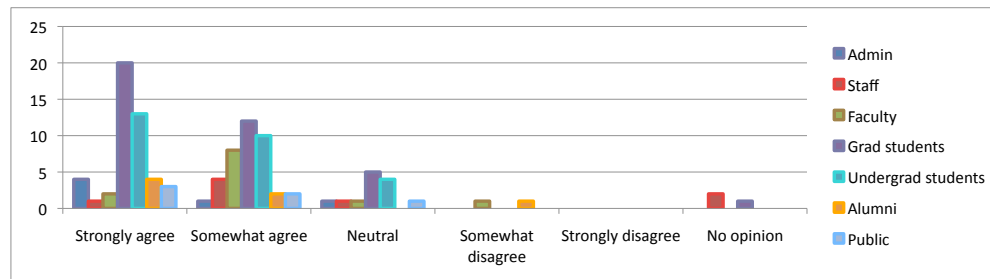
**I prefer to use applications with animations when possible.**

|           | Strongly agree | Somewhat agree | Neutral | Somewhat disagree | Strongly disagree | No opinion | Total |
|-----------|----------------|----------------|---------|-------------------|-------------------|------------|-------|
| Admin     | 0              | 1              | 1       | 3                 | 1                 | 0          | 6     |
| Staff     | 1              | 3              | 1       | 3                 | 0                 | 0          | 8     |
| Faculty   | 0              | 1              | 3       | 4                 | 2                 | 1          | 11    |
| Grad      | 0              | 5              | 11      | 16                | 5                 | 1          | 38    |
| Undergrad | 1              | 3              | 15      | 6                 | 2                 | 0          | 27    |
| Alumni    | 0              | 2              | 2       | 2                 | 0                 | 1          | 7     |
| Public    | 0              | 1              | 3       | 2                 | 0                 | 0          | 6     |
| Totals    | 2              | 16             | 36      | 36                | 10                | 3          | 103   |



**I prefer to use open source (free) software rather than proprietary software whenever feasible.**

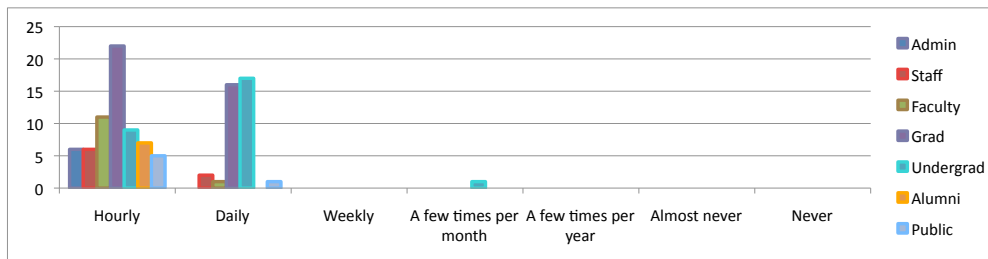
|                    | Strongly agree | Somewhat agree | Neutral | Somewhat disagree | Strongly disagree | No opinion | Total |
|--------------------|----------------|----------------|---------|-------------------|-------------------|------------|-------|
| Admin              | 4              | 1              | 1       | 0                 | 0                 | 0          | 6     |
| Staff              | 1              | 4              | 1       | 0                 | 0                 | 2          | 8     |
| Faculty            | 2              | 8              | 1       | 1                 | 0                 | 0          | 12    |
| Grad students      | 20             | 12             | 5       | 0                 | 0                 | 1          | 38    |
| Undergrad students | 13             | 10             | 4       | 0                 | 0                 | 0          | 27    |
| Alumni             | 4              | 2              | 0       | 1                 | 0                 | 0          | 7     |
| Public             | 3              | 2              | 1       | 0                 | 0                 | 0          | 6     |
| Totals             | 47             | 39             | 13      | 2                 | 0                 | 3          | 104   |



**On average, how often to you use the following software or applications?**

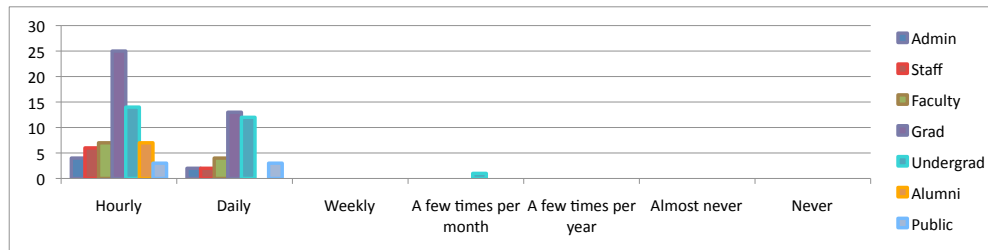
**Email**

|           | Hourly | Daily | Weekly | A few times per month | A few times per year | Almost never | Never | Total |
|-----------|--------|-------|--------|-----------------------|----------------------|--------------|-------|-------|
| Admin     | 6      | 0     | 0      | 0                     | 0                    | 0            | 0     | 6     |
| Staff     | 6      | 2     | 0      | 0                     | 0                    | 0            | 0     | 8     |
| Faculty   | 11     | 1     | 0      | 0                     | 0                    | 0            | 0     | 12    |
| Grad      | 22     | 16    | 0      | 0                     | 0                    | 0            | 0     | 38    |
| Undergrad | 9      | 17    | 0      | 1                     | 0                    | 0            | 0     | 27    |
| Alumni    | 7      | 0     | 0      | 0                     | 0                    | 0            | 0     | 7     |
| Public    | 5      | 1     | 0      | 0                     | 0                    | 0            | 0     | 6     |
| Totals    | 66     | 37    | 0      | 1                     | 0                    | 0            | 0     | 104   |



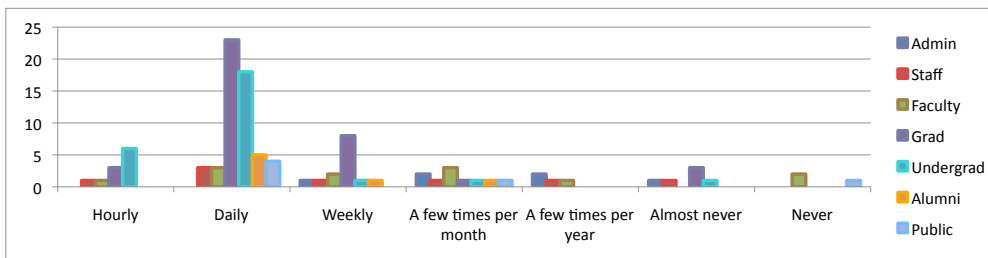
**Web browser**

|           | Hourly | Daily | Weekly | A few times per month | A few times per year | Almost never | Never | Total |
|-----------|--------|-------|--------|-----------------------|----------------------|--------------|-------|-------|
| Admin     | 4      | 2     | 0      | 0                     | 0                    | 0            | 0     | 6     |
| Staff     | 6      | 2     | 0      | 0                     | 0                    | 0            | 0     | 8     |
| Faculty   | 7      | 4     | 0      | 0                     | 0                    | 0            | 0     | 11    |
| Grad      | 25     | 13    | 0      | 0                     | 0                    | 0            | 0     | 38    |
| Undergrad | 14     | 12    | 0      | 1                     | 0                    | 0            | 0     | 27    |
| Alumni    | 7      | 0     | 0      | 0                     | 0                    | 0            | 0     | 7     |
| Public    | 3      | 3     | 0      | 0                     | 0                    | 0            | 0     | 6     |
| Totals    | 66     | 36    | 0      | 1                     | 0                    | 0            | 0     | 103   |



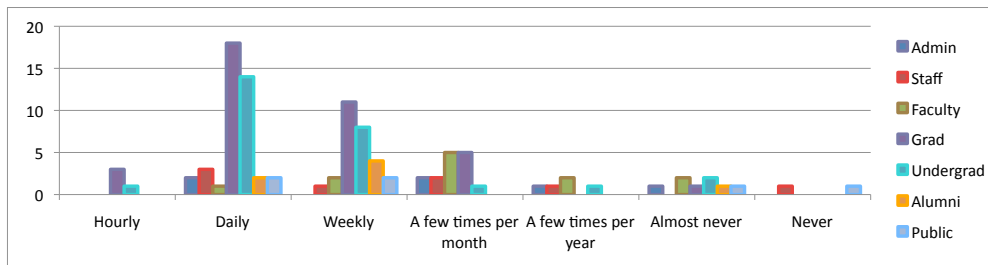
**Social Media**

|           | Hourly | Daily | Weekly | A few times per month | A few times per year | Almost never | Never | Total |
|-----------|--------|-------|--------|-----------------------|----------------------|--------------|-------|-------|
| Admin     | 0      | 0     | 1      | 2                     | 2                    | 1            | 0     | 6     |
| Staff     | 1      | 3     | 1      | 1                     | 1                    | 1            | 0     | 8     |
| Faculty   | 1      | 3     | 2      | 3                     | 1                    | 0            | 2     | 12    |
| Grad      | 3      | 23    | 8      | 1                     | 0                    | 3            | 0     | 38    |
| Undergrad | 6      | 18    | 1      | 1                     | 0                    | 1            | 0     | 27    |
| Alumni    | 0      | 5     | 1      | 1                     | 0                    | 0            | 0     | 7     |
| Public    | 0      | 4     | 0      | 1                     | 0                    | 0            | 1     | 6     |
| Totals    | 11     | 56    | 14     | 10                    | 4                    | 6            | 3     | 104   |



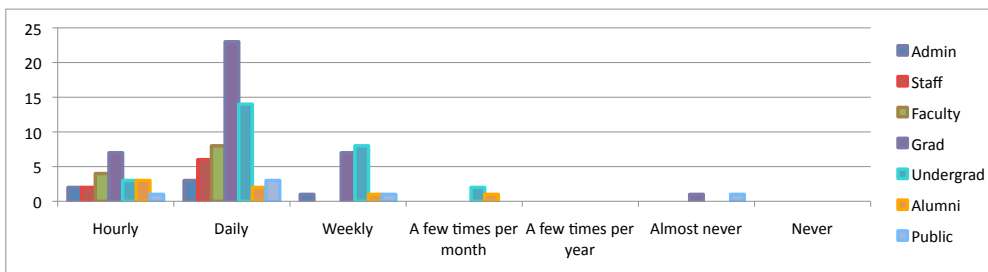
**Entertainment**

|           | Hourly | Daily | Weekly | A few times per month | A few times per year | Almost never | Never | Total |
|-----------|--------|-------|--------|-----------------------|----------------------|--------------|-------|-------|
| Admin     | 0      | 2     | 0      | 2                     | 1                    | 1            | 0     | 6     |
| Staff     | 0      | 3     | 1      | 2                     | 1                    | 0            | 1     | 8     |
| Faculty   | 0      | 1     | 2      | 5                     | 2                    | 2            | 0     | 12    |
| Grad      | 3      | 18    | 11     | 5                     | 0                    | 1            | 0     | 38    |
| Undergrad | 1      | 14    | 8      | 1                     | 1                    | 2            | 0     | 27    |
| Alumni    | 0      | 2     | 4      | 0                     | 0                    | 1            | 0     | 7     |
| Public    | 0      | 2     | 2      | 0                     | 0                    | 1            | 1     | 6     |
| Totals    | 4      | 42    | 28     | 15                    | 5                    | 8            | 2     | 104   |



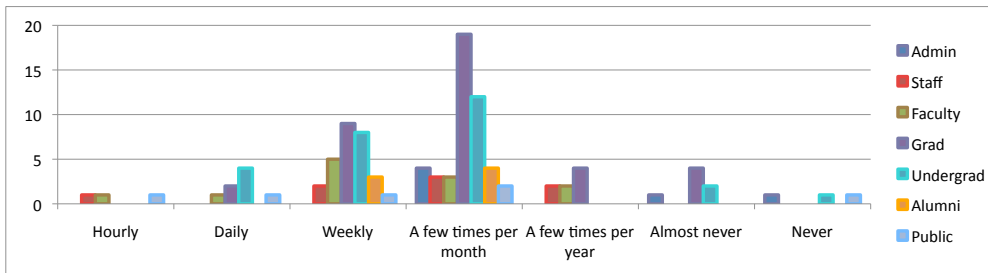
**Office functions**

|           | Hourly | Daily | Weekly | A few times per month | A few times per year | Almost never | Never | Total |
|-----------|--------|-------|--------|-----------------------|----------------------|--------------|-------|-------|
| Admin     | 2      | 3     | 1      | 0                     | 0                    | 0            | 0     | 6     |
| Staff     | 2      | 6     | 0      | 0                     | 0                    | 0            | 0     | 8     |
| Faculty   | 4      | 8     | 0      | 0                     | 0                    | 0            | 0     | 12    |
| Grad      | 7      | 23    | 7      | 0                     | 0                    | 1            | 0     | 38    |
| Undergrad | 3      | 14    | 8      | 2                     | 0                    | 0            | 0     | 27    |
| Alumni    | 3      | 2     | 1      | 1                     | 0                    | 0            | 0     | 7     |
| Public    | 1      | 3     | 1      | 0                     | 0                    | 1            | 0     | 6     |
| Totals    | 22     | 59    | 18     | 3                     | 0                    | 2            | 0     | 104   |



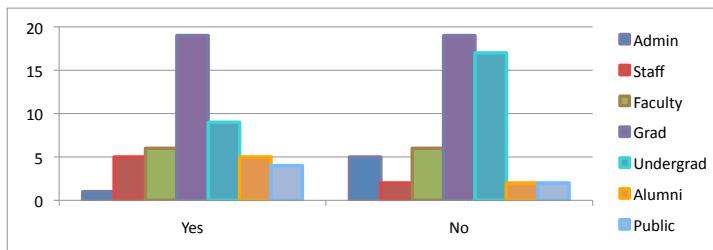
**Photo organizing/editing**

|           | Hourly | Daily | Weekly | A few times per month | A few times per year | Almost never | Never | Total |
|-----------|--------|-------|--------|-----------------------|----------------------|--------------|-------|-------|
| Admin     | 0      | 0     | 0      | 4                     | 0                    | 1            | 1     | 6     |
| Staff     | 1      | 0     | 2      | 3                     | 2                    | 0            | 0     | 8     |
| Faculty   | 1      | 1     | 5      | 3                     | 2                    | 0            | 0     | 12    |
| Grad      | 0      | 2     | 9      | 19                    | 4                    | 4            | 0     | 38    |
| Undergrad | 0      | 4     | 8      | 12                    | 0                    | 2            | 1     | 27    |
| Alumni    | 0      | 0     | 3      | 4                     | 0                    | 0            | 0     | 7     |
| Public    | 1      | 1     | 1      | 2                     | 0                    | 0            | 1     | 6     |
| Totals    | 3      | 8     | 28     | 47                    | 8                    | 7            | 3     | 104   |



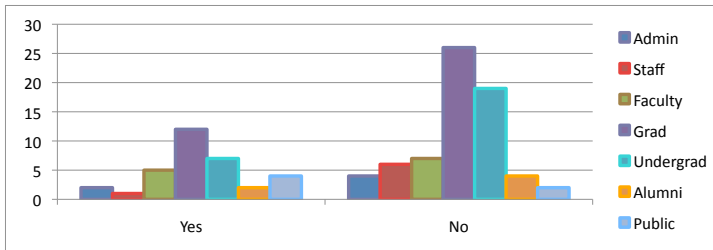
**Have you ever assisted in the managing of web content such as a wiki (for example wikipedia), a blog, or other methods of presenting online data?**

|           | Yes | No | Total |
|-----------|-----|----|-------|
| Admin     | 1   | 5  | 6     |
| Staff     | 5   | 2  | 7     |
| Faculty   | 6   | 6  | 12    |
| Grad      | 19  | 19 | 38    |
| Undergrad | 9   | 17 | 26    |
| Alumni    | 5   | 2  | 7     |
| Public    | 4   | 2  | 6     |
| Totals    | 49  | 53 | 102   |



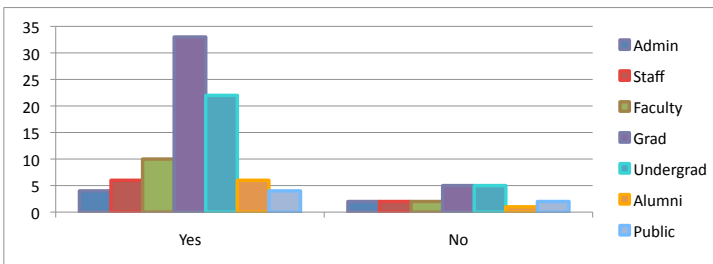
**Are there any software programs that you have stopped using because of frustration?**

|           | Yes | No | Total |
|-----------|-----|----|-------|
| Admin     | 2   | 4  | 6     |
| Staff     | 1   | 6  | 7     |
| Faculty   | 5   | 7  | 12    |
| Grad      | 12  | 26 | 38    |
| Undergrad | 7   | 19 | 26    |
| Alumni    | 2   | 4  | 6     |
| Public    | 4   | 2  | 6     |
| Totals    | 33  | 68 | 101   |



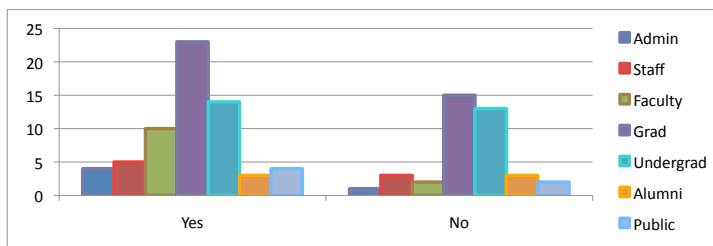
**Have you downloaded a web browser plug-in?**

|           | Yes | No | Total |
|-----------|-----|----|-------|
| Admin     | 4   | 2  | 6     |
| Staff     | 6   | 2  | 8     |
| Faculty   | 10  | 2  | 12    |
| Grad      | 33  | 5  | 38    |
| Undergrad | 22  | 5  | 27    |
| Alumni    | 6   | 1  | 7     |
| Public    | 4   | 2  | 6     |
| Totals    | 85  | 19 | 104   |



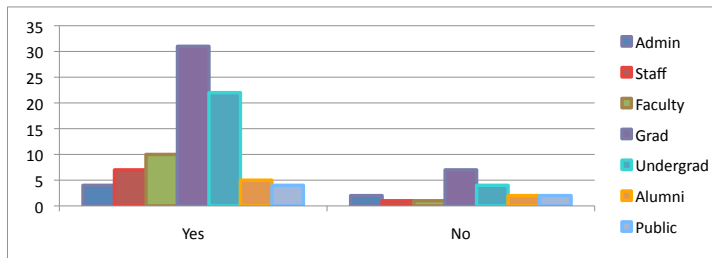
**Do you consider this to be a nuisance?**

|           | Yes | No | Total |
|-----------|-----|----|-------|
| Admin     | 4   | 1  | 5     |
| Staff     | 5   | 3  | 8     |
| Faculty   | 10  | 2  | 12    |
| Grad      | 23  | 15 | 38    |
| Undergrad | 14  | 13 | 27    |
| Alumni    | 3   | 3  | 6     |
| Public    | 4   | 2  | 6     |
| Totals    | 63  | 39 | 102   |



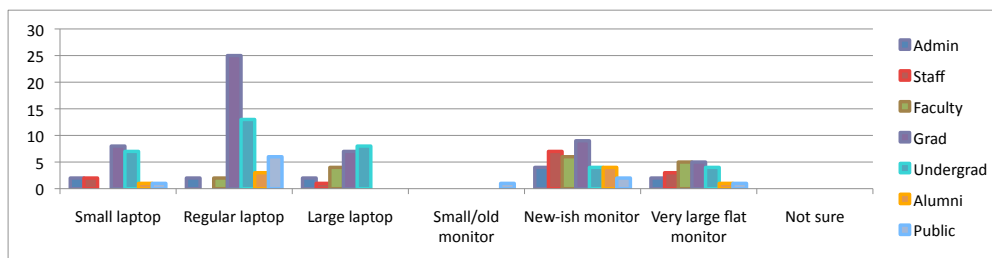
**Have you ever abandoned an activity because it required a plug-in to be downloaded?**

|           | Yes | No | Total |  |
|-----------|-----|----|-------|--|
| Admin     | 4   | 2  | 6     |  |
| Staff     | 7   | 1  | 8     |  |
| Faculty   | 10  | 1  | 11    |  |
| Grad      | 31  | 7  | 38    |  |
| Undergrad | 22  | 4  | 26    |  |
| Alumni    | 5   | 2  | 7     |  |
| Public    | 4   | 2  | 6     |  |
| Totals    | 83  | 19 | 102   |  |



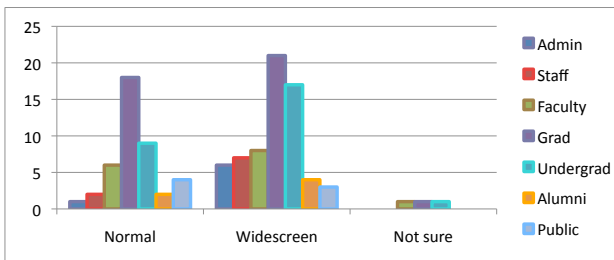
**What size and style is your computer monitor? (multiple responses can be selected)**

|           | Small laptop | Regular laptop | Large laptop | Small/old monitor | New-ish monitor | Very large flat monitor | Not sure | Total |
|-----------|--------------|----------------|--------------|-------------------|-----------------|-------------------------|----------|-------|
| Admin     | 2            | 2              | 2            | 2                 | 0               | 4                       | 2        | 12    |
| Staff     | 2            | 0              | 1            | 0                 | 0               | 7                       | 3        | 13    |
| Faculty   | 0            | 2              | 4            | 0                 | 0               | 6                       | 5        | 17    |
| Grad      | 8            | 25             | 7            | 0                 | 0               | 9                       | 5        | 54    |
| Undergrad | 7            | 13             | 8            | 0                 | 0               | 4                       | 4        | 36    |
| Alumni    | 1            | 3              | 0            | 0                 | 0               | 4                       | 1        | 9     |
| Public    | 1            | 6              | 0            | 1                 | 2               | 1                       | 0        | 11    |
| Totals    | 21           | 51             | 22           | 1                 | 36              | 21                      | 0        | 152   |



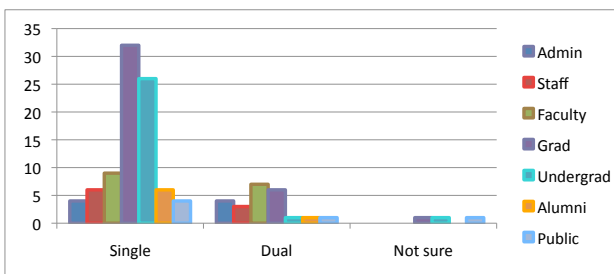
**What type of monitor do you have? (multiple responses can be selected)**

|           | Normal | Widescreen | Not sure | Total |
|-----------|--------|------------|----------|-------|
| Admin     | 1      | 6          | 0        | 7     |
| Staff     | 2      | 7          | 0        | 9     |
| Faculty   | 6      | 8          | 1        | 15    |
| Grad      | 18     | 21         | 1        | 40    |
| Undergrad | 9      | 17         | 1        | 27    |
| Alumni    | 2      | 4          | 0        | 6     |
| Public    | 4      | 3          | 0        | 7     |
| Totals    | 42     | 66         | 3        | 111   |



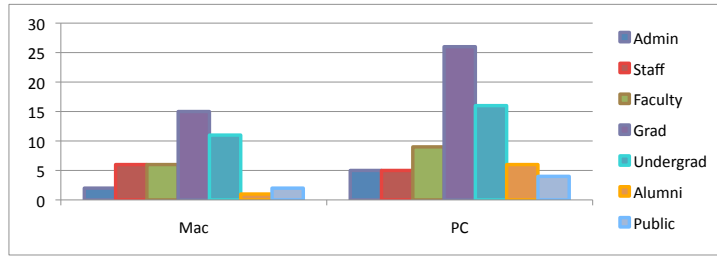
**Do you use dual monitors? (multiple responses can be selected)**

|           | Single | Dual | Not sure | Total |
|-----------|--------|------|----------|-------|
| Admin     | 4      | 4    | 0        | 8     |
| Staff     | 6      | 3    | 0        | 9     |
| Faculty   | 9      | 7    | 0        | 16    |
| Grad      | 32     | 6    | 1        | 39    |
| Undergrad | 26     | 1    | 1        | 28    |
| Alumni    | 6      | 1    | 0        | 7     |
| Public    | 4      | 1    | 1        | 6     |
| Totals    | 87     | 23   | 3        | 113   |



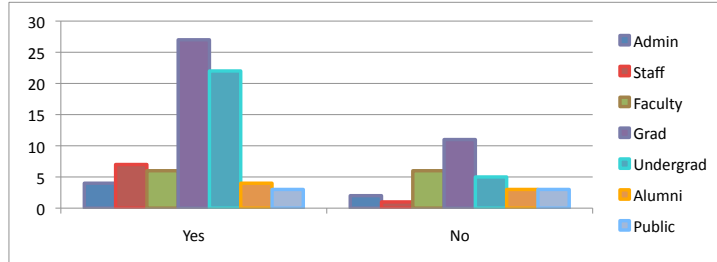
**Do you use a Mac or a PC? (multiple responses can be selected)**

|           | Mac | PC | Total |  |
|-----------|-----|----|-------|--|
| Admin     | 2   | 5  | 7     |  |
| Staff     | 6   | 5  | 11    |  |
| Faculty   | 6   | 9  | 15    |  |
| Grad      | 15  | 26 | 41    |  |
| Undergrad | 11  | 16 | 27    |  |
| Alumni    | 1   | 6  | 7     |  |
| Public    | 2   | 4  | 6     |  |
| Totals    | 43  | 71 | 114   |  |



**Would you consider using a small handheld device (for example a cellphone) to explore an online mapping application?**

|           | Yes | No | Total |  |
|-----------|-----|----|-------|--|
| Admin     | 4   | 2  | 6     |  |
| Staff     | 7   | 1  | 8     |  |
| Faculty   | 6   | 6  | 12    |  |
| Grad      | 27  | 11 | 38    |  |
| Undergrad | 22  | 5  | 27    |  |
| Alumni    | 4   | 3  | 7     |  |
| Public    | 3   | 3  | 6     |  |
| Totals    | 73  | 31 | 104   |  |



## Appendix M: Responses to interview questions

- Should the background information on the project appear on the welcome page?
  - No participants wanted the background information on the welcome page.
- Which map should be first? (of the maps available in the header bar)
  - Responses were generally indifferent to the opening map.
  - One participant strongly supported the countries map.
  - Another participant suggested either the countries map or the faculties map, but decided the countries map was probably the better choice.
- Were you able to easily find what you were looking for?
  - One participant reiterated the desire to have a base map with a less cluttered appearance (fewer road details in particular), which would help to see the icons and to learn the general layout of the country.
  - All other participants did not have anything to add from their responses following the task completion.
- Has enough detail been provided about each international connection?
  - All participants were positive about the level of detail currently provided.
  - One participant indicated that some of the details, such as the names and course numbers for partner universities, may be difficult to keep current. A link to either the partner universities website, or to the UVic faculty with which the partner is associated, may simplify the data maintenance.
  - Another participant responded that some columns in the accompanying data tables require headings that are clearer. The links to websites in particular were not always clear if it was linking to an external website or to a UVic website.

- Are there any more details that should be made available?
  - Extra details were not requested by any participants.
  - Five participants indicated that less detail that was guaranteed to be current was more important than more detail that would be difficult to maintain currency.
- Is there any aspects of the overall mapping application that you feel needs improvement? Works well?
  - One participant reaffirmed the need for markers to have more distinct colour differences.
  - Three other participants expressed a desire for UVic to appear on the map. One of these suggested that links could be provided to the faculties and to programs such as Co-op and Research Services.
  - Two other participants reiterated that clicking on markers need to be 100% effective. With the popup title looking like a link, trying to click on the word (e.g. 'Japan' beside Japan's icon), can make the popup disappear and the click unsuccessful.
  - Another participant responded that some menus and text could be shortened to minimize the necessary reading, and the amount of screen space being filled. Keeping as much "above the fold" (an expression relating to the value of text printed on the top half of a newspaper) was emphasized. In the participant's opinion based on his experiences, it was very important to have all information, or at least all important information, available to users without requiring any scrolling.
  - This participant also felt that the data table showing all connections should default to being sorted by country rather than by type of connection. The participant felt

that it would be more useful to the average user, as well as consistent with the mapping application's use of the countries map as the opening map.

- Another participant responded that the data table showing all connections could be simplified by removing all columns that were not universal. The table would therefore have only a few columns displayed, but a connection could be clicked on to reveal all the information available.
- Do you have any other suggestions about how to improve the product?
  - Six participants responded that the most important aspect of an application of this type was to ensure completeness and currency of data.
  - One of the participants suggested that for non-faculty markers, a generic blue should be used, rather than a yellow, to reflect UVic's use of blue in their website design (blue is used for menu and header bars).