



WPI



History and Impact of the Washington, D.C. Project Center

An Interactive Qualifying Project
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by

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This report represents work of WPI undergraduate students submitted to the faculty as evidence of a degree requirement. WPI routinely publishes these reports on its website without editorial or peer review.

For more information about the projects program at WPI, see

<https://www.wpi.edu/project-based-learning>

Abstract

The Washington, D.C. Project Center (WPC) was established in 1974 by WPI as part of a major curricular and educational change. Over the past 43 years there has not been a systematic effort to document the history of the WPC nor has there been any thorough investigations into the impacts of the projects completed. Interviews and surveys of students, advisors, and sponsors were conducted in order to provide a sound, data based analysis of the Washington Project Center and its programs since inception. A website and database were created to display the work of the current project and the past work done at the project center. The surveys and interviews show that the greatest impact of past projects is the effect on the students and the sponsors and that most have a strong positive experience. These methods also produced a list of recommendations for program improvement at the WPC and WPI's Global Projects Program overall.

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Table of Contents

Abstract	i
Acknowledgements	ii
Table of Contents	iii
Table of Figures	v
Table of Tables	vi
Executive Summary	vii
Chapter 1: Introduction	1xi
Chapter 2: Background	3
Establishing the WPI Plan	3
Background of Washington, D.C.	4
The Washington, D.C. Project Center	4
WPC Record Keeping	6
Defining Impact	7
Learning From Other Project Centers	10
Chapter 3: Methodology	20
Mission Statement and Objectives	21
Created an Impact Model to Guide an Investigation on Impact	22
Conducted Interviews to Collect Qualitative Data on the Impact of WPC Projects	24
Conducted WPC Alumni Survey to collect Quantitative and Qualitative Data on WPC Projects	28
Compiled Database of Past Students and Projects at the WPC	31
Created a Website to Document the History and Impact of the WPC	32
Chapter 4: Findings	35
Interviews	35
WPC Alumni Survey	40
Chapter 5: Outcomes / Accomplishments	45
Database	45
WPC Website	46
Chapter 6: Recommendations	49
References	51
Appendices	54
Appendix A - Impact Model	54
	iii

Appendix B - Melbourne Project Center Home Page	55
Appendix C - London Project Center Alumni Survey	56
Appendix D - Melbourne Project Center Alumni Survey	60
Appendix E - Melbourne Project Center Sponsor Interview Script	68
Appendix F - WPI Faculty Advisor Interview Script	69
Appendix G - Interview Request Email for WPC Sponsors	70
Appendix H - WPC Sponsor Interview Script	71
Appendix I - WPC Alumni Survey	72
Appendix J - WPC Alumni Survey Introduction Email	81
Appendix K - Gender of WPC Alumni Survey Respondents	83
Appendix L - Past vs. Present WPC Alumni Responses on the WPC	84
Appendix M - Authorship Page	87

Table of Figures

Figure I: Impact Model	vii
Figure II: WPC Website Home Page	ix
Figure III: Screenshot of Final Database of Past Students	x
Figure IV: WPC Alumni's Enhanced Abilities	xi
Figure 2.1: First WPC Project Team and Sponsors in 1974	5
Figure 2.2: Essential Relationships and Project Context	8
Figure 2.3: Impacts Model	9
Figure 2.4: Projects Organized By Theme on MPC Website	12
Figure 2.5: Example Blog Post from MPC Website	12
Figure 2.6: LPC Timeline	14
Figure 2.7: MPC Details on Each Impact Group	15
Figure 2.8: MPC Sponsor Map	16
Figure 2.9: MPC Historical Timeline	17
Figure 3.1: Impact Model	23
Figure 3.2: Survey Distribution Schedule	30
Figure 3.3: Flowchart of Website	33
Figure 4.1: Number of Survey Responses per Year	41
Figure 4.2: Percentage of WPC Alumni Surveyed Whose Abilities Were Enhanced	42
Figure 4.3: Comparing Students Opinion on the WPC	44
Figure 5.1: Screenshot of Final Database 1	45
Figure 5.2: Screenshot of Final Database 2	46
Figure 5.3: WPC Website Home Page	47
Figure 5.4: WPC Timeline Showcasing Students Experiences at the WPC	47
Figure 5.5: Project Page for USPTO Team in 2016	48

Table of Tables

Table 2.1: A Model of Potential Community Engagement Impacts Summarized (Jiusto, Vaz, 2016)	8
Table 2.2: Sponsor Type Coded Categories	17
Table 2.3: Coded Theme Categories	18
Table 2.4: Coded Deliverable Type Categories	19
Table 3.1: Faculty Interviewed in Worcester, MA	25
Table 3.2: Faculty Interviewed in Washington, D.C.	25
Table 3.3: Sponsor Contact Information Sources	26
Table 3.4: Count of Contact Information Available	26
Table 3.5: Examples of questions from Advisor Interview Script and designated purpose	27
Table 3.6: Examples of questions from Sponsor Interview Script and designated purpose	28
Table 3.7: Key Aspects of the Survey	29
Table 3.8: Sources for WPC Alumni Contact Information	30
Table 3.9: Database Information and its Location	32
Table 3.10: Table of Website Information	34
Table 4.1: General Response of Advisor Interview Questions	36
Table 4.2: General Response of Sponsor Interview Questions	37
Table 4.3: List of Advice for Students	38
Table 4.4: List of Advice for Sponsors	39
Table 4.5: List of Recommendations for WPI	40
Table 4.6: Alumni Survey Feedback	43

Executive Summary

Worcester Polytechnic Institute has been an active leader in project-based learning since the 1960's. WPI passed this new academic plan in 1970 which integrated project-based learning in the academic curriculum, allowing students the opportunity to gain hands-on experience in addition to the classic classroom setting. This "WPI Plan" continued development and was implemented in 1972. Since its early years it has further advanced and now incorporates six ideals: Pursue Your Passion, Learn How to Learn, Project-Based Learning, Global Immersion, Resources and Support Systems, and Personal Impact - as well as the motto of WPI "Lehr und Kunst," which translates to "Theory and Practice". The "WPI Plan" has also inspired the creation of the Interactive Qualifying Project (IQP). In 1974 the first off-campus project center was established in Washington, D.C. Since establishment, record-keeping of the projects has been inconsistent and incomplete. The physical copies took up too much space to be kept and were disposed of after five years. There also hasn't been an attempt to document or analyze the impacts these projects had, either on their organizations or elsewhere. Therefore this report had two foci. The first was creating a complete database of all the projects that came out of the Washington Project Center. The second was identifying and analyzing the impacts of projects. Since there have been over 300 projects with more than 1,200 students, the potential for impact is great.

Methodology

While on campus the focus was to gather project center information and study impacts. Time was spent in the WPI Archives, interviewing faculty members, and collecting information - lists of students who have attended the WPC, a catalogue of the project information, and information on the WPI Plan which inspired the IQP program. Using this information, a complete database of projects was created using Microsoft Excel and Google Drive and delivered to Dean Rissmiller. To display this information clearly and attractively, a website was created using a WordPress template provided by WPI. Users can learn about projects by filtering them by sponsor, year, and project theme (WPC, 2017). One of the purposes of the website is to serve as an educational reference for potential students and sponsors. The website includes relevant information for prospective students and steps that organizations should take to sponsor a project. A timeline was also added to the website that displays pictures shared by alumni. Permission from WPI's IT Department was necessary for the implementation and installation of this timeline widget. The timeline separates the projects completed by decade. Users are able to navigate years of projects and are redirected to the projects of the selected year. In an attempt to make the website fun and attractive, a Flickr account was also created to store photos of D.C. The widget pulls the 10 most recent photos uploaded and displays them at the bottom of the home page.

Studying impact was more difficult. There isn't one standard definition of impact, and additionally there are few interpretive models to illustrate it. Fortunately, two models created by WPI faculty were found and used as reference (Jiusto, Vaz, 2016). Using these as references along with additional research, a new impact model was created. This model defines four different levels of impact: individual, organizational, communal, and systemic (Figure I). For clarity, there are impact and stakeholder examples provided for each level. This model was kept in mind when creating survey and interview questions. From these, the group was able to analyze impacts quantitatively as well as gain valuable anecdotes and evidence illustrating impacts from student work. These results are primarily

displayed on the website under “Impacts on Students” and “Impacts of Projects.” Any person, affiliated with WPI or not, can go on the website and learn about the projects and impact the Washington Project Center has had over its extensive history.



Figure I: Impact Model

Results

To tackle this project, contact needed to be established with as many alumni and project sponsors as possible. An alumni survey of 48 questions asked the Basic Information, Personal Impact, Other Impacts, and Conclusion. After many reviews, the project sponsor, Dean Kent Rissmiller, assisted in contacting WPI's Alumni Office to approve the survey as well as get email addresses from WPC alumni. After approval and final edits, the survey was distributed to 705 Washington Project Center alumni. After 2.5 weeks, 187 responses were received, a 26.6% response rate. Over the entirety of the project center 1,222 students have attended the project center from 1974 - 2016.

Interviews were the major method of learning about the impacts of projects. By interviewing the project liaisons who worked directly with the students within the organization, a clear idea of the outcomes of the project were gained. After interviewing 23 project liaisons over the course of three weeks, it was clear WPI projects had major impacts on organizations. Because of the varying project foci, the potential impacts are only as large as the projects allow them to be. The information generated from these interviews is primarily displayed through the website, as well as a sponsor recommendations list for the IGSD.



Figure II: WPC Website Home Page

Another result of this project was the website centered on the project center. The website served to display the work completed for this report, the work other students have done, and general information on the project center. There are four main sections within this site that users can visit (Figure II). The “About” section contains information on WPI, information on the project center, and a timeline showing pictures and anecdotes of WPI students over the past 43 years. In the “Students” section, students can look at the impact that WPI projects have on students as well as learn more about completing an IQP in Washington if they are in their freshman or sophomore year. Within “Sponsors” there is a recognition of the Washington Project Center’s past and current sponsors, impacts past groups have had on organizations, and information for organizations interested in partnering with WPI. Finally, the “Projects” section contains different pages that filter the project pages by sponsor, year, and theme.

The database (Figure III) of past students displays information on the over 1,200 students that have completed their IQP in Washington. Each student entry contains major, graduating year, and advisor. Then, each student has project information including project title, abstract, sponsoring organization, and eProjects# if applicable.

A	B	C	D	F	G	H	I	J	K	L	M
Student	Email	Current Business Info.	Major 1	Graduation Year	Project Term	ProjectYear	Center Director	Advisor 1	Advisor 2	Sponsoring Organization	Type of Organization
Student 1	student@email	#N/A	ME	1975	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Commerce	NG
Student 2	student@email	#N/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Commerce	NG
Student 3	student@email	#N/A	PH	1975	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Commerce	NG
Student 4	student@email	#N/A	CS	1975	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Commerce	NG
Student 5	student@email	#N/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Health, Education & Welfare	NG
Student 6	student@email	#N/A	LS	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Health, Education & Welfare	NG
Student 7	student@email	#N/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Housing and Urban Development	NG
Student 8	student@email	#N/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Housing and Urban Development	NG
Student 9	student@email	#N/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Housing and Urban Development	NG
Student 10	student@email	#N/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Housing and Urban Development	NG
Student 11	student@email	#N/A	CH	1975	A	1974	Frank Lutz	J. Demetry	F. Lutz	Public Technology Institute	PC
Student 12	student@email	#N/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	Public Technology Institute	PC
Student 13	student@email	#N/A	CM	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	National Association of Manufacturers	PS
Student 14	student@email	#N/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	National Association of Manufacturers	PS
Student 15	student@email	#N/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	National Association of Manufacturers	PS
Student 16	student@email	#N/A	EC	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	Public Technology Institute	PC
Student 17	student@email	#N/A	MA	1975	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Commerce	NG
Student 18	student@email	#N/A	ME	1975	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Commerce	NG
Student 19	student@email	#N/A	ME	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Commerce	NG
Student 20	student@email	#N/A	CE	1975	B	1974	Frank Lutz	S. Staples	F. Lutz	Public Technology Institute	PC
Student 21	student@email	#N/A	ME	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	Public Technology Institute	PC
Student 22	student@email	#N/A	MG	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Transportation	NG
Student 23	student@email	#N/A	EE	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Transportation	NG
Student 24	student@email	#N/A	CE	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Transportation	NG

Figure III: Screenshot of Final Database of Past Students and Projects

Analysis

The interviews and survey were analyzed to determine the impact of WPI projects on the many stakeholders involved. Interview questions were asked with the impacts model detailed in this report in mind. Through this, specific examples of impact were found and noted. Some of the notable examples are displayed through the website. The interviews also produced recommendations for WPI and for sponsors. Sponsors such as the U.S. Patent and Trademark Office and the U.S. Consumer Product Safety Commission have partnered with WPI for many years. With their experience they were able to offer good advice for new and existing sponsors on how to produce a successful project. Also, even though the experience with WPI teams was generally positive, most sponsors had recommendations of some sort for WPI or an issue that can occur while working with WPI teams. These issues and recommendations had common themes across sponsors. Communication between sponsor, students, and advisors was one of the biggest areas of improvement for the WPC. This report's recommendations incorporate these themes in order to improve the quality of WPI projects and the WPC's relationship with its sponsors.

For the survey, overall, the alumni reported a strong positive experience and gained both personal and professional experience from their IQP experience. High percentages of alumni agreed that their abilities were enhanced due to their IQP experience in Washington (Figure IV). Interestingly, only 37% [n = 60] of students who attended the project center during the first 10 years strongly agree or somewhat agree that they would recommend students complete their IQP at the WPC. However, 81% [n = 37] of students in the past 10 years strongly agree or somewhat agreed with that same prompt. This is a significant change that stands out between the first 10 years and last 10 years at the WPC.

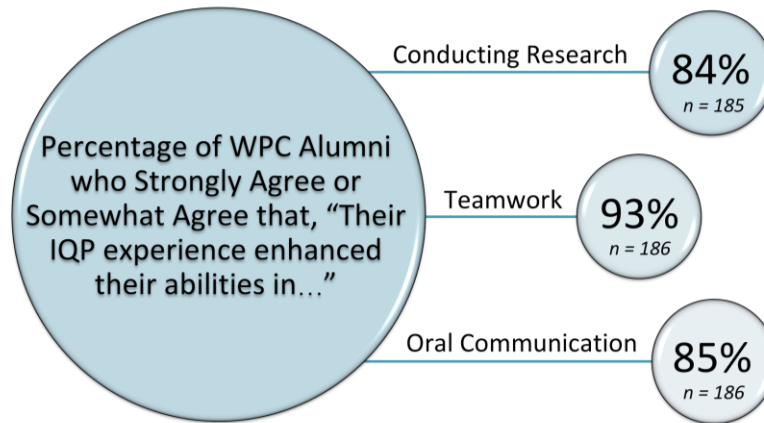


Figure IV: WPC Alumni's Enhanced Abilities

The survey also had open-response questions which allowed WPC alumni to share more diverse experiences. One section let WPC alumni provide feedback on the project center and the changes they would make are summarized in Chapter 4: Findings and support the recommendations made in this report.

Recommendations and Conclusion

In conclusion, the Washington Project Center has seen success over the past 43 years. From interviews and surveys conducted, the following seven recommendations were created to improve the quality of WPI projects at the WPC and can also be applied to other project centers.

1. During the ID 2050 course, WPC advisors should encourage students to meet with their liaison more than once.
2. During the ID 2050 course, WPC advisors should encourage students to send their academic and professional background to their liaison.
3. During the first week of the on-site term, advisors and liaisons should meet in an open-discussion about the expectations of each party.
4. During the first week of the onsite term, advisors, liaisons and students should meet to have an open-discussion about the project scope and calibrate expectations.
5. WPI should provide new sponsors and liaisons examples of successful student teams and scoping.
6. At the end of the project term students should complete evaluations on their experience with their sponsor and these results should be delivered to the sponsor.
7. In 10 years (up to WPC Director's discretion), a project should be conducted to investigate impacts and compare it to this report as well as update the website.

Other outcomes such as the website and database serve to support the WPC throughout the years. The website encourages future sponsors and students to participate in the WPC and details its history. The database is a record of all past students along with information on each of their projects.

Chapter 1: Introduction

Established in 1974, the Washington, D.C. Project Center (WPC) has been Worcester Polytechnic Institute's (WPI) longest running off-campus project center, having served over 1,000 students and over 80 sponsors. In honor of the WPC's upcoming 45th anniversary, the Interdisciplinary and Global Studies Division (IGSD) at WPI has sponsored an Interactive Qualifying Project (IQP) team to explore the impact of past projects completed at the WPC. This is part of a larger effort by WPI President, Laurie Leshin, and the IGSD, to raise awareness of WPI project impacts - inspiring the sponsorship of multiple projects which focus on assessing their project center's impact.

Unfortunately, there has not been a systematic nor consistent record of WPC project-related materials. All project reports and summaries from 1974 to the late 1990's were physical documents, and WPI did not have enough space in the library to store them all. Lack of thorough systematic documentation contributed to the lack of consistent information - making it difficult to create a thorough database, and an accurate assessment of the project center's history.

As a part of WPI's effort to raise awareness of the project work, IQP teams at other project center locations such as London and Melbourne have conducted similar projects, focusing on documenting and analyzing the history of their respective project centers. WPI faculty have also been involved in studies defining impacts; most notably, the impacts model created by Professors Jiusto and Vaz (2016) in their *Understanding Impacts* paper, which has been vital in the creation of a new impact model for this report. An evaluation study sponsored by WPI, *Long-term Impacts of Project-Based Learning in Science and Engineering* by Heinricher, Quinn, Vaz, & Rissmiller (2013), has also been a valuable resource for survey methodology and the different areas of impact that result from WPI project work.

There are several processes internal to WPI that could be improved or were missing entirely that could have provided a better understanding of the project center. Without a thorough investigation or attempt to document the projects, the history of the Washington Project Center would have remained incomplete. To fill this gap, part of this project focused on creating a new database of past students and their related project information. In 2004 WPI compiled a historical list of students dating back to when the project center was established, which included the student names, sponsors, and advisors. However, this did not include project information (Title & Abstract) or some student information (Major & Email). While this list has not been updated since 2004, it provided a key structure for the database. Unfortunately, the historical list had no information on the impacts of the projects. Other student teams found success in addressing this problem by surveying project center alumni. As mentioned earlier, WPI is interested in the impacts and outcomes of projects. This prompted IGSD to send out sponsor surveys after projects were completed, however this process only covers the past five years - leaving the other 38 years untouched. These surveys also do not probe beyond Likert questions (questions asked on a rating scale), so personal stories are not captured. All of the above is further hindered in that there is no way to publicly display all of this information. Student teams at other project centers found that using a website worked well and that the website could also be used to advertise the project center.

The project resulted in several deliverables that address these concerns. A model for impacts was created which defined four different levels of impact - individual, community, organizational, and systemic. That model was used to guide the questions asked during sponsor interviews and in the alumni

survey. Data from WPI's Gordon Library Archives and BannerWeb were used to create a database by building on a historical list of students who have attended the WPC. Once the database was established, a WPC website was created by utilizing the WordPress template chosen by WPI. It targets multiple audiences and incorporates interactive elements such as a timeline and photo gallery. The results of interviews and surveys are also displayed on the website, focusing on the impact of projects. Any person, affiliated with WPI or not, is able to go to the website and learn about past projects and the impact of those projects completed at the Washington Project Center over its extensive history. These deliverables fulfilled the goal of documenting the history and assessing the impact of the Washington, D.C. Project Center.

Chapter 2: Background

This chapter begins by introducing Worcester Polytechnic Institute's (WPI) change in educational direction in the 1960's and '70's. WPI began by implementing a new educational method, known as the WPI Plan. The plan was based on the idea that students should be able to apply their coursework to real-world experiences before entering the workforce. A component of the plan included creating a project program that stretched beyond the boundaries of the WPI campus. Washington, D.C., was chosen to begin this program and became the first off-campus project center. In order to analyze the impact of past projects completed at the WPC, models for impact were studied as reference. Other WPI project centers have completed similar projects and their methods, insights, and deliverables are summarized. This effort supported the ultimate goal in analyzing the impacts of the Washington, D.C. Project Center.

Establishing the WPI Plan

Design of The WPI Plan began in December, 1968. Harry P. Storke, President of WPI at the time, selected a group of six men to begin forming a plan to improve WPI. Storke's goal was to "[transform] the Institute from a college of competent resources into one of national renown" (WPI Past Presidents, n.d.). He continued his innovation of the school until the end of his tenure when "he saw this dream take form as an innovative academic program that would become known as the WPI Plan" (WPI Past Presidents, n.d.). The team chosen by Storke conceptualized and formed the program plans for undergraduate degrees, educational programs, graduate studies, and other significant factors of WPI's academic life. This plan has grown to incorporate six ideals: pursue your passion; learn how to learn; project-based learning; global immersion; resources and support systems; and personal impact. It also encompasses WPI's motto, 'Lehr und Kunst', translating to 'Theory and Practice'. Chrysanthe Demetry (WPC alumni, and current professor) remembers it was a "more traditional curriculum back then, I don't recall team projects in my earlier courses, they were pretty much straight lecture courses, so with the exception of chemistry labs where I had one partner, I can't recall anything prior to the IQP, and we certainly didn't have anything like the GPS (Great Problems Seminar) as an option freshman year". GPS is a WPI student's first opportunity to work in a group on a big project, and experience project based learning.

WPI courses integrate project-based learning into their curriculum by substituting final exams with projects. Most recently, a final project for a dynamics course was to build and analyze a RC car: using K'NEX pieces, an electric motor, LiPo battery, and Servo Motor. On the subject of WPI incorporating projects into courses, Dean Heinricher remarks, "Many faculty do a great job of integrating projects into courses. I think that it is important that students are challenged to do things before they are completely ready to do them. Students should be asked to solve problems where they are both integrating material learned in prior courses and also exploring terrain for the very first time". This quote illustrates how WPI is attempting to integrate and prepare its students to be able to think on their feet and prepare them for the unexpected.

WPI's Global Projects Program (GPP) division connects students with projects outside the WPI community. The GPP develops and advances project center locations as well as encourages students to

thoughtfully immerse themselves “in new cultures and tackle unstructured problems in ways that are meaningful to local sponsors in real communities” (Global Projects Program, n.d.). One of their main foci is the Interactive Qualifying Project (IQP), an opportunity for students and faculty to have a real impact on the world. This 14-week process, is usually, as put by past WPC advisor Richard Sisson, “... the first time the students actually have to complete a large project ... [causing] you either directly or indirectly to have to plan a big research project”. The IQP is an immersive process where the first seven weeks are spent learning and deciding how to tackle the project, and the following seven weeks are spent implementing the course of action. Because WPI has established over 40 project centers on 6 continents, students have many options for off-campus projects. These projects are designed to have an impact on all levels. This ideal goes hand-in-hand with what the Dean of Undergraduate Studies, Arthur Heinricher, had to say about the WPI Plan, “... students [have] to understand how their technical knowledge [has] an impact on society”. Because of these goals and ideals, WPI chose to establish its first project center located in Washington, D.C.

Background of Washington, D.C.

The capital of the United States of America, Washington, D.C., is a unique city in that it is not part of any surrounding states. In order to understand why D.C. was chosen to be the site of the first project center, it’s important to understand the historical context of the 1970’s. In March of 1973 the final American soldier left Vietnam, the war continued, but not with American boots on the ground (Cosmas, G. A. 2003). That June, the media reported that a Republican security officer was one of several involved in a break-in at the Democratic Party’s Watergate Office Headquarters (Bumgardner, S. 2007). An oil crisis was occurring nationwide, with supplies scarce and prices rising (Moss, K. B. 2003). New research studies by the California government demonstrated that automotive emissions are damaging to human health. In response, President Richard Nixon established the Environmental Protection Agency (Britannica Academic, 2017).

In the wake of all of these societal issues, Washington, D.C., was chosen by WPI because it presented a significant number of first hand opportunities for students to see the relationship between technological and social issues.

The Washington, D.C. Project Center

In 1974 the first project center based on the WPI Plan was established in Washington, D.C., because of the city’s significant density of organizations and importance to the country (“150 Years: Imagine More”, 2015) (Bernard, 1984). This experience added a new element to the Interactive Qualifying Project (IQP). Previously, students performed their IQP on-campus with local organizations and WPI faculty (S. Vernon-Gerstenfeld, personal communication, September 29, 2017). The early projects completed in Washington, D.C., had a scope and magnitude that was both uncommon in the academic community and were like nothing that prior students had ever experienced. A long-time director of the WPC indicated that the greatest impact of the WPC is that it was the first project center founded by WPI and was therefore a model for all other project centers that followed (S. Vernon-Gerstenfeld,

personal communication, September 29, 2017). By 2017, over 1000 students had completed their IQP at the Washington Project Center (Rissmiller, 2017).



Figure 2.1: First WPC Project Team and Sponsors in 1974 (“150 Years: Imagine More,” 2015)

Students’ First Concerns about the Project Center

Although this experience was exciting and new for the students, they still had some concerns and some didn’t hesitate to express them through the student-run newspaper, *WPI Newspeak* (Cibulski, 1974 Nov). One complaint the students had was that they constantly felt that they were being pulled in multiple directions and didn’t know what to do or whom to please. They described it as having three choices: please the sponsor, please the advisors (their graders), and please themselves (Cibulski, 1974 Nov). This complaint is humorous because students today still have that same exact complaint (S. Jiusto, J. Hanlan, personal communication, September 27, 2017). Unfortunately, that issue is a core element to the IQP and working in the real world. Below is a quote from the Dean of Undergraduate Studies at WPI, Arthur Heinricher, where he summarizes the IQP experience for WPI students.

“[Students] have to work on real problems, that are unstructured, that are messy, that require teamwork and the IQP is quite often the first place that students really get exposed to that”

- Arthur Heinricher, WPI Dean of Undergraduate Studies

In school, courses go over set topics and there is almost always a right answer, but the real world is not like that. As Dean Heinricher says, it’s “messy” and “unstructured”. In conducting the background for this report, a similar problem was faced where important information relating to the Washington, D.C. Project Center, such as past project reports, summaries, and media do not exist in one place. They are scattered around and held by WPI faculty, alumni, and the library who all had to be contacted. In the next section the methods of record keeping from 1974 to today are examined and the method by which WPI and the WPC chose to store their documents is evaluated.

WPC Record Keeping

Since the late 1990s, Worcester Polytechnic Institute (WPI) has kept online records of student project reports and information from the Washington, D.C. Project Center (WPC) through the WPI eProjects and Banner databases. These databases store project titles, reports, advisor names and sponsor information. Records of the WPC before this time period were kept through inconsistent platforms and mediums. For many of these student project reports, their locations are unknown or non-existent. The differences in record keeping between the start of the project center to the late 1990s and into the present day are largely the result of the available technology.

From 1974 to 1988, students used electronic typewriters to type their project reports (S. Vernon-Gerstenfeld, personal communication, September 29, 2017). A physical copy of the project report would be turned into WPI's George C. Gordon Library when completed. Work study students would manually photocopy project reports to create copies (R. Vaz, personal communication, October 3, 2017). The library would store physical copies for five years. Afterwards, the reports were returned to their corresponding advisors. The library and advisors rarely held onto student reports long term, due to the lack of physical space required for storage. Creating copies of project reports was a tedious process. Copies could be created by either photocopying, at a financial cost, or re-typing each individual report. Lack of copies has led to a majority of these projects' locations being unknown or non-existent.

Some of the only documented information on the project center during this time period is available through WPI's student run newspaper, formerly known as *WPI Newspeak* or *Tech News*. *Newspeak* made its debut in 1973, shortly before the WPC opened in 1974. The name was changed in an effort by the newspaper association for a stronger focus on student's perspectives. An article from *Newspeak* in 1974, begins "Note: Starting with this issue, 'News from Washington', will be a regular column in *Newspeak*. It will provide news, views and commentary on WPI's satellite campus in Washington, written by the students in residence there" (Cibulski, 1974 Oct). The article notes that the WPC began "its first term of operation on September 3 with 15 students involved in six separate projects under the direction of Dr. Frank Lutz. Professor Jim Demetry is the faculty advisor in residence for term A74" (Cibulski, 1974). The rest of article describes the projects and names the sponsors. Articles, such as this one have inexplicably served to document the WPC. These articles are now available in PDF formats through WPI's Digital Commons, an online database of historic WPI documents.

The portable computer was introduced in 1989; from this point forward students would use a combination of electronic typewriters and portable computers (S. Vernon-Gerstenfeld, personal communication, September 29, 2017). Word processors, software for storing, writing and formatting text, were also introduced into the market. They made it simpler for students to type and edit their papers (S. Vernon-Gerstenfeld, personal communication, September 29, 2017). Despite floppy disks, data storage disks getting smaller and capable of storing more information storing data electronically still remained relatively expensive (Shea, 1983).

In the '80s, WPI began to publish *Interactions*, a catalogue of completed IQP and MQP projects per academic year. *Interactions* grouped IQPs in two categories; international and domestic. International IQPs were organized by region, while domestic projects were sorted by theme instead of location. The catalogue only included project titles, student authors, advisor names and project abstracts. *Interactions*

would continue to be published through the 1990s. They are only available as physical copies at the WPI Archives.

In the late 1990s, WPI introduced the WPI eProjects system. This is an online database that houses IQP and MQP student reports (“WPI eProjects”, 2004). Students now had the option to submit their project reports online, however online submissions were not made mandatory until after 2004. WPI eProjects would make project reports available online as PDFs. Within each project report, the student author(s), advisor(s), and sponsor information is available. While WPI eProjects only stores project reports, Banner, a college web service, also allows students, faculty and staff access to personal, academic and financial data. Records retrieved from BannerWeb indicate that students first began registering for the WPC through this system in 1996. The database stores year of project completion, advisor name, student major, project title, project abstract, eProjects ID, and sponsor name. This database was made available by Carla Mararian, an administrative member in the Office of the Provost at WPI. Though the database was extracted from official school records on Banner, there are inconsistencies and missing information throughout the different fields.

WPI eProjects, Banner and *Interactions* cumulatively provide partial records of the WPC from the 1980s to present. Because there was no set procedure for record keeping in the early years of the project center, a majority of these project reports and information exist through a variety of scattered sources.

Defining Impact

In order to analyze impact, the first step was to define or create a model that represents the effects WPI projects have on students, sponsors, communities, and the system at-large. To accomplish this, the model that S. Jiusto and R. Vaz created in their *Understanding Impacts* paper and the results of The Project's Impact Initiative Committee Report by Dominic Golding, Scott Jiusto, Steve McCauley, Anne Ogilvie, and Kent Rissmiller were used as background. A similar model presented by Stoecker et al. (2010) shows that, over time, the scope of the impacts broadens. These models are used to create a new impact model which was used to guide the methodology of this report.

Impact Models at WPI

Jiusto & Vaz: *Understanding Impacts*

The available models authored by WPI Faculty include *Understanding Impacts*, written by S. Jiusto and R. Vaz, and the Project's Impact Initiative Committee Report by Dominic Golding, Scott Jiusto, Steve McCauley, Anne Ogilvie, and Kent Rissmiller. WPI faculty created both of these conceptual models and they are shown below (Figure 2.1, 2.2).

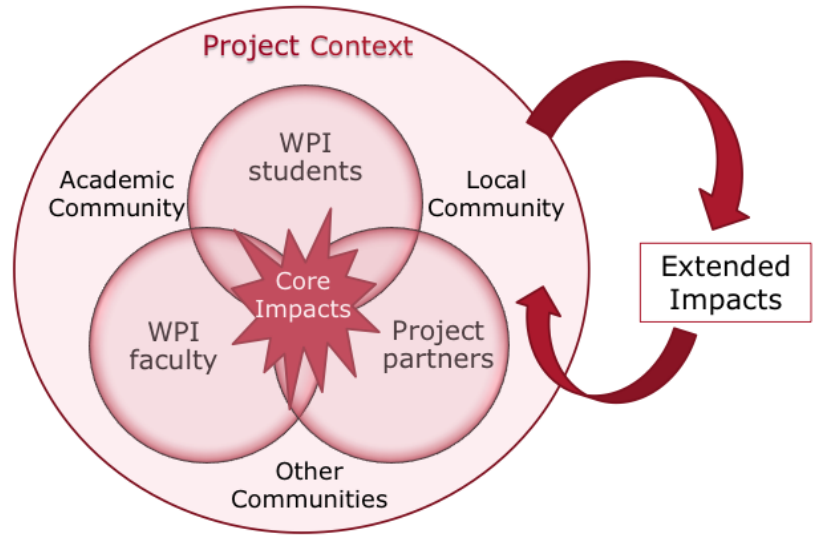
Jiusto and Vaz discussed impact in four sections: Systemic, Community, Organizational, and Individual, which is in descending order in respect to magnitude of impact. Their model displays examples of community actors and potential impacts for those actors. This is summarized below (Table 2.1).

Type of Impact	Community Actors	Potential Impacts
System-Level	Academia Social Movements Policies Health	A new way of learning at an advanced level Alternate social media innovation Policies that affect national (gun laws) New healthcare policies
Community	WPI Community Children School	Support network for students Innovative children’s technology New style of education
Organizational	Departments within WPI Business Cultural	Innovative methods of teaching units Unique ways of appealing to the buyers Ways of spreading culture
Individual	Students Co-researchers Family	Personal growth, experience, planning Developments in research Support mechanism for student/faculty

Table 2.1: A Model of Potential Community Engagement Impacts Summarized (Jiusto, Vaz, 2016)

The Project Impacts Committee Report

The Project's Impacts Committee Report by Dominic Golding, Scott Jiusto, Steve McCauley, Anne Ogilvie, and Kent Rissmiller (2016), incorporates similar ideas. They focus on the impact of the IQP on WPI students, faculty, and community, along with extended impacts. They provided recommendations to WPI on “collection, analysis, reporting and administration” (p. 17). Shown below (Figure 2.2), is the graphic used to show the relationship between the different stakeholders involved and how their impacts are not always one-directional, but that they can impact each other. This model is more focused on WPI project work while the Jiusto and Vaz model is more generalized.



Worcester Polytechnic Institute

Figure 2.2: Essential Relationships and Project Context (Golding et al., 2016)

Other Models

Models similar to Jiusto & Vaz are difficult to find as there are few published models describing impacts (S. Jiusto, personal communication, September 2017). There were no other models found that directly apply to student project work and project-based learning. However, there are sources like Stoecker et al. (2010), cited in Jiusto and Vaz (2016), where popular methods of analyzing impact and different kinds of impact are discussed. Stoecker claims that many impact analysis studies fail to make the distinction between outcomes and outputs of projects. Outputs are defined as the deliverables of a project. Outcomes are more difficult to quantify and can be broadly defined as the impacts of the project. The example given to help explain the difference between the two is as follows. A team is tasked with creating a database of homeless people who need shelter. The output of this project would be the database of homeless people. The outcome would be how the problem of homelessness was addressed in the community as a result of this database. The latter is obviously much harder to determine. Stoecker et al. divide impact into 4 groups: System, Community, Organization Partnership, and Individual Relationship. Seen below (Figure 2.3) is Stoecker's basic model showing that, as time increases, the impacts broaden.

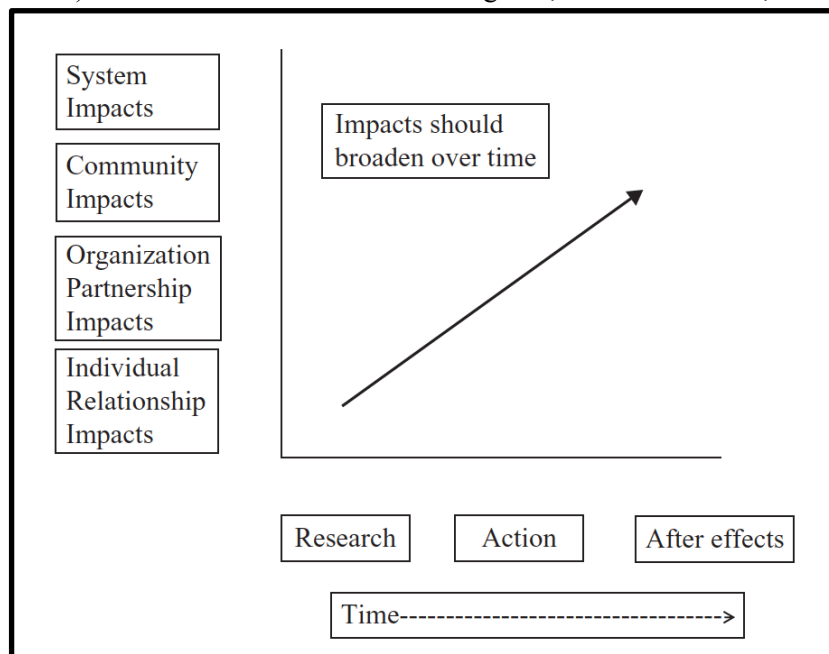


Figure 2.3: Impacts Model (Stoecker et al., 2010)

Identifying outputs and outcomes of a project were important for this report and were taken into consideration when interviewing as well as surveying sponsors and alumni about projects with which they were involved.

The Impact Model

Key Considerations

Impacts is a broad and complex term. To define the term, two key considerations were taken into account: purpose and interpretation. The purpose of an impacts model is to serve as a guide to understand the effects WPI projects have on students, sponsors, communities, and the system at-large. It should not be used solely as a marketing tool because then small or negative effects would be suppressed. For example, the focus would become large, newsworthy and positive projects. Part of this structure is to show that impacts can be both positive and negative. This further enforces this model as a resource and not a marketing tool. Because groups of different sizes can be affected, it is important that the model not imply that the size of any change is directly correlated with the importance of that change. Impacts are usually thought of as a one-sided relationship, but as shown in Golding et al. (2016), impacts generally are two-sided. With these considerations in mind, a model specific to the WPI project work was created, which was used for the WPC and can be adopted in the study of other project centers.

Displaying the Model

The WPC Model (Appendix A) is a visual guide showing the effects WPI projects have on students, sponsors, communities, and the system at-large across multiple groups. A visual model is best suited for this report, because it simplifies a broad and complex term into an easy to understand model. Similar to the models discussed in previous sections, the groups are categorized by size and organized in increasing order. The methodology discusses the creation of the model in depth.

Learning From Other Project Centers

Though the Washington Project Center was the first off-campus project center at WPI, it is not the first project center to begin detailed documentation of the projects completed by its alumni and the impacts of their work. The London and Melbourne Project Centers (LPC and MPC respectively) have had IQP teams' complete similar projects in the past. These project centers have created a framework for project center website design and documenting and analyzing impacts. The following sections analyze how the London and Melbourne Project Center have successfully approached and completed these projects. These sections also look at areas of improvement or modification in their investigations of impact. Because each project center has a different history and impact, analysis focuses on methods that are applicable to the effort of documenting and analyzing the WPC.

Project Center Websites

WPI has over 45 project centers domestically and abroad. Each project center has a page on the Global Projects Portal (GPP), a website that hosts information about the application process, important deadlines, project center locations and culture, program dates, housing and meals, project opportunities, cost and billing, health and safety, and additional resources ("Global Portal", n.d.). In the additional resources provided by the Global Project Portal are links to the project center's designated website. These project center websites provide additional information and material that cannot be found on the Global

Projects Portal (GPP). Currently only twelve project centers have websites. These websites follow a predetermined template made in WordPress, an online website builder. Project center websites are generally meant to encourage prospective students, faculty and sponsors to attend or work with the project center and to document past projects. Project center websites are required to have a Home page, WPI program page, Projects page and Contact Page (Appendix B). The Home page includes a picture of the project center and a short description of the history of the center, such as the opening date of the center, number of students who have attended, number of projects completed and types of projects completed. Under the WPI Program page can be found descriptions and facts and figures about WPI and the IQP. The Projects page documents projects completed at the center grouped by year completed. The information available on these projects can vary per project center. Typically, they all include the project title, student author names and links to the project reports. The Contact Us page has the contact information for center director. This is made available for students, sponsors and the general public seeking more information. Project Centers are allowed to customize the content featured on their websites, while the general structure is standardized. The following subsections will look at the additional content that two different project center websites have chosen to include.

London Project Center (LPC)

The London Project Center website includes an additional page entitled “For Students” (“London Project Center”, 1995). This page includes links to testimonials from WPI alumni who completed their IQPs at the LPC. The alumni testimonials include the alumni's name, picture, major, year of graduation, a life post-graduation description and responses to questions related to their experiences at the LPC. These testimonials are beneficial to students, because they come from the perspectives of students who have gone through experience of an off-campus IQP. Additionally, they are examples of students who have been long impacted by their experiences at the project center.

Melbourne Project Center (MPC)

The Melbourne Project Center website differs from traditional project center websites, because of the additional features and content (“Melbourne Project Center, 1995). The MPC, similar to the LPC, includes a “For Students” page. Unlike the LPC, this page has a promotional video targeted at students. The video includes testimonials from students about their experiences and testimonials from the perspectives of sponsors and advisors about the students’ experiences and work. Prospective students can also learn about the culture, attractions and housing of the project center on this page. The MPC team also embedded a student-related impact analysis on the page, such as a graphic of student reported impacts on professional skills, personal skills, and experiences and a section for student statements.

Similar to the students’ page, the MPC has included a “For Sponsors” page. This page focuses on explaining the IQP and providing guidelines and expectations for sponsors. A sponsor video is also included, which aims to encourage potential organizations to host an IQP, utilizing the testimonials of other sponsors.

Like most other project center websites, the MPC organizes projects completed at the center by year. Unlike other project center websites, projects are also organized by sponsor and theme. Projects are organized by year completed. Projects are further categorized by term as the MPC has multiple IQP terms

available each year. Projects organized by theme are categorized by general similarities such as Education, Healthcare, and Public Safety (Figure 2.4).

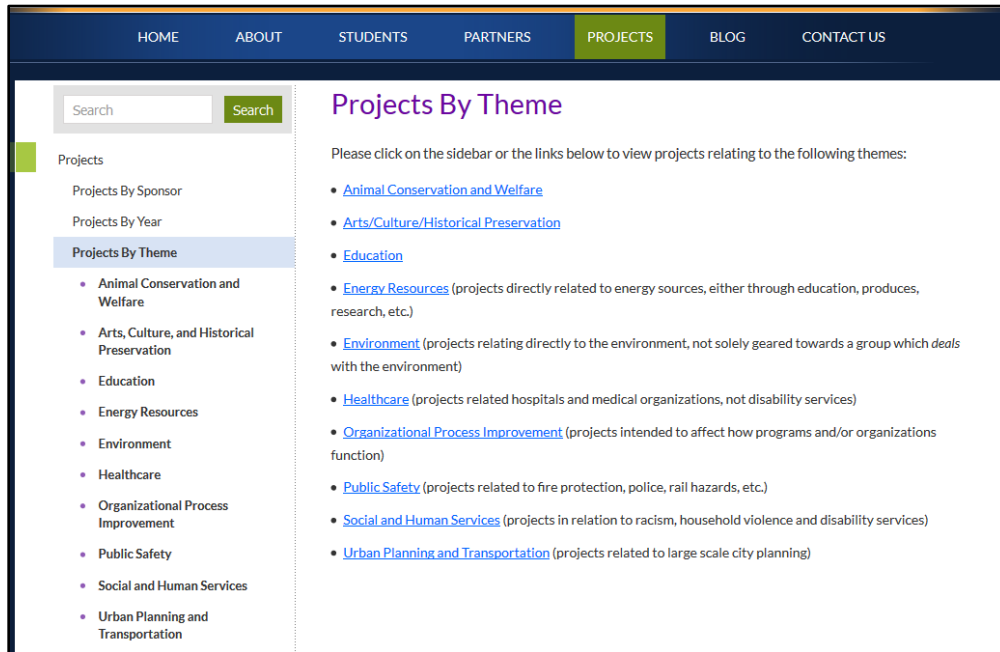


Figure 2.4: Projects organized by theme on MPC website

Though integrated into the website, the MPC website's "Blog" page is not actively used. Those with access can theoretically post updates of the project center in real time. These posts can include updates on the start of projects, memorable mentions, and student life on-site (Figure 2.5). This is an example of project centers beginning to use outreach methods through the media.

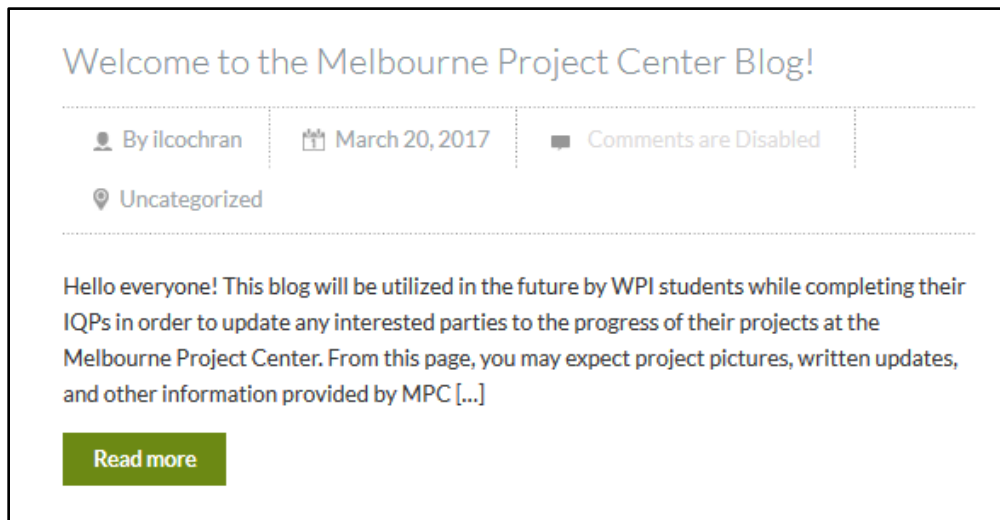


Figure 2.5: Example Blog Post from MPC Website

Similar IQP Projects

Both the London and Melbourne Project Centers have created methods to assess the impacts of IQP projects on individual, organizational, community and systemic levels for their respective project centers. The London and Melbourne Project Centers each had IQP teams complete these projects in 2016. The Melbourne Project Center in 2017 had a second IQP team follow up on the work of the first MPC team. The following sections focus on how these teams analyzed the impacts of different groups and their project deliverables.

London Project Center Impacts Team

The London Project Center (LPC) sponsored a team of IQP students to document the history and impacts of the London Project Center in 2016 (Briggs, Getz, McGlame & Padberg, 2016). The team was able to devise unique methods and deliverables in their work. To analyze the impacts of these projects, the team created and analyzed alumni surveys. To document the history and evolution of the project center, the team developed a timeline of key events and the projects completed by year.

Project Center Timeline

The LPC team developed a project center timeline of projects and important events from the opening of the LPC in 1987 to 2016 (Figure 2.6). When available, for each year on the timeline the titles of the projects completed during that year are listed. The timeline is color coded by center director to visually show the change over time. This timeline was created using Prezi, an online software that allows users to create interactive presentations. The software is specifically designed for presentations, similar to PowerPoint. The team was able to create an interactive timeline using the software. Though the presentation is visually appealing, there are a few inconveniences to using Prezi. Because the timeline covers 28 years of history, it is difficult to view the entire timeline all at once. To navigate the timeline, the user has to click through each single year or click in a general area and zoom in. There is no way to easily skip through years. While the timeline notes key milestones and events of the LPC, there is no information on the historical and social context of the project center. Additionally, to update the timeline, the user needs access to the account used to create it. Providing a manual with instructions on updating the timeline and guidance on content would have proven to be beneficial to other LPC teams in the future and other IQP teams wanting to create something similar for their project center.

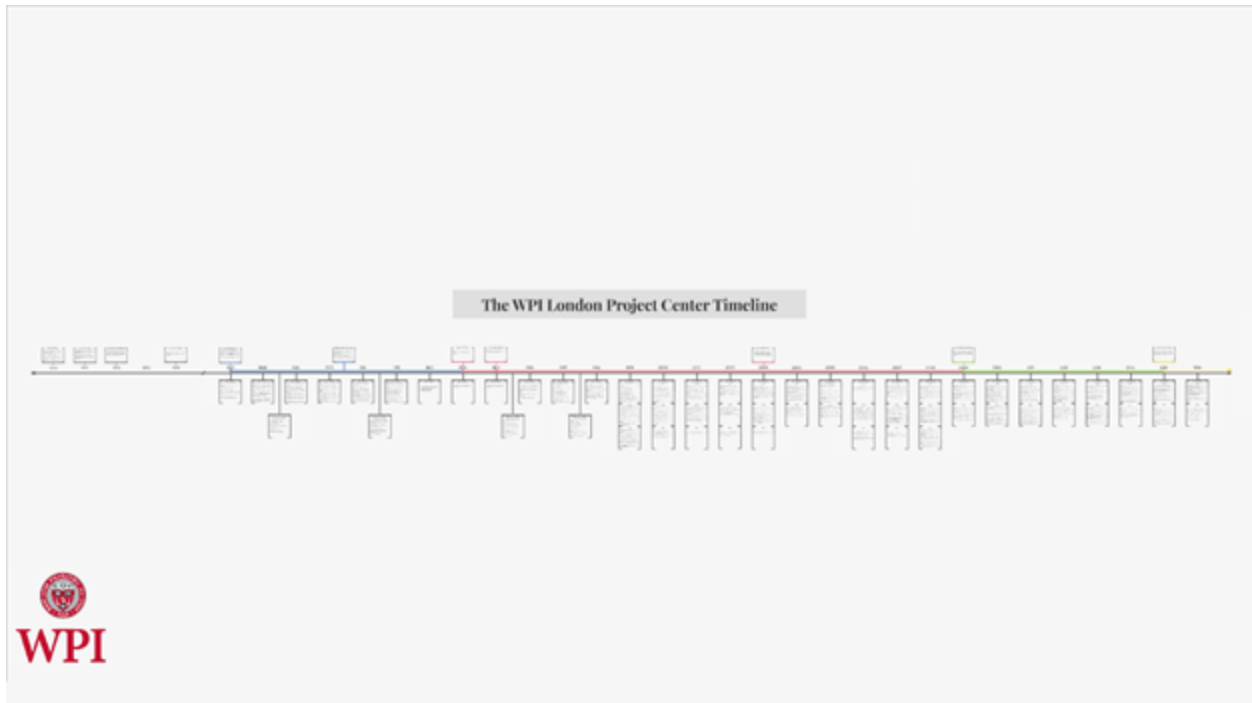


Figure 2.6: LPC Timeline

Alumni Survey

The LPC team developed an alumni survey to assess the personal and professional impacts of the project center on alumni and the impacts of their work on the sponsoring organization and broader community (Appendix C). The alumni survey was sent out during the on-site time period of the IQP and remained open for two weeks. In order to encourage participation, the IQP team offered alumni who completed the survey a chance to enter in a raffle to win an Amazon Gift Card. The survey used a Likert scale (a measurement device used to gauge attitudes, values and opinions), multiple choice and open answer questions. These various types of questions were used to best gather data strategically. Questions related to anecdotes or opinions were asked as open ended questions. Questions that asked about impacts in regards to professional and personal skills were asked using a Likert scale. Questions related to the type of agency or type of project worked on were asked using multiple choice questions.

Melbourne Project Center Impacts Team One

The Melbourne Project Center has had two teams, 2016 and 2017, which looked at the history and impacts of the Melbourne Project Center. Some of the foci of the first team were: impact groups, sponsor map, and a timeline.

Defining and Analyzing Impacts

The Melbourne Project Center approached impacts by deconstructing the term into three categories: students, sponsors, and communities. Impacts in itself covers a wider range of individuals and groups, from a personal to systemic level. By choosing to focus on three impact groups, the MPC team

was able to evaluate the groups more thoroughly and effectively. The MPC created a table to organize the groups, their expected impacts and any existing tools they used to analyze those impacts (Figure 2.7).

	Expected Impacts	Existing Tools
Students	<ul style="list-style-type: none"> Improvements in the academic learning outcomes established for the IQP 	<ul style="list-style-type: none"> Student Report on IQP Learning and Advising Biennial Review of IQP Reports ID 2050 / PQP Grading
	<ul style="list-style-type: none"> Effect on their professional skills 	<ul style="list-style-type: none"> 2014 Alumni Survey (Vaz & Quinn) Self / team evaluations
	<ul style="list-style-type: none"> Personal growth 	<ul style="list-style-type: none"> 2014 Alumni Survey (Vaz & Quinn) Post-project reflective activities
	<ul style="list-style-type: none"> Expanded worldviews and cultural competency 	<ul style="list-style-type: none"> 2014 Alumni Survey (Vaz & Quinn) Post-project reflective activities
Sponsors	<ul style="list-style-type: none"> Production of useful deliverables 	<ul style="list-style-type: none"> IGSD sponsor survey administered upon project completion
	<ul style="list-style-type: none"> Changes in programs and procedures 	<ul style="list-style-type: none"> Informal feedback from students, sponsors, advisors
	<ul style="list-style-type: none"> Increases in funding 	<ul style="list-style-type: none"> Informal feedback from students, sponsors, advisors
	<ul style="list-style-type: none"> Training or re-energizing staff 	<ul style="list-style-type: none"> Informal feedback from students, sponsors, advisors
	<ul style="list-style-type: none"> Catalyzation of new relationships 	<ul style="list-style-type: none"> Informal feedback from students, sponsors, advisors
Communities	<ul style="list-style-type: none"> Systemic changes 	<ul style="list-style-type: none"> Identified by center directors and advisors anecdotally through continued engagement
	<ul style="list-style-type: none"> Production of physical resources 	<ul style="list-style-type: none"> Project reports IGSD sponsor survey administered upon project completion
	<ul style="list-style-type: none"> Promotion of community awareness, participation, agency 	<ul style="list-style-type: none"> Informal communication with community members

Figure 2.7: MPC Details on Each Impact Group

This chart also provides guidance into what aspects of project experiences to research. By assigning each group’s anticipated impacts, the analysis process is systemized and organized.

Promotional Materials

Apart from analyzing impacts, the MPC team created a variety of promotional materials. The materials target a wide audience: prospective students, sponsors, and advisors. The MPC team developed a logo for the project center, list of historical events and milestones, database of testimonials, sponsor map, timeline, project center infographic and recruitment brochure. The following analysis focuses on the sponsor map and timeline.

The MPC is the only project center to have created a sponsor map (Figure 2.8). The sponsor map shows the location of the sponsoring organization with a numbered circle. Each number corresponds to a sponsor in the legend. It is not clear whether the sponsors listed are all current sponsors or a mix of current and past sponsors. The map is useful in providing a visual of the distributions of locations where students complete their projects in Melbourne. According to the MPC team, the sponsor map encourages networking between sponsors who are unaware of other organizations involved with the MPC (Callahan, Filippou, Henson, & Zuccolo, 2016).



Figure 2.8: MPC Sponsor Map

The MPC produced a timeline that ranges from the opening of the project center in 1988 to 2017 (Figure 2.9). The timeline only highlights key moments in the history of the project center, unlike the LPC timeline (Figure 2.6). Key events include the project center’s first year, changes in directors, and mentions of the MPC in the media. The timeline also shows organizations which partnered with the project center for a significant number of years. The timeline denotes the years they sponsored with a solid line, and years they did not sponsor with a dotted line. This distinction shows how some sponsors continuously work with the project center while others might not.

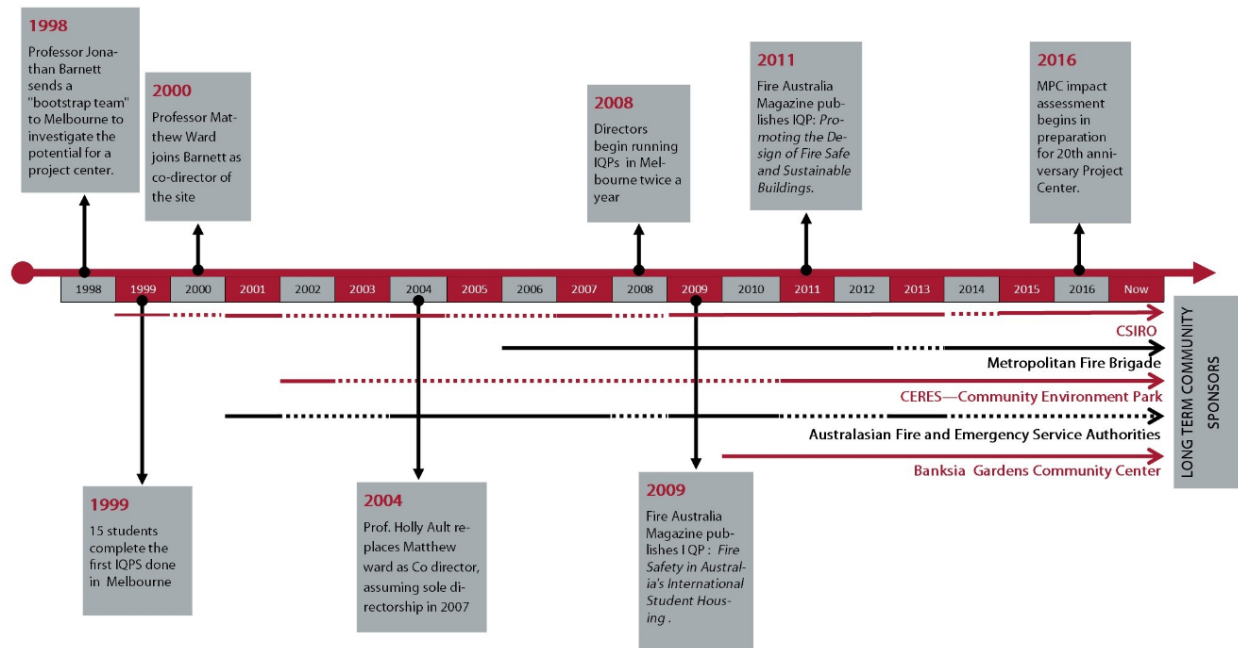


Figure 2.9: MPC Historical Timeline

Coding Category Definitions

The MPC developed different methods to code sponsor types, project themes and deliverables. These codes could then be used in a statistical analysis of the data gathered during interviews and surveys. Sponsors were coded into the three categories: non-profit/non-governmental organization, private enterprise and government (Table 2.2).

Sponsor Type Coded Category	Code	Definition
Non-Profit Organization/ Non-Governmental Organization	N	Charitable groups, community organizations promoting social causes, museums, schools
Private Enterprise	P	Profit-making businesses and industries
Government	G	Government run agencies, offices, and services (police, fire)

Table 2.2: Sponsor Type Coded Categories

Many different types of projects have been offered at the MPC. To analyze all of these projects, the team developed coded themes. The themes serve to describe the type of project (Table 2.3).

Theme Coded Category	Code	Definition
Education	ED	
Environment	ENV	Not all sustainability is ENV, there are types of sustainability other than environmental. Project must deal with the environment, and not just be geared towards another group who deals with the environment.
Energy Resources	ER	Needs to deal with energy resources directly, either through education, products, research, etc. Sustainability relating to energy resources falls under ER not ENV.
Healthcare	H	Hospitals and medical, not disability services.
Social and Human Services	SOC	Racism, household violence, disability services.
Arts/Culture/Historical Preservation	ACH	
Animal Conservation and Welfare	AN	
Organizational Process Improvement	OPI	Large section of organization or department. Affecting how programs or how the company functions.
Urban Planning and Transportation Infrastructure	UT	This is for large scale city planning only, not small household planning. Actual design is not required to under UT.
Policy and Law	POL	
Public Safety	PS	Fire related projects, police, rail hazards, etc.

Table 2.3: Coded Theme Categories

By coding the project theme, it became much easier for the Melbourne team to take a statistical look at what kinds of projects were completed at the MPC. Information like what project themes are prevalent at the MPC and popular project themes offered by each sponsor became much easier to evaluate. Also, because a project can be coded under multiple themes, it was simpler to summarize more complex IQP projects.

The MPC team also coded the types of deliverables that could be produced by projects. Similar to themes, a project could be coded under more than one type of deliverable (Table 2.4).

Deliverable Type Coded Category	Code	Definition
Training or Educational Materials	TR	Curriculum, activities, workshops, videos, modules, instructions, handouts, etc.
Promotional Materials and Events	PRO	Promo strategies, ads, brochures, posters, commercials, fliers.
New Procedures and Processes	NP	Implemented not just recommended.
Information Repositories, Databases, Websites	DB	Including website design and editing.
Computer Programs or Apps	COM	
Built Structure or Products	BLD	
Designs for Built Structure or Products	DES	Including floor plans.
New Collaborations and Partnerships	PAR	
Research Study and Recommendations	RSR	Large, detailed analysis, not standard background research.

Table 2.4: Coded Deliverable Type Categories

Using coded sponsor types, project themes, and deliverables makes surveying more effective as the raw data can be easily categorized in accordance with these codes. As a result, the frequency of types of sponsors, projects and deliverables can be measured. These coded categories could be related to impacts and students' experiences to find new relationships. Overall, coded categories makes surveying and analyzing data more efficient and systematic.

Alumni Surveys

One method the MPC used to assess project impacts on MPC Alumni was through a survey (Appendix D). The alumni survey was created using Qualtrics, an online survey software commonly used by WPI. The alumni survey had a focus on academic learning outcomes, worldview and cultural competency, personal growth and values, and professional skills (Callahan et al., 2016). The survey was made available for two weeks and gift cards were raffled as incentives to encourage participation. The team used Qualtrics and SPSS Statistics, a software for performing statistical analysis, to analyze responses from alumni. The survey collected both quantitative and qualitative data. In order to statistically analyze qualitative data, alumni responses were coded based on themes. For responses that did not show trends, the data was just represented by direct alumni quotes.

Sponsor Interview Script

The MPC developed an interview script for sponsor staff, such as liaisons (Appendix E). The goal of interviewing staff who directly worked with the students was to assess the impacts on their organization and themselves. These interviews were designed to be short, roughly 15 to 20 minutes, to accommodate the large number of staff to interview and inevitable scheduling conflicts. The interviews focused on: production of useful deliverables; changes in programs and procedures; increase in funding; training or re-energizing staff; and the creation of new relationships.

Melbourne Project Center Impacts Team Two

Following the success of the first team's project, the Melbourne Project Center had a second group of IQP students continue their work. The 2017 IQP team of students had a larger focus on promoting and bringing more awareness to the Melbourne Project Center and its impact. Part of this outreach included developing a website user manual, different social media platforms and videos (Carlson, Day, Seely, & Cochran, 2017).

Website User Manual

Nearly 25% of WPI project centers have project center websites in some form. A project center website serves to document the center and provide information for prospective students, faculty and sponsors. Project Center websites follow a general template for consistency among project center websites, but allow for some flexibility and creativity in content. To encourage the creation of project center websites, the MPC team developed a manual that targets the needs of both students and administrators during the process. Administrators handle functions such as accounts, access, moderating social media and editing the general layout and content of the website. Project center websites are in large part created by students. The manual covers how students can gain access to the project center website and how to upload projects and new content.

Chapter 3: Methodology

Mission Statement and Objectives

The ultimate goal of this project was to help the WPI Interdisciplinary and Global Studies Division (IGSD) define and analyze the impact of projects completed by WPI students at the Washington D.C. Project Center (WPC). A database of key information about all past projects was created, while examining the diverse impacts of those projects. Outcomes included a WPC website and recommendations on how to improve the program.

Completed Objectives

1. Created an Impact Model to Guide an Investigation on Impact
 - Identified scholarly considerations in creating an impact model.
 - Created and shared with others a graphic representation of the model.
2. Conducted Interviews to Collect Qualitative Data on the Impact of WPI Projects
 - Interviewed advisors, students, and sponsors that have been involved or are involved in the WPC.
3. Conducted WPC Alumni Survey to collect Quantitative and Qualitative Data on WPC Projects
 - Surveyed students that have attended the WPC on their experiences.
4. Compiled Database of Past Students and Projects at the WPC
 - Compiled information from various sources into an accurate and complete database.
 - Recorded the process in building this database for project centers looking to complete this objective in the future.
5. Created a Website to Document the History and Impact of the WPC.
 - Identified possibilities for website content and purposes.
 - Implemented features of other project center websites that translate well to the WPC.
 - Continually communicated with Dean Rissmiller on the design and the information displayed.

Created an Impact Model to Guide an Investigation on Impact

Goals

The overall goal of the impact model (Figure 3.1) is to serve as a guide for investigations on impact. There were several objectives that helped in the creation of this model:

1. Show what an 'Impact' is and can be;
2. Guide surveys, interviews, and analysis of the two;
3. Take into account key considerations learned from advisors and references.

References

As mentioned in Chapter 2: Background, there exists some definitions of impacts that were used as reference in creating the model (Figure 3.1). Jiusto & Vaz (2016) was a significant reference used during the creation of this model. It can be easily applied directly to WPI project work, and Professor Jiusto was an advisor for this project. The definition by Jiusto & Vaz broke impact down into 4 different levels, the same levels that were used for this model: individual; organization; community; and systemic. The WPI Impact Committee (2016) portrayed impacts as a two-sided relationship. Through background research in WPI projects, this concept often is accurate. WPI students benefit from the project equally if not more so than do their sponsors. Finally, Stoecker et. al. has two main takeaways. The first is that projects can have outcomes and outputs, which is described more fully in Chapter 2: Background. This idea, while not apparent in the model, helped establish the goal of the survey and interviews. In both methods, the outcomes (effects, experiences) and outputs (report, presentation) were investigated. The second takeaway is that impacts broaden over time. It was recognized early on that the organization or community might not be affected until years after a project has been completed.

Creation of the Graphical Representation

Because models of impact are scarce, two other models were used as resources when drafting this model. Using Adobe Illustrator, the model was made to be simple and attractive, to aid readability. Since impact is a broad term, this model might not apply in every situation.

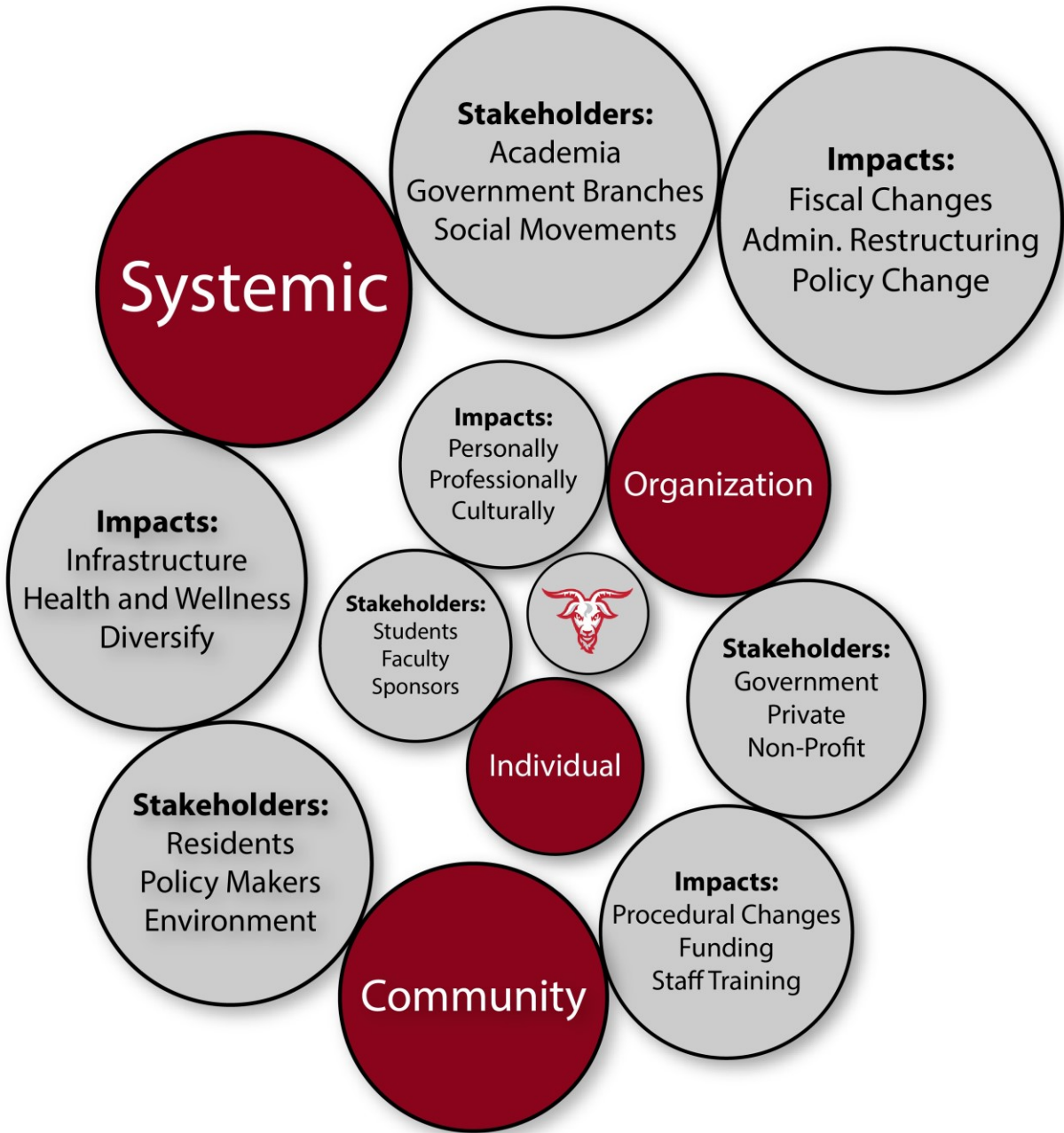


Figure 3.1: Impact Model

Explaining the Intended Usage of the Impact Model

The model (Figure 3.1) is intended to be used to guide investigations on impacts, such as this project studied. Below are some key terms that help in the explanation of the model:

1. Levels: The different categories (Individual, Organizational, Community, and Systemic) of impacts described in the model that vary in how broad they are;
2. Impacts: General effects of a project or similar endeavor that fall under each level;
3. Stakeholders: Individuals or groups that can fall under each level;
4. WPI Projects: The outcome of collaboration among a number of core parties such as students, sponsor, and advisors.

The model starts in the middle and goes outwards clockwise, showing that impacts broaden. The red circles indicate the level of impact. For each level, stakeholders and examples of impacts are given to help the viewer understand what each level contains.

Conducted Interviews to Collect Qualitative Data on the Impact of WPC Projects

Goals

The overall goal of conducting interviews was to collect qualitative data (e.g. quotes, anecdotes, testimonials) to add a new dimension to quantitative data collected through other methods. Because interviews are not time efficient with large pools of people, only advisor and sponsor interviews were conducted. The following sections provide more detail to how these interviews were carried out.

Interview Process

Interviews for the different key informant groups (i.e. advisors, sponsors, students) were conducted following the same general process:

1. Initial Contact: Email the interviewee to request and set up an interview at their convenience and when the interview was set up, it was added to a shared Google Calendar;
2. Reminder: Send out an interview reminder one or two days in advance with the interview script attached;
3. Conduct: Interview is conducted by designated facilitator, notes are taken by the rest of the team, and the interview is audio recorded.

Each interview was conducted using a general script that served as a guide that could be slightly modified to take advantage each interviewee's different background.

Advisors

The main goals of advisor interviews were to learn about the impact of the projects completed at the WPC and understand how the WPC does or does not meet the goals of the WPI Plan. Advisors interviewed were chosen per recommendation of the current advisors and liaisons (Table 3.1 and Table

3.2). Additionally, advisors who were involved with the IQP program and project based learning on a larger scale were selected. All interviews used a general script (Appendix F) to guide the interview, but modifications were made per interviewee depending on their relation to the WPC. For example, Chrysanthe Demetry, who was both a student and advisor at the WPC, was asked questions regarding her experiences from the perspective both of a student and an advisor and reflected on how she had seen the project center change. These interviews began during the prep-term and spilled over until the on-site term.

A majority of advisors and project center directors of the WPC who were interviewed are still faculty members at WPI. These key informants were interviewed during the prep-term to take advantage of the proximity and accessibility (Table 3.1). Interviews were generally conducted in-person and were between 30 to 40 minutes. To accommodate for scheduling conflicts, some interviews were conducted with only one or two group members present versus the entire team.

Name	Relation to WPC	Interview Type
Chrysanthe Demetry	Advised, Alumni of WPC	In Person
David DiBiasio	Center Director (Former), Advised	In Person
Arthur Heinricher	Advised	In Person
Kent Rissmiller	Dean of IGSD (Current), Center Director (Current), Advised	In Person
Lance Schachterle	Advised	In Person
Richard Sisson	Advised	In Person
Richard Vaz	Dean of IGSD (Former), Advised	In Person
Susan Vernon-Gerstenfeld	Center Director (Former), Advised	Phone

Table 3.1: Faculty Interviewed in Worcester, MA

Additional advisors were interviewed, primarily during the first week in Washington (Table 3.2).

Name	Relation to WPC	Interview Type
Allen Hoffman	Advised	Phone
Jack O'Connor	Advised	Phone
James Hanlan	Advisor	In Person

Table 3.2: Faculty Interviewed in Washington, D.C.

Sponsors

The goals of the sponsor interviews were to understand the personal experiences of sponsors, recommendations to improve the WPC experience, and collect examples of students' work having an impact on the sponsor, organization or greater community.

An initial list of contacts was created using the information provided in Kent Rissmiller’s Database. This was supplemented by including sponsor contact information from a set of Project Summary sheets and Project Description documents (Table 3.3).

Document Name	Years	Contact Information
Kent Rissmiller’s Database	1994-95	Name
Project Summary Sheets	1992-93	Name, Phone
Project Description Documents	2012-17	Name, Email and/or Phone Number

Table 3.3: Sponsor Contact Information Sources

A list of 73 sponsors was created, with a majority of each contact having an email (Table 3.4). In the third week of the on-site term, interview request emails were sent out to sponsors (Appendix G). Key informants whose contact information was not listed or was outdated, were contacted through colleagues at the same organization.

No. of Liaisons	Contact Information Available
47	Email
11	Phone
15	Name

Table 3.4: Count of Contact Information Available

A total of 22 individuals were interviewed, with a majority scheduled during the fourth week and the rest during the fifth and sixth week. The interviews were a mix of in-person and phone meetings. A lot of the organizations that the WPC partners with are government agencies that require some form of security clearance or are located further away from the D.C. area. In these instances phone interviews were more convenient. To manage time spent on interviews (including commuting) the team would divide and conquer by sometimes having half the team conduct the interview while the other half worked on other project objectives.

After interviews were scheduled, a meeting reminder would be sent out one or two days in advance, along with the general interview script to the sponsor (Appendix H). By sending the general interview script in advance, sponsors had time to prepare information on projects they had sponsored in past years or any media they would like to share. Most interviews were audio recorded for documentary purposes and as supplementary material to the interview notes.

Students

One alumni, Michael Aghajanian, was interviewed as he had attended the project center during its early years and would serve as a test to see if alumni interviews were something to pursue. The student

interview lasted about 40 minutes and was successful in measuring the impacts of the project center on the student, gathering media and suggestions to improve the IQP process. While successful, there are more than 1,200 alumni and therefore conducting alumni interviews for each of them would not be efficient. More meaningful results could be gained from a survey.

Interview Analysis

Interview data for both faculty and advisors was in the form of open answers documented in meeting notes and interview audio recordings. In order to analyze the data efficiently, questions that targeted the goals of these interviews were selected for analysis. To help with the analysis, both the interview notes and audio recordings were referenced. The notes served as a quick guide to responses, while the audio recording served to extract quotes and clarify notes. A general response was formulated for the selected questions in order to understand the consensus of the group interviewed.

Advisor interviews were used for conducting background research and learning about the impacts of the IQP experience from the perspective of an advisor. Questions 2, 3, 5 and 8 from the advisor interview script targeted these goals (Table 3.5).

#	Question in Interview	Purpose
2	How does the IQP achieve the goal of the WPI Plan?	Background Research: relationship of WPI Plan and (WPC) IQP
3	What do you see as being the greatest impact of the WPI IQP project experience?	Background Research and Impact
5	Were there any particularly impactful projects that stood out amongst the others?	Impact: all levels
8	What are the impacts that advising had on you?	Impact: individual level

Table 3.5: Examples of questions from Advisor Interview Script and designated purpose

Sponsor interviews were used to generate a list of recommendations to improve the WPC experience, but also to understand the types of impact the students' work had. Instead of directly asking the sponsors how they felt about their experience, questions like #6 and #9 were asked to probe deeper into the dynamic between sponsors and students (Table 3.6).

#	Question in Interview	Purpose
3	What were some of the most notable or memorable projects in terms of their outcomes and specific impacts on your organization or on populations or groups that your organization serves?	Impact: all levels
6	How much were students directed by your organization or self-guided?	Sponsor Experience
9	Were there any negative or unintended consequences of past projects?	Sponsor Experience
10	What aspects of the project experience could WPI work on to help improve the quality of future projects?	List of Recommendations
11	What advice would you give to future students wanting to work with your organization? What advice would you give to organizations looking to work with WPI students?	List of Recommendations

Table 3.6: Examples of questions from Sponsor Interview Script and designated purpose

Conducted WPC Alumni Survey to collect Quantitative and Qualitative Data on WPC Projects

Goals of Survey

The information goals of the WPC Alumni survey (Appendix I) are outlined below, i.e. for each WPC alumni, the following information was obtained. The target population was any WPC alumni from 1974 to 2016. WPI has an agreement with Qualtrics, a professional survey service, and that service was used to display the survey. Qualtrics stored all of the survey data on their website. The data was exported to excel for analysis and to fix human errors in the survey answers.

Survey Goals

- Demographic information such as major, gender, and IQP year
- Personal Impacts on themselves
 - Personally
 - Professionally
- Their perceived impacts of their project
 - On their sponsor
 - On any community or group
- Project outputs
 - Deliverables
- Recommendations to WPI on the IQP
 - If they had three aspects of their experience to change
- Media to support the project center website
 - Pictures
 - Quoted Stories

References

In order to minimize the time spent drafting and reviewing the survey, past WPI impacts surveys (Melbourne & London) were looked at for reference (Appendix D, C). The survey results of the other project centers were published with their respective report. Another survey not referenced, but used for inspiration was the Donahue study (2013) performed by WPI. The study focused on the long-term impacts of the project based learning at WPI. The majority of that survey used Likert Scaling, which was incorporated into the survey to quantitatively analyze qualitative concepts. For example, questions involving the degree to which student IQP experience altered their worldviews or benefitted their professional careers couldn't have been easily quantified without such scaling.

Survey Drafting Process

With goals in mind and other surveys as reference, the process of drafting and reviewing the survey with advisors and project liaison lasted for the first 2.5 weeks in Washington. Below are some of the key aspects (Table 3.7) involved in creating this kind of survey. In the final survey there were 48 questions: 17 multiple choice / demographic, 20 Likert scaled, 10 open-response, and 1 asking for pictures.

Aspect of Survey	Reasoning
Introduction Email	This is the email used to introduce the team to the alumni as well as link the survey so it can be filled out by the recipients of this email
Personal message to alumni	A personal message to alumni helps differentiate the project team (a group of students just like them in the past) from just another WPI survey. This message is both in the introduction email (Appendix J) and survey preface.
An engaging subject line of the introduction email	The subject line of the introduction email: "Please share your experience at WPI's Washington Project Center" This further reinforces the idea that students are looking for help with their project instead of another WPI survey
Likert scaling	Allows qualitative questions to be analyzed quantitatively
Feedback	Continuously receiving feedback from advisors, sponsor, & fellow students on the survey questions made reviewing question content much easier

Table 3.7: Key Aspects of the Survey

Alumni Contacts

Several sources were used to compile alumni contact information (Table 3.8) from 1974 to the most recent year (2016).

Source	Description
WPI Alumni Office	<ul style="list-style-type: none"> • They were given a list of student names that was compiled from the database and received emails for each name • An invite list for the WPC 40th anniversary event that had alumni emails • This combined in total to a list of ~800 emails from 1974 - 2016
WPI BannerWeb	<ul style="list-style-type: none"> • Received data export of data on students, a field was a wpi.edu email for each student • This combined in total to a list of ~150 emails from 1997 - 2016

Table 3.8: Sources for WPC Alumni Contact Information

These lists of emails were cross-referenced and culled to a final list of 835 emails. With this final contacts list, the survey could then be distributed.

Sending the Survey

The survey was initially distributed on 11/8/2017 via email to 835 people, however 127 emails failed to be delivered. The introduction email (Appendix J) was framed as a plea for help - containing a picture of the team and a description of the project in order to relate to the alumni. It also had examples of pictures to encourage respondents to reply with pictures of their time in Washington. A reminder was sent on 11/12, 11/18, and 11/21. Another 3 emails failed leaving the valid population to be 705 people. The schedule is shown below in a calendar (Figure 3.2).



Figure 3.2: Survey Distribution Schedule

Analysis

Analysis of the data began in the 5th week (Nov 27th - Dec 1st). First, the responses were characterized in the attendance year, term, gender, and major. Then, all non-open response questions answers were analyzed. For example, there is a set of Likert scaling questions asking if the students agree that “My IQP experience enhanced my abilities in...” areas like teamwork and leadership. This individual

question was analyzed by looking at what percentage of students somewhat agree or strongly agree with the prompt. Similarly, the responses for the first 10 years and last 10 years of students can be compared. The findings chapter presents the results of the alumni survey.

Compiled Database of Past Students and Projects at the WPC

Goal

The goal of this database was to have a record of past students who attended the Washington Project Center, and any pertinent information relating to them or their project.

Process

One of the primary deliverables of this project is the database of past attendees of the project center. As the center's 45th active year is approaching, there is a significant amount of data that exists. Unfortunately, of the data that exists, only the past 20 years is in electronic format, everything else is in paper format. This report's new database greatly simplifies everything for both program directors and future students. In addition to this, while WPI held onto physical documents after the projects were completed, they only did so for 6 years, as space in the archives is limited. Table 3.9 shows the different sources of information used.

In Worcester, physical records relating to the project center were identified in the archives and were scanned by archive staff to PDF format. The electronic format made all the documents accessible while in D.C. The project summary sheets from 1974 - 1993 were among these documents and had information that supported the database. Rather than transcribe each document into the database, the program "PDF-to-Word-Free" was used to quicken the process. While not a perfect solution, some data had to be reformatted, this still proved to be faster than entering the data by hand. The rest of the information came from three sources. The first was a smaller database assembled by Dean Rissmiller, henceforth referred to as the KJR database. This contains information pertaining to students at the project center between 1974 and 2004. The second was information on WPC participants from 1999 to 2016, this is referred to as the BannerWeb database. Finally, a booklet of project summary sheets was obtained from Dean Rissmiller; this contained information from 1974 to 1993. Complicating matters was the fact that, in numerous cases, sponsoring organizations were not named consistently. Just one example would be the U.S. Coast Guard. It has been referred to as: The United States Coast Guard, the Coast Guard, the USCG, and the U.S. Coast Guard.

Key Data	Location(s)
Alumni Name	KJR and BannerWeb Database
Graduating Major	Project Summary Sheets and BannerWeb Database
Sponsoring Organization	Project Summary Sheets and eProjects
eProjects #	eProjects database (Only post 2000 projects)
Project Title and Abstract	Project Summary Sheets and eProjects
Graduating Year	KJR and BannerWeb Database
Faculty Advisors	Project Summary Sheets and eProjects
Type of Organization	Organization Website
Theme	WPI eProjects
Deliverables	Project Summary Sheets and eProjects

Table 3.9: Database Information and its Location

Created a Website to Document the History and Impact of the WPC

A website was created to showcase the WPC, because it's an effective and clear method of displaying information from: the database, the alumni survey, the sponsor interviews, WPI Archives, eProjects, Gordon Library website, and from photos taken in D.C. The majority of the background information was found during the prep term ID 2050 course because there was more access to information sources - faculty interviews, WPI Archives, and information from Carla Mararian and Dean Rissmiller. The alumni survey and sponsor interviews were conducted and analyzed in D.C. A more in-depth look into the information presented in the website is displayed below (Table 3.10).

In order to create and edit the WPC website, administrative access had to be obtained by coordinating with The Division of Marketing Communications at WPI. This division also provided the template for the website which was used to create other WPI project centers websites such as Cape Town, Melbourne, and London. The focus at first was getting the general layout of the website set, with the tabs and what information should be displayed on the website. The website developed as more ideas were brainstormed to incorporate information from surveys and interviews. A flowchart of the website is shown below (Figure 3.3).

To make the website fun and attractive, a Flickr account was created and linked to the bottom of the homepage of the website through an added widget. This account contains a collection of photos taken while exploring D.C. This widget is connected to the Flickr account, automatically updates, and displays the 10 most recent photos. If a user clicks on any of the photos displayed, they will be redirected to the Flickr slideshow page, where they can view all the pictures. This includes more photos of the city, not all

displayed on the website, which allows the users to explore more of what a cosmopolitan environment such as that of D.C. has to offer.

A timeline widget was also implemented to make the website more creative and interactive. In order to use this add-in widget, “Cool Timeline”, permission of WPI’s IT Department had to be obtained. The IT Department recommended widgets that are actively maintained, had a large installation base, and had been tested and work in a multisite environment. After sending the potential widget to the IT Department, it was tested and then installed over the course of several weeks. After installation, photos and anecdotes were integrated into the timeline with a description and acknowledgement to the alumni who submitted that media. These pictures and anecdotes were obtained almost entirely through the alumni survey.

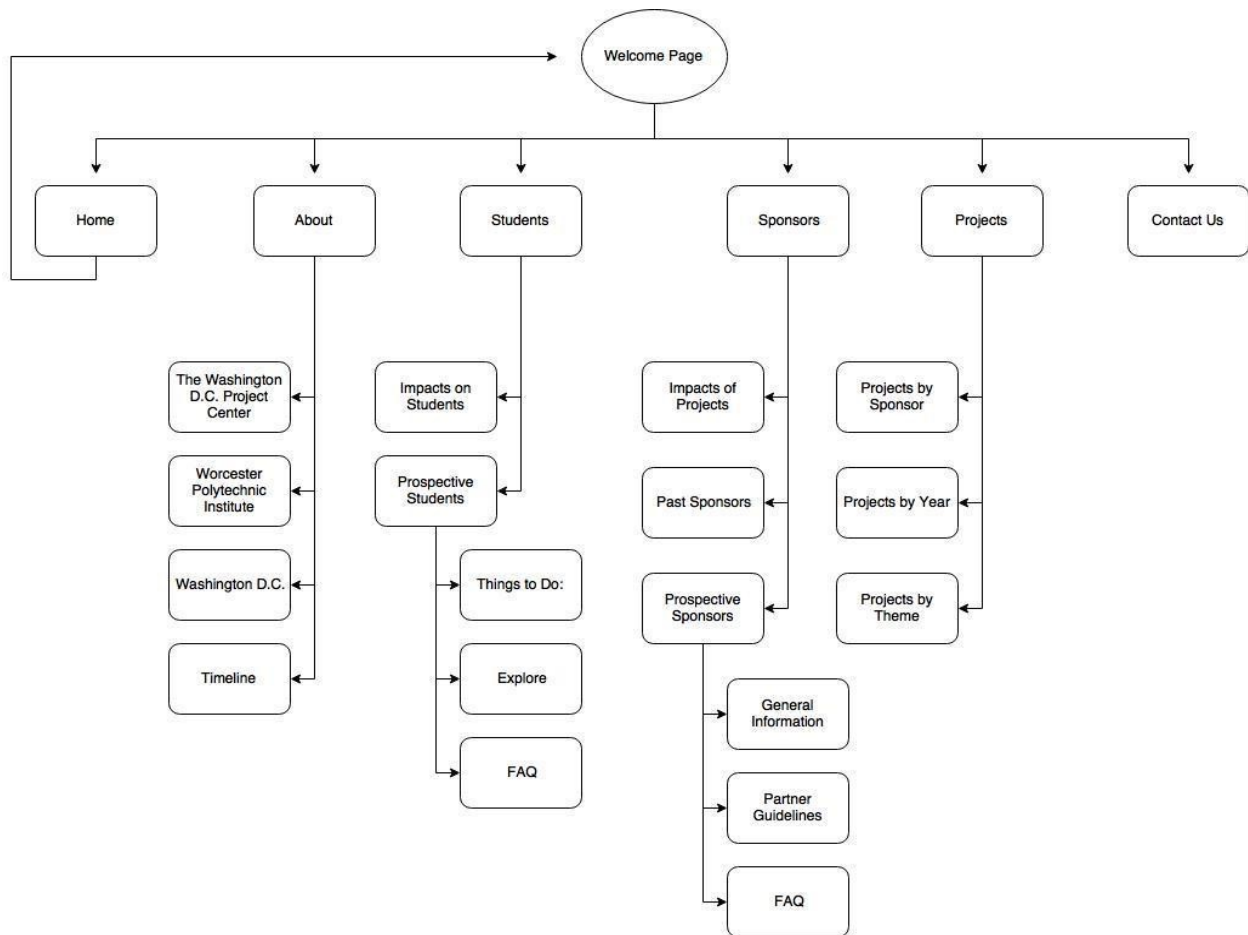


Figure 3.3: Flowchart of Website

Main Page	Page Content
About	<ul style="list-style-type: none"> ● About: general information on WPI ● The Washington, D.C. Project Center <ul style="list-style-type: none"> ○ History and Goals: history of establishment, statistics over the 43 year history ○ Process and Timeline: overview of IQP process and timeline ● Worcester Polytechnic Institute: general overview of WPI supplemented by WPI Admission video and pictures linked to WPI Instagram ● Washington D.C.: overview of the history of Washington, D.C. with respect to time period the WPC was being established ● Timeline: displays pictures and anecdotes submitted by WPC alumni
Students	<ul style="list-style-type: none"> ● Students: general information on types of projects students are working on and information on activities outside of the project ● Impacts on Students: displays survey results ● Prospective Students <ul style="list-style-type: none"> ○ Prospective Students: directs users to check out following pages for desired information ○ Things to Do: Link to washington.org, example attractions ○ Explore: experiences groups had with sponsors ○ FAQ: list of frequently asked questions and answers
Sponsors	<ul style="list-style-type: none"> ● Sponsors: advertises WPI student groups and displays some sponsor logos ● Impacts on Sponsors: information gathered through sponsor interviews ● Past Sponsors: list of organizations and number of years they've partnered with WPI ● Prospective Sponsors <ul style="list-style-type: none"> ○ General Information: sponsoring a project and how to get in contact ○ Partner Guidelines: information on focus points of sponsoring a WPI IQP team (project scope, supervision, and workspace) ○ FAQ: list of frequently asked questions and answers
Projects	<ul style="list-style-type: none"> ● Projects: general information on type of projects and sponsors and some example projects ● Projects by Sponsor: list of sponsors with titles of projects linked to their project pages ● Projects by Year: projects sorted by year (2008-2017 currently available), when a year is selected the user is directed to a page displaying timeline of project, advisors, sponsors, and project titles linked to their project pages ● Projects by Theme: themes derived from survey and project titles linked to their project pages

Table 3.10: Table of Website Information

Chapter 4: Findings

This report's Findings are classified into several sections. First, the interview findings involve two subsections, WPI faculty advisors and sponsors. The results of these interviews show that WPI advisors have had mostly positive experiences advising WPI students and in Washington. The sponsors also have had strong positive experiences working with WPI students. However, most sponsor interviews resulted in some kind of recommendation to improve the program. Second, the WPC alumni survey had a good distribution of responses from all years the project center has been in operation. Students typically had a very beneficial experience, with a high percentage of them agreeing that they would be willing to recommend the WPC to another student.

Interviews

The goal of advisor and sponsor interviews was to understand the WPC project experience from their individual perspectives. The general response to interview questions are outlined in this section.

Advisor Interviews

The goals of faculty interviews were to learn about the WPI Plan and its relationship to the WPC and impact of past projects. In general advisors had a positive experience that allowed them to work with others outside their field and learn how to manage project teams. Most advisors agreed that the IQP greatest impact of the WPC IQP project experience was the opportunity it offered students. The following table breaks down the general responses per key question (Table 4.1).

#	Question in Interview	General Response
2	How does the IQP achieve the goal of the WPI Plan?	The WPI Plan was established to increase project based learning in the academic system. The IQP emphasizes social issues and the impacts of science and technology on people through multidisciplinary projects.
3	What do you see as being the greatest impact of the WPI IQP project experience?	The success of the WPC led to the implementation and growth of the Global Projects Program. The IQP is a/an... <ul style="list-style-type: none"> ● Intensive team experience ● Real world, open ended project ● Project that improves communication, flexibility, & problem solving ● New experience - different from Worcester, MA
5	Were there any particularly impactful projects that stood out amongst the others?	Individual interviewees were not able to recall projects that had a significant impact.
8	What are the impacts that advising had on you?	They... <ul style="list-style-type: none"> ● Continued advising (not necessarily at the WPC) ● Had the opportunity to work outside of their discipline ● Had a learning experience - managing student teams, working with a colleague from different department

Table 4.1: General Response of Advisor Interview Questions

Sponsor Interviews

A total of 22 individuals were interviewed from 12 different sponsor organizations. To analyze the interviews, the same process as with the advisor interviews was followed. The goals of sponsor interviews were to learn about the impacts of the projects completed at the WPC, understand the sponsor's experience and collect recommendations from the sponsors. All of the individuals said they had an overall positive experience, provided recommendations for WPI, and gave examples of project impact (Table 4.2).

#	Question in Interview	General Response
3	What were some of the most notable or memorable projects in terms of their outcomes and specific impacts on your organization or on populations or groups that your organization serves?	Most individuals were able to recall memorable projects. For a majority of them the students' work was beneficial to the organization. Generally their work was used to decide whether or not an organization should allocate more resources into an area.
6	How much were students directed by your organization or self-guided?	In general students required more guidance from the sponsor in the beginning, but afterwards were mostly self-guided.
9	Were there any negative or unintended consequences of past projects?	All individuals interviewed responded that the experience was overall positive. Any negative aspects were due to logistics (e.g. work space).
10	What aspects of the project experience could WPI work on to help improve the quality of future projects?	<ul style="list-style-type: none"> • Improve communication between sponsors, advisors and students • All parties should receive feedback on their experience
11a	What advice would you give to future students wanting to work with your organization?	<ul style="list-style-type: none"> • Be proactive and take initiative • Don't be intimidated to ask questions and propose new ideas • Take advantage of your time in D.C.
11b	What advice would you give to organizations looking to work with WPI students?	<ul style="list-style-type: none"> • Have multiple points of contact per team • Have a clear project question

Table 4.2: General Response of Sponsor Interview Questions

A general theme that arose from the interviews was recommendations and advice from the sponsors. From their responses a List of Advice for Students, List of Advice for Sponsors and List of Recommendations for WPI were created. In general, most individuals encouraged students to be proactive, not be intimidated to ask questions, and suggest new ideas (Table 4.3).

List of Advice for Students	
<ol style="list-style-type: none"> 1. Don't be Intimidated... <ol style="list-style-type: none"> a. to ask questions - sponsors recognize you are not experts b. by rank - sponsors are there to help c. to propose new ideas - sponsors want to hear what you have to say 2. Take Initiative: be confident in your work and always look for opportunities 3. Get out of the Cube: take advantage of your time in Washington 4. Teamwork: <ol style="list-style-type: none"> a. Work Hard - the on-site term goes by fast b. Be Open Minded - recognize that you are not an expert, but that you are capable c. Be Efficient - use everyone's cross-disciplinary skills 5. Sponsors: be proactive and reach out to your sponsor when you need them to be more involved 6. Additional Advice: reach out to students from the previous IQP team(s) 	

Table 4.3: List of Advice for Students

Most of the sponsors interviewed gave guidelines for designing an appropriate project that was open ended, but with a clear question in mind. Most agreed that early communication on expectations was key to a successful project. Another frequent topic was the relationship between sponsors and students. Most of the individuals felt that students should be treated as employees of the organization and not as interns, in order to re-emphasize the importance of their work (Table 4.4).

List of Advice for Sponsors

1. Designing a Project:
 - a. Type of Project - the best suited project is one where, if students are successful, their work can have real benefits, however projects on the critical path should be avoided. “Make work” projects should also be avoided. Projects that are running (funded and staffed) work well because the students’ work can be integrated into existing work.
 - b. Topic - having a clear question avoids confusion on project expectations
 - c. Time Management - the project should be realistically doable in the seven weeks
 - d. Interesting and Useful - students fully immerse themselves into these projects if they believe the outcome is meaningful
 - e. Follow Up - typically most projects have follow up IQP team to continue or expand the work already done.
2. Expectations: calibrate expectations well in advance with both students and advisors. Other than meeting the goals of the organization, students also have to meet the goals of the IQP therefore it is important to make expectations clear.
3. Sponsor Responsibilities:
 - a. IQP Program - learn about the program and its goals to better understand the students work and other responsibilities
 - b. Dedication - it’s important to understand that sponsoring an IQP is an extra responsibility and time commitment that is successful when the right amount of effort is put in
 - c. Teamwork - having more than one point of contact per IQP team can be extremely helpful
4. Communication: start communication with students and advisors early and frequently, speaking with the students more often during the prep-term ensures that there is less confusion on the project prior to arrival in Washington
5. Students:
 - a. Maturity - students are mature and should be treated like adults
 - b. Get to know the students - learn about their background and goals
 - c. Don’t Micromanage
 - d. Be Open Minded - students come in with new perspectives and new ideas
6. Student or Intern or Employee: though the IQP program may seem like an internship, sponsors agree that students should be treated like real employees of the company, by integrating and exposing students to the office culture and other work related activities.

Table 4.4: List of Advice for Sponsors

In general the recommendations for WPI to improve the WPC project experience involved stronger communication between sponsors, advisors and students and having more feedback from all parties at the end of the project (Table 4.5).

List of Recommendations for WPI	
1.	Communication: stronger, open communication between sponsors, advisors and students would prevent confusion and contradiction over project expectations <ul style="list-style-type: none"> a. Encourage sponsors and advisors to meet before the on-site term to calibrate project expectations
2.	Feedback: having feedback from all individuals involved at the end of the project would be beneficial in improving the types of projects offered, method of conducting the projects and other aspects of the experience
3.	Students: sponsors agree that knowing more about the students would improve the projects, the following topics are what sponsors frequently mentioned <ul style="list-style-type: none"> a. Academic Backgrounds - resume, classes taken b. Personal Goals - why did they choose the project location, why they choose that particular project, what type of mentorship they are looking for, and what do they hope to gain
4.	Examples: because the liaisons from sponsors change frequently, having examples of successful projects would be good for new liaisons
5.	Sponsor Involvement: sponsors like to be involved with WPI, having a meet and greet with all the students and sponsors would encourage a stronger partnership
6.	Additional Workspace: because some sponsors are farther away, it is beneficial that students are able to work from their residence of stay or from other locations in the surrounding area.

Table 4.5: List of Recommendations for WPI

WPC Alumni Survey

The survey results were exported into MS Excel and the response for each question (excluding open response) were delivered to Dean Rissmiller. Every question was optional for the survey, so the sample size for some questions can vary as questions could be skipped. The survey had a valid population of 705 people and a sample size of 187 responses. The entirety of the survey answers are within the supplementary materials to this report.

Characterizing the Population

The first objective in analyzing the survey’s results was to characterize the population of the responses. As expected, there were more men than women, 74.9% v. 24.6% respectively (n = 183), who responded to the survey (Appendix K). This is similar to the population demographics of WPI, where men are 63.9% and women are 36.1% of the population (“2017 Fact Book”, 2017). However, over the past 43 years the population demographics of WPI have changed, so it cannot be confirmed whether the gender distribution of this survey is the same as that of WPI. Another demographic of the responses was the major of the alumni. The three most prevalent majors were Mechanical Engineering, Electrical and Computer Engineering, and Chemical Engineering with 26.2%, 18.7%, and 12.8% [n = 187] of alumni entering it as their major. Finally, the year of attendance was graphed and interestingly more responses were received from the first 10 years than the last 10 years, 62 and 37 respectively. The distribution is

shown below (Figure 4.1). However, the distribution of the valid population is unknown, so this does not imply alumni from the first 10 years are more likely to answer a survey on their experience at the WPC.

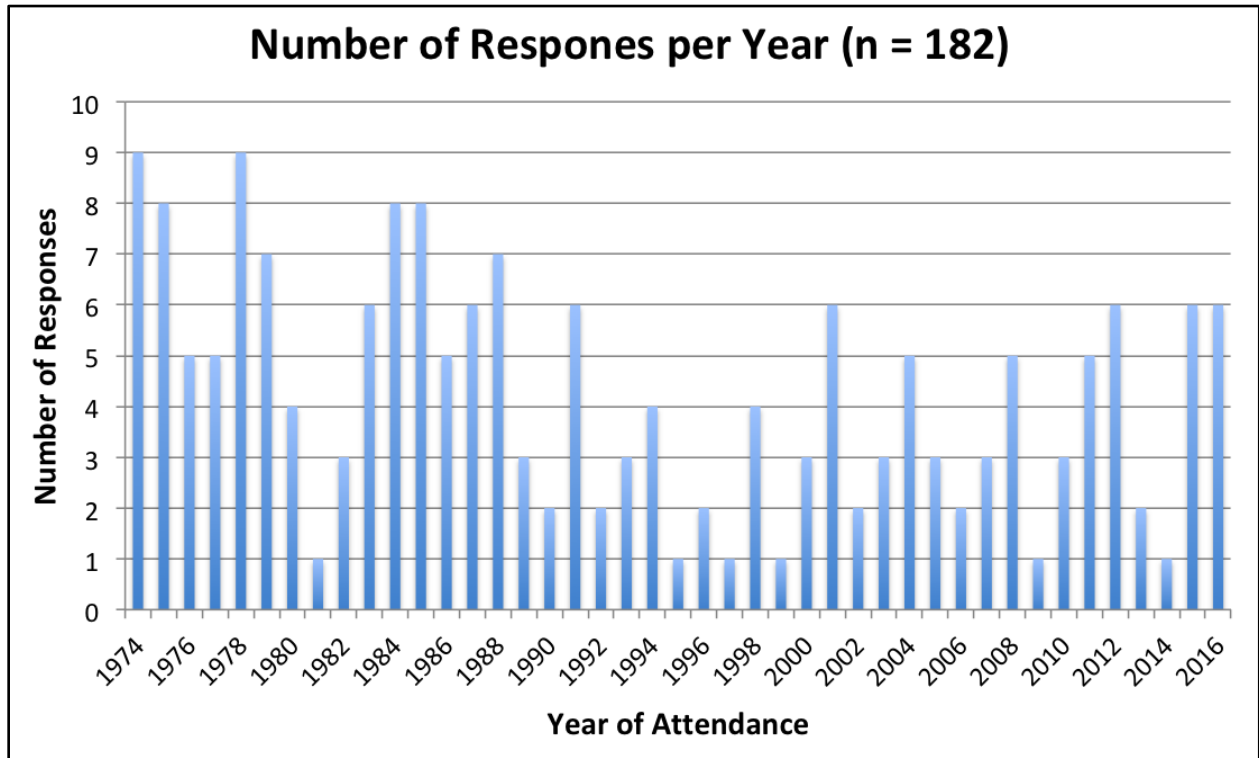


Figure 4.1: Number of Survey Responses per Year

Overall - Likert and Demographic

The alumni had strong positive experiences while completing their IQP in Washington. For example, 70.9% [n = 186] of WPC alumni strongly agree or somewhat agree that “Their IQP experience benefited them in their professional career after graduation”. Another Likert question asked students if they believed that a variety of their abilities have been enhanced through their IQP experience. The percentage that strongly agree or somewhat agree was graphed and overall 80-90% of students believed that their abilities were enhanced from completing their IQP in Washington. Shown below is the graph of agreement for each ability (Figure 4.2). This question shows the benefits of the IQP experience for the students, but arguably does not show they had an ‘enjoyable’ experience. As 70.9% [n = 186] of alumni would recommend the project center to another student, it is assumed they had a positive experience. However, in the last 10 years 81% [n = 37] of alumni would recommend the project center to other students and to learn more see “Comparing the First 10 Years to the Last 10 Years” below. The survey also asked alumni if their project experience had a positive impact on them personally; 78.1% [n = 187] of alumni strongly or somewhat agreed with this prompt.

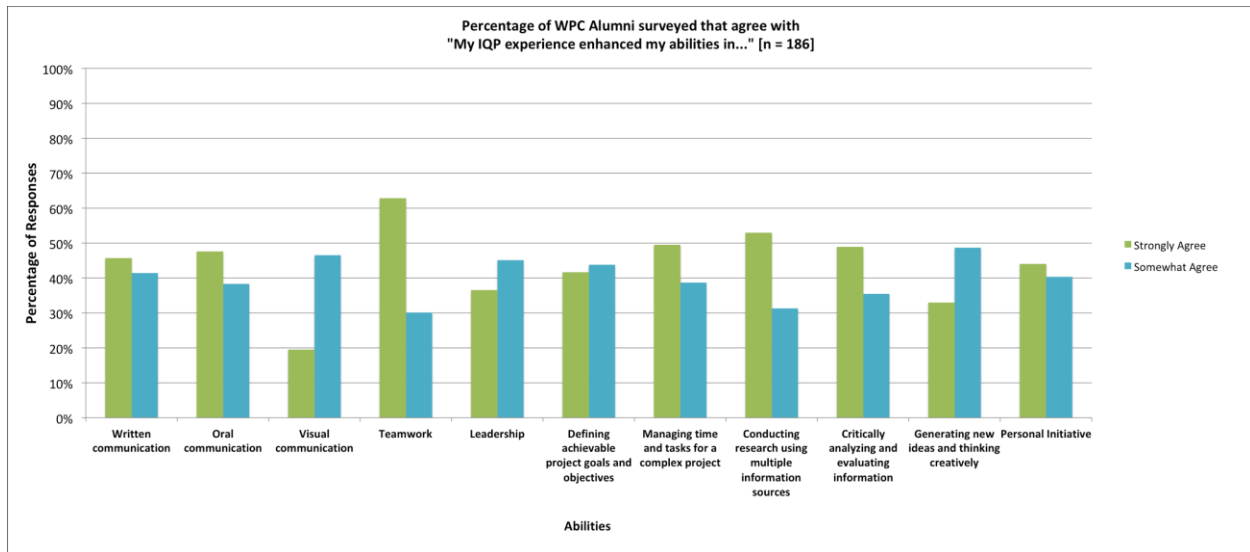


Figure 4.2: Percentage of WPC Alumni Surveyed Whose Abilities Were Enhanced

Overall - Open-Response Answers

General Open-Response

This survey contained 20 open-response questions, the majority asking alumni to elaborate on their answers within the Likert scaled questions. The responses elaborating on Likert scaled questions were used to learn more about why the alumni had answered the way they did. Below is a response from one alumnus, they strongly agree and somewhat agree to having their abilities enhanced in every area.

Regular presentations to the group and agency definitely helped in preparing and delivering presentations to diverse audiences.

WPC Alumni, Class of '91

These kinds of anecdotes are listed in the "WPC Survey Results" PDF document that is included with this report. They influenced the recommendations of this report, but were not quantitatively analyzed.

Open-Response with Recommendations

A question of the survey asks alumni, if they could change three things about their IQP experience, what would they be? This question produced good material that can easily and directly support Chapter 5: Recommendations. Some of the changes provided by alumni are listed below. In bold are changes suggested by at least one alumni who wouldn't recommend the project center to another student.

Aspect of IQP Experience	Desired Change
Personal Experience	<ul style="list-style-type: none"> ● WPI distribute “things to do” in the area ● Do a project in Europe instead ● More organized group outings
Project	<ul style="list-style-type: none"> ● More internal support from WPI ● Better defined project goals and objectives ● Better group members ● Have feedback on how their project was used and the impacts it had ● Make the IQP two terms instead of one ● More communication with sponsor during the prep-term <ul style="list-style-type: none"> ○ Communication with past WPC students during the prep-term if possible ○ Better clarification of desired results from advisors and sponsors ○ More frequent supervision by advisors so students know if they are making good progress to the final product ○ Stronger / more involved advisors
Logistics	<ul style="list-style-type: none"> ● The food at the hotel wasn’t that good ● Wished they had a longer project timeline ● Know if public transportation can get students to workplace in a reasonable time ● Prepare students to work with a federal agency ● Ensure project sponsors understand the concept of the IQP (logistics, goals, etc.) ● Do not go in the middle of the fiscal year ● Housing that doesn’t put 3 people in a two room suite
Networking	<ul style="list-style-type: none"> ● With local WPI alumni in Washington. ● With more members of the organization they worked for

Table 4.6: Alumni Survey Feedback

These are not the only changes that alumni suggested, but some within the survey cannot be directly applied to this report. For example, some alumni who wished that their housing was different attended the WPC in the 1980’s. However, the housing has changed several times since then and thus this doesn’t affect the recommendations. It does show that there was discontent in the housing and WPI has improved the housing substantially. In 2017, the WPC students stayed at a hotel with maid service and complimentary breakfast as well as a modest supper three nights per week.

Comparing the First 10 Years to the Last 10 Years

An area of investigation important to Dean Rissmiller is how students' experience has changed from the first 10 years of the project center (1974 - 1983) to the most recent 10 years of the project center (2007 - 2016). Shown below (Figure 4.3) is the comparison between these time periods on their agreement with recommending the WPC to other students. Only 37% [n = 60] of students who attended the project center during the first 10 years strongly agree or somewhat agree that they would recommend students complete their IQP at the WPC. However, 81% [n = 37] of students in the past 10 years strongly agree or somewhat agreed with that same prompt! This is a significant discrepancy that stands out among comparisons between the first 10 years and last 10 years at the WPC.

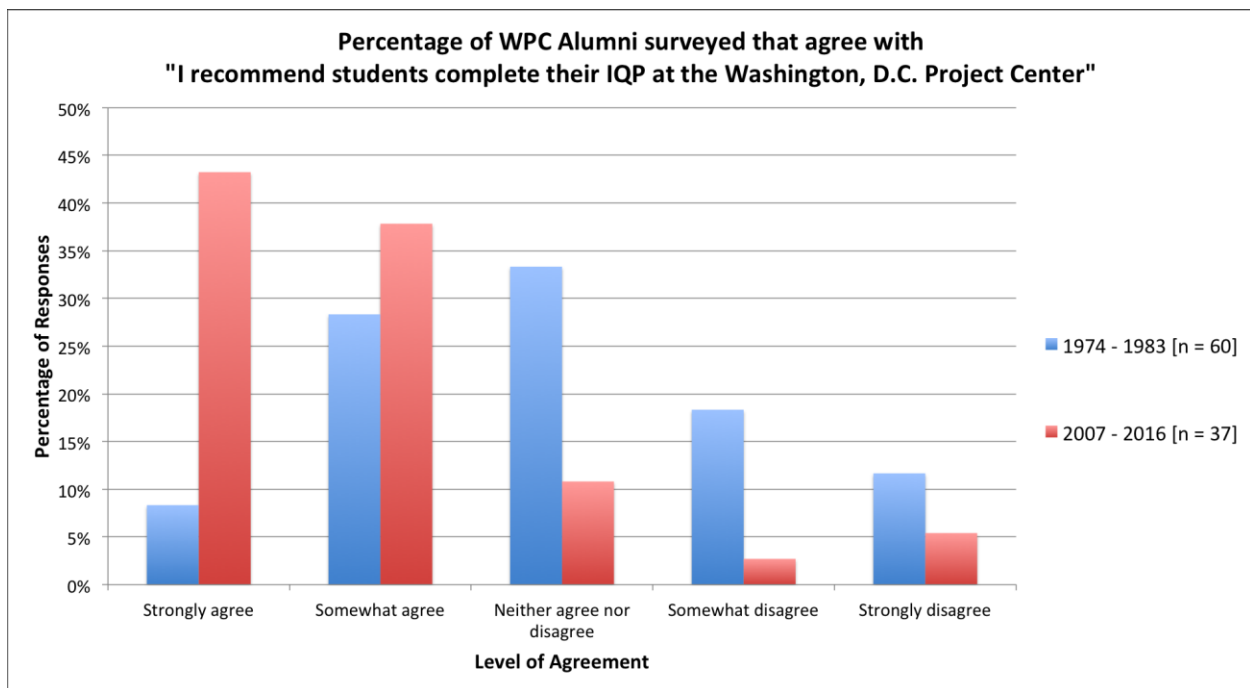


Figure 4.3: Comparing Students Opinion on the WPC

Comparing the beginning and present for other answers to other questions was also done (Appendix L). For example, the percentage of WPC alumni surveyed that believed their project affects the general public is 48.6% [n = 37] in the last 10 years while in the first 10 years only 8.3% [n = 60] believe this prompt. However, most of the other responses did not have as significant a difference between the first 10 years and the last 10 years. The consistency of the answers from the beginning and the present was surprising, as not only was the project center and WPI different, the alumni answering the survey are among different age groups which could impact the way in which they answer the survey questions. Another issue is that there is no way of knowing if someone who had a positive experience at the WPC is more likely to answer the survey than someone who had a negative experience.

Chapter 5: Outcomes / Accomplishments

There are two major outcomes/accomplishments of this project. First is the database of past projects that contains data on each individual student who has attended the project center. Second is a website for the WPC that showcases the project work of past students and serves as an information tool for prospective students and sponsors.

Database

With a complete database, WPI now has a full record of past WPC students and their projects, in one place. In the 43 years since the project center was founded, this is a first. The hope is that WPI's upcoming eProjects 2.0 system takes advantage of the database for projects that have no electronic record. It should be noted, however, that this database deals exclusively with IQP's, and does not contain any records of MQP's. Even without the inclusion of MQP's completed at the WPC, the database contains over twelve-hundred entries (Figure 5.1, 5.2).

1	Student	Email	Current Business Info.	Major 1	Graduation Year	Project Term	ProjectYear	Center Director	Advisor 1	Advisor 2	Sponsoring Organization	Type of Organization
2	Student 1	student@email	HN/A	ME	1975	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Commerce	NG
3	Student 2	student@email	HN/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Commerce	NG
4	Student 3	student@email	HN/A	PH	1975	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Commerce	NG
5	Student 4	student@email	HN/A	CS	1975	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Commerce	NG
6	Student 5	student@email	HN/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Health, Education & Welfare	NG
7	Student 6	student@email	HN/A	LS	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Health, Education & Welfare	NG
8	Student 7	student@email	HN/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Housing and Urban Development	NG
9	Student 8	student@email	HN/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Housing and Urban Development	NG
10	Student 9	student@email	HN/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Housing and Urban Development	NG
11	Student 10	student@email	HN/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	U.S. Department of Housing and Urban Development	NG
12	Student 11	student@email	HN/A	CH	1975	A	1974	Frank Lutz	J. Demetry	F. Lutz	Public Technology Institute	PC
13	Student 12	student@email	HN/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	Public Technology Institute	PC
14	Student 13	student@email	HN/A	CM	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	National Association of Manufacturers	PS
15	Student 14	student@email	HN/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	National Association of Manufacturers	PS
16	Student 15	student@email	HN/A	CE	1976	A	1974	Frank Lutz	J. Demetry	F. Lutz	National Association of Manufacturers	PS
17	Student 16	student@email	HN/A	EC	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	Public Technology Institute	PC
18	Student 17	student@email	HN/A	MA	1975	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Commerce	NG
19	Student 18	student@email	HN/A	ME	1975	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Commerce	NG
20	Student 19	student@email	HN/A	ME	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Commerce	NG
21	Student 20	student@email	HN/A	CE	1975	B	1974	Frank Lutz	S. Staples	F. Lutz	Public Technology Institute	PC
22	Student 21	student@email	HN/A	ME	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	Public Technology Institute	PC
23	Student 22	student@email	HN/A	MG	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Transportation	NG
24	Student 23	student@email	HN/A	EE	1976	B	1974	Frank Lutz	S. Staples	F. Lutz	U.S. Department of Transportation	NG

Figure 5.1: Screenshot of Final Database 1

Project Title	eProjects #	Page	Abstract
Technology Indicators	#N/A	#N/A	This project, prepared in association with the U.S. Department of Commerce, Washington D.C., explored the
Technology Indicators	#N/A	#N/A	This project, prepared in association with the U.S. Department of Commerce, Washington D.C., explored the
Technology Indicators	#N/A	#N/A	This project, prepared in association with the U.S. Department of Commerce, Washington D.C., explored the
Technology Indicators	#N/A	#N/A	This project, prepared in association with the U.S. Department of Commerce, Washington D.C., explored the
Spacevision: A New Concept In Education	#N/A	#N/A	This project, prepared in association with the National Institute of Education, Washington D.C., focuses on th
Spacevision: A New Concept In Education	#N/A	#N/A	This project, prepared in association with the National Institute of Education, Washington D.C., focuses on th
Program Planning For Evaluation	#N/A	#N/A	In this project, prepared in association with the Department of Housing and Urban Development in Washing
Program Planning For Evaluation	#N/A	#N/A	In this project, prepared in association with the Department of Housing and Urban Development in Washing
Program Planning For Evaluation	#N/A	#N/A	In this project, prepared in association with the Department of Housing and Urban Development in Washing
Municipal Applications Of Cable Television	#N/A	#N/A	This project, prepared in association with Public Technology, Inc., Washington, D.C., explores the application
Municipal Applications Of Cable Television	#N/A	#N/A	This project, prepared in association with Public Technology, Inc., Washington, D.C., explores the application
Feasibility Of Conversion To Direct Coal Combustion	#N/A	#N/A	This project, prepared in association with the National Association of Manufacturers, in Washington, D.C., ex
Feasibility Of Conversion To Direct Coal Combustion	#N/A	#N/A	This project, prepared in association with the National Association of Manufacturers, in Washington, D.C., ex
Disinfection: Is Chlorine Still The Answer?	#N/A	#N/A	This project, prepared in association with Public Technology, Inc., Washington, D.C., addresses emerging pro
Wastewater Treatment Survey	#N/A	#N/A	This report, prepared in association with Public Technology Incorporated, studies the most important param
Technology Indicators	#N/A	#N/A	This report, prepared in cooperation with the U.S. Department of Commerce, analyses the effects of produc
Technology Indicators	#N/A	#N/A	This report, prepared in cooperation with the U.S. Department of Commerce, analyses the effects of produc
Technology Indicators	#N/A	#N/A	This report, prepared in cooperation with the U.S. Department of Commerce, analyses the effects of produc
Remote Sensing And Local Jurisdictions' Capabilities And Needs	#N/A	#N/A	This report, prepared in association with Public Technology Incorporated, analyses the capabilities of satellit

Figure 5.2: Screenshot of Final Database 2

The database was developed to contain maximum information relating to individual students, and for easy readability. While having each row be based on students, rather than project completed results in some repetition, the benefit far outweighs any disadvantage to this system of organization. As can be seen above (Figure 5.1, 5.2), far more information relating to individual students can be included than the alternative. Additionally, the top row and fourth column were chosen to be frozen, to aid in readability by maintaining clarity about what information each row and column contains.

WPC Website

The WPC website was developed in order to showcase the experiences of past students, and to provide information to prospective students and sponsors. It can be accessed at <http://wp.wpi.edu/washingtondc/>. The website incorporates data from the database to construct a timeline and project pages. Shown below (Figure 5.3) is the homepage of the website.



Figure 5.3: WPC Website Home Page

There are 6 tabs that can be used to navigate the website. Starting on the left side, the “Home” tab redirects the user to the homepage of the website. This page has a slideshow (Figure 5.3) and links to the timeline and Flickr account. The next page “About” contains general information on WPI, WPC, Washington. It also contains a timeline (Figure 5.4) which has pictures and anecdotes of WPC alumni.

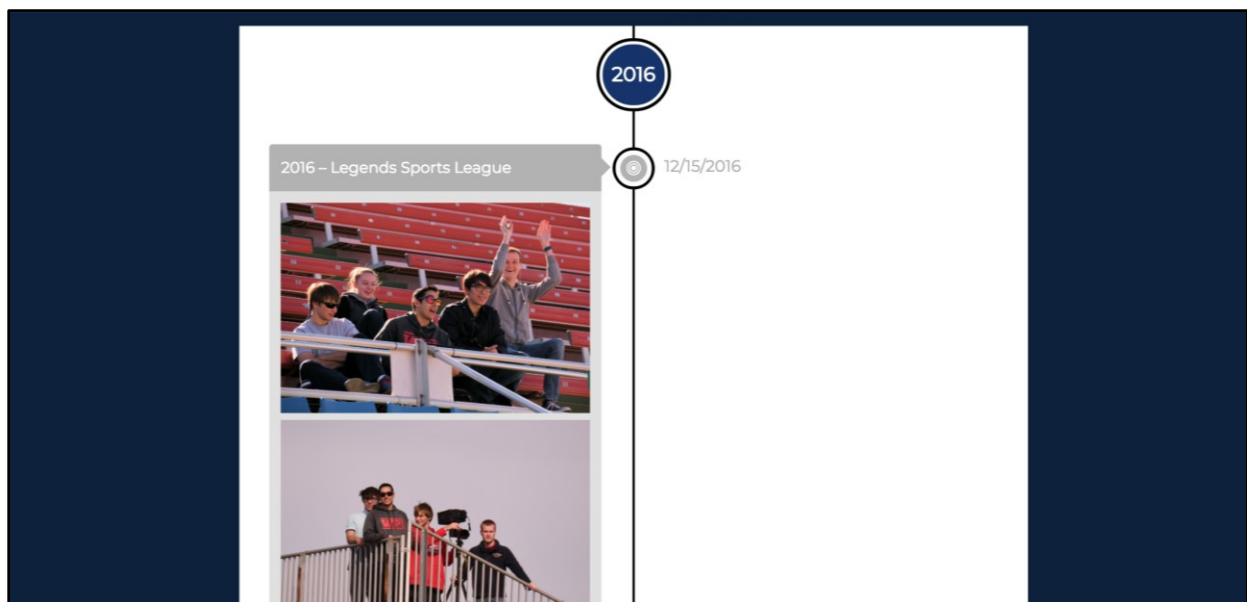


Figure 5.4: WPC Timeline Showcasing Students Experiences at the WPC

The “Students” tab has two main sections, impacts on students and information for prospective students. The impacts on students tab summarizes the results from the WPC alumni survey saying that WPC alumni have had a strong positive experience while completing their IQP in Washington. The other section presents information on things to do, past student work, and an FAQ section for WPI students in their sophomore year thinking about completing their IQP in Washington. The “Sponsors” section contains impacts on sponsors, a recognition of past sponsors, and information for prospective sponsors. The prospective sponsors section is broken down into general information, partner guidelines, and an FAQ. These sections are meant to help those interested in working with the WPC learn more about the unique IQP experience. The “Projects” tab has project pages (Figure 5.5) from 2008 - 2017 organized in three different ways: sponsor, year, and theme. These project pages display general information on each project such as student names, sponsor, project title, and links to their project outcomes.

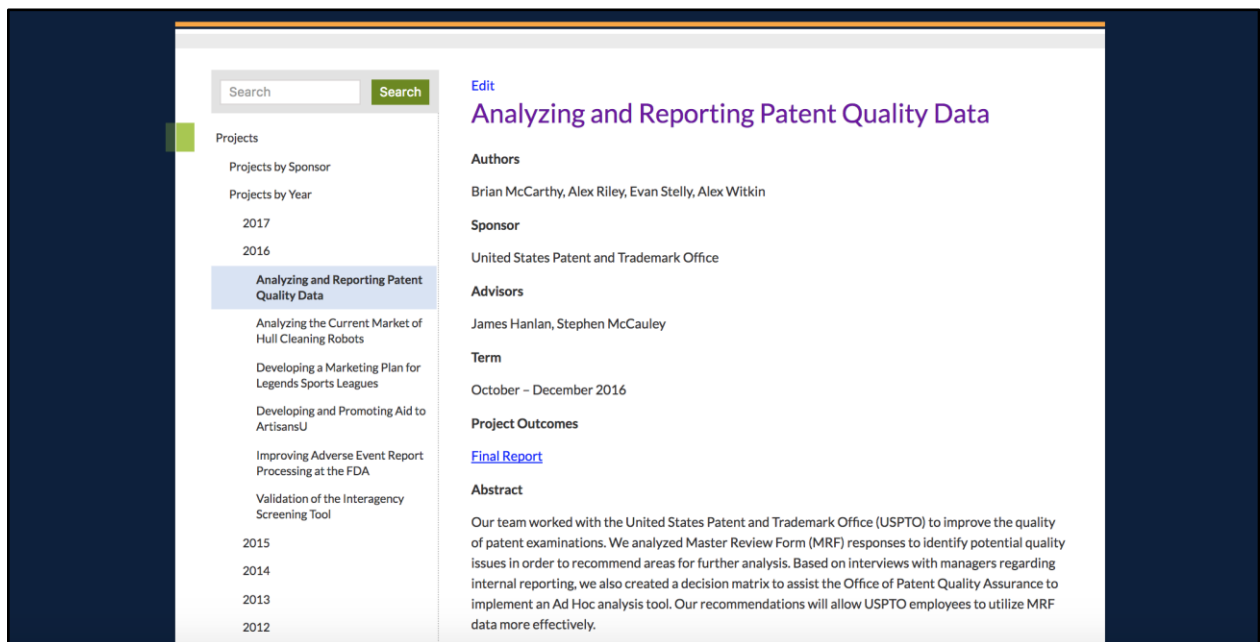


Figure 5.5: Project Page for USPTO Team in 2016

The final tab is the “Contact” tab, which simply has contact information for the WPC Director, Dean Rissmiller.

Chapter 6: Recommendations

The project found recommendations for improving the WPC experience and future analysis of impacts. The following recommendations are made to WPI and the IGSD department to improve the both the WPC and the overall Global Projects Program experience. These recommendations stem from the feedback given by sponsors during their interviews and WPC alumni from their surveys, advisor interviews didn't contribute to the recommendations.

Recommendation 1: During the ID 2050 course, WPC advisors should encourage students to meet with their liaison more than once.

In general both sponsors and WPC alumni agreed that at times, the background research conducted during the prep term had a different focus from what the project entailed. From interviews, sponsors have said that the contact during the prep-term and the short prompt they provide to WPI usually isn't enough for the students to adequately understand the project question. By meeting more often during the prep term, the interaction between parties can begin earlier and the project can be mutually scoped by both the students and sponsor. Because the IQP is an added responsibility and time commitment, it is sometimes difficult for the sponsors to initiate contact with the students. Sponsors recommended that the student team try and initiate contact several times throughout the prep term. This is a great opportunity for students to keep their background research focused on the project goals while also allowing them to present new and interesting ideas to their sponsor as they explore the area of research.

Recommendation 2: During the ID 2050 course, WPC advisors should encourage students to send their academic and professional background to their liaison.

A majority of sponsors felt that by knowing more about the student's background they would be better able to improve and guide the projects. The material that sponsors would like to receive include: resume, major, list of classes taken and a short reflection on what they are looking for from the project experience. By receiving this material, sponsors can expand the project scope and look for opportunities to apply their knowledge and skills to the project's benefit.

Recommendation 3: During the first week of the on-site term, advisors, liaisons and students should meet to have an open-discussion about the project scope and calibrate expectations.

Liaisons and WPC alumni have expressed that often goals of each party involved can be contradicting or different. By having advisors, liaisons and students at the beginning of the on-site term all groups can have an open-discussion about realistic project scopes and expectations. This ensures all groups start on the same page. The goal of this recommendation is similar to that of Recommendation 4. The WPC already has students meet with their sponsors during the first week, this recommendation is meant to add this topic to the meeting agenda of that first meeting.

Recommendation 4: Advisors and liaisons should meet in an open-discussion about the expectations of each party early on in the process.

Sponsors have voiced that they do not feel comfortable having a discussion on project expectation differences with advisors when the students are present. A meeting with only advisors and liaisons allows both groups to establish mutual expectations of the project to meet both the goals of the organization and the goals of the IQP. Expectations from students such as written progress reports, certain writing styles, and the report should be discussed. As well, both advisors and liaisons should try and determine if there might be potential issues with what they expect students to submit each week and what the organization expects the student to do. The goal of this recommendation is not to try and eliminate the dynamic where students have to work with two different groups, but to start the process on the same page. The recommended method to carry out this recommendation is to have this meeting directly after the meeting in recommendation 3.

Recommendation 5: WPI should provide new sponsors and liaisons examples of successful student teams and scoping.

During interviews, sponsors indicated that when they began partnering with WPI they did not give the students a clear project question. Over several years of working with WPI, they now have a better understanding of what projects work well for the IQP. However, sponsors said that if they received examples of projects that challenged the students, had enough structure, and were able to be completed in 7 weeks they could have had that first project with WPI be more successful.

Recommendation 6: At the end of the project term students should complete evaluations on their experience with their sponsor and these results should be delivered to the sponsor.

Many sponsors expressed interest in having students provide feedback on different aspects of the project experience. Sponsors would like to know how they could improve their mentorship style, types of projects offered and receive general feedback from the students. Currently students fill out evaluations on their overall experience, but these are not provided to the sponsors. Either the existing evaluation could be modified to include additional questions or a separate evaluation could be created. Sponsors who wish can then have the opportunity to review the feedback.

Recommendation 7: In 10 years, a project should be conducted to again investigate WPC impacts and compare it to this report as well as update the website.

The goal of this recommendation is to improve future investigations of impact. The project center was established 43 years ago and therefore a lot of information has been lost. In 10 years approximately 200 - 300 more students will have completed their IQP in Washington and eProjects 2.0 will have more thorough records on projects. This project could examine the recommendations made in this report and any other changes made between 2017 and the time of the project. The recommendation suggests 10 years, but this time frame is up to the center director.

References

- Bernard, H. B. (1984, Nov. 6) "WPI Offers 'Fresh Thinking' in Capital". *The Evening Gazette*, p. 27
- Briggs, C., Getz, L., McGlame, E., & Padberg, M. (2016). *Assessing the Impacts of the London Project Center*. Worcester, MA: Worcester Polytechnic Institute.
- Britannica Academic. (2016). *Environmental Protection Agency (EPA)* Encyclopedia Britannica Inc.
- Bumgardner, S. (2007, Jun 1). June 17, 1972: Watergate Break-in. *American History*, 42, 18.
- Callahan, A., Filippou, S., Henson, K., & Zuccolo, L. (2016b). *Twenty years down under: Documenting the history and assessing the impacts of WPI's Melbourne Project Center supplementary materials*. Worcester, MA: Worcester Polytechnic Institute.
- Churcher, C. (2007). *Beginning Database Design* (1st ed.). Berkeley, CA: Springer-Verlag New York, Inc.
- Cibulski, R. (1974a, Oct 8). News from Washington. *WPI Newspeak* Retrieved from https://issuu.com/wpiarchives/docs/1974_v2_i15
- Cibulski, R. (1974b, Nov 5). News from Washington. *WPI Newspeak* Retrieved from https://issuu.com/wpiarchives/docs/1974_v2_i17
- Cosmas, G. A. (2003). Vietnam War. *Dictionary of American History*, 8, 329-335. Retrieved from http://libraries.state.ma.us/login?gwurl=http://link.galegroup.com/apps/doc/CX3401804406/UHIC?u=mlln_c_worpoly&xid=d818e27b
- Golding, D., Jiusto, S., McCauley S., Ogilvie, A., Rissmiller, K. (2016). *Reports of the Project's Impacts Committee*. Worcester, MA: Presentation presented to WPI President Laurie Leshin.
- Gordon Library, Worcester Polytechnic Institute. (n.d) Past presidents. Retrieved from <https://web.wpi.edu/academics/library/collections/past.html>
- Ha, P. (2010). All-time 100 gadgets. Retrieved from http://content.time.com/time/specials/packages/article/0,28804,2023689_2023703_2023613,00.html
- Heinricher, A. C., & Quinn, P., & Vaz, R. F., & Rissmiller, K. J. (2013, June). Long-term impacts of project-based learning in science and engineering. *2013 ASEE Annual Conference and Exposition*, Atlanta, Georgia.
- Heinricher, A., Quinn, P., Vaz, R., & Rissmiller, K. (2013). *Long-term impacts of project-based learning in science and engineering (paper ID: 7159)* American Society for Engineering Education.

- Holland, B. A. (2001). A comprehensive model for assessing service-learning and community-university partnerships. *New Directions for Higher Education*, 2001(114), 51-60.
doi:10.1002/he.13.abs
- Lawrence, D., Tavakol, S. (2006). *Balanced website design*. London, UK: Springer-Verlag London.
doi:10.1007/978-1-84628-795-4
- Moss, K. B. (2003). Oil crises. *Dictionary of American History*, 6, 178-179. Retrieved from http://libraries.state.ma.us/login?gwurl=http://link.galegroup.com/apps/doc/CX3401803063/UHIC?u=mlic_worpoly&xid=902272c0
- Office of Academic Affairs, WPI. (2017). *BannerWeb data export [banner dataset]*.
- Rissmiller, K. (2017) [Historical List of Students]. Unpublished raw data.
- Shea, T. (1983, Jun 13). Shrinking drives increase in storage. *InfoWorld*, 5.
- Stoecker, R., Beckman, M., & Min, B. H. (2010). Evaluating the community impact of higher education community engagement. In H. E. Fitzgerald, C. Burack, & S. Seifer (Ed.), *Handbook of engaged scholarship: The contemporary landscape: Vol. 2.: Community-campus partnerships* (pp. 177-191). East Lansing, MI: Michigan State University Press.
- Washington Project Center. (2017). Washington, D.C. Project Center. Retrieved from <http://wp.wpi.edu/washingtondc/>
- Worcester Polytechnic Institute. (a). DigitalCommons@WPI. Retrieved from <http://digitalcommons.wpi.edu/newspeak-index/>
- Worcester Polytechnic Institute. (b). Global portal - programs : Program search. Retrieved from <https://wpi-sa.terradotta.com>
- Worcester Polytechnic Institute. (c). Global projects program. Retrieved from <https://www.wpi.edu/project-based-learning/global-project-program>
- Worcester Polytechnic Institute. (d). WordPress - WPI. Retrieved from <https://web.wpi.edu/webapps/wordpress.html>
- Worcester Polytechnic Institute. (1974, Oct 15). News from Washington. *WPI Newspeak* Retrieved from https://issuu.com/wpiarchives/docs/1974_v2_i16
- Worcester Polytechnic Institute. (1995). London Project Center. Retrieved from <http://wp.wpi.edu/london/>
- Worcester Polytechnic Institute. (2004). Worcester Polytechnic Institute: Electronic projects collection. Retrieved from <https://web.wpi.edu/E-project-db/E-project-search/search>
- Worcester Polytechnic Institute. (2015). 150 years: Imagine more. Retrieved from <http://150.wpi.edu/>

Worcester Polytechnic Institute. (2017). 2017 Fact Book. Retrieved from https://www.wpi.edu/sites/default/files/inline-image/Offices/Institutional-Research/2017%20Fact%20Book_3.pdf

Worcester Polytechnic Institute. (2017). 2017 Institute on Project-Based Learning. Retrieved from <http://wp.wpi.edu/projectbasedlearning/home-page-slideshow/2016-institute-on-project-based-learning/>

Worcester Polytechnic Institute. (2017). Melbourne Project Center. Retrieved from <http://wp.wpi.edu/melbourne/>

Worcester Polytechnic Institute. (2011). The story of the WPI plan. Retrieved from <https://web.wpi.edu/academics/library/history/plan/>

Appendices

Appendix A - Impact Model



Appendix B - Melbourne Project Center Home Page

Melbourne Project Center
Worcester Polytechnic Institute

WPI

HOME ABOUT STUDENTS PARTNERS PROJECTS BLOG CONTACT US

MELBOURNE

Welcome to WPI's Melbourne Project

Search Search

(“Melbourne Project Center”, 2017)

Appendix C - London Project Center Alumni Survey

(Briggs et al., 2016)

London Project Center Alumni Survey

Thank you for taking the time to complete this survey, it will be greatly helpful towards our development of an understanding of the impact of the London Project Center. Please note that your responses will be used to generate statistics for our final report. All questions are optional and all responses will be anonymous. No names will be included in the final report, without the explicit consent of the person being quoted.

Q1 When did you complete your IQP? (Term and year)

(Drop down menus for term and year)

Q2 Which type of organization sponsored your project?

- Museum or Gallery (e.g. Science Museum, Tate) (1)
- Social Service Organization (e.g. Royal National Institute for the Blind, Commonsense Development Trust) (2)
- Professional or Scientific Organization (e.g. Institute of Structural Engineers, Royal Geographical Society) (3)
- National Government Agency (e.g. Department of Environment and Climate Change) (4)
- Local Government Authority (e.g. borough council) (5)
- Private/Semi-private Corporation (e.g. Crossrail, Transport for London) (6)
- Other (Please specify) (7) _____

Q3 How important were each of the following aspects of the London Project Center in influencing your decision to complete your project in London?

	Very important (1)	Important (2)	Moderately important (3)	Minimally important (4)	Not important (5)
Geography (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
City Setting (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interesting Projects (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunities to explore a new culture (4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Similar language and familiarity (5)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Available in desired terms (6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q4 Looking back at your experience in London, how did completing IQP at the London Project Center...

	Very significantly (1)	Significantly (2)	Moderately (3)	Minimally (4)	Not at all (5)
Impact your subsequent academic endeavors at WPI? (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Create new opportunities for you professionally? (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Change or influence your career goals? (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5 Please comment on the reasoning behind your above answers to the fullest extent possible.

Q6 How did your IQP experience at the London Project Center influence you in the following skill categories?

	Very positively (1)	Positively (2)	Neither positively nor negatively (3)	Negatively (4)	Very Negatively (5)
Interpersonal Communication (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oral Presentation (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working to deadlines (4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teamwork (5)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7 Please comment on the reasoning behind your above answers to the fullest extent possible.

Q8 How did your IQP experience at the London Project Center influence...

	Very positively (1)	Positively (2)	Neither positively nor negatively (3)	Negatively (4)	Very negatively (5)
Your personal growth? (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your global perspective (your awareness of other countries' customs, your ability to learn from and interact with people of cultures different from your own)? (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q9 Please comment on the reasoning behind your above answers to the fullest extent possible.

Q10 Looking back, how did completing your IQP at the London Project Center impact your subsequent academic endeavors at WPI?

- Very Positively (1)
 Positively (2)
 Neither positively nor negatively (3)
 Negatively (4)
 Very negatively (5)

Q11 Please comment on the reasoning behind your above answers to the fullest extent possible.

Q12 To what extent do you feel like your project had a lasting impact on the organization by which you were sponsored?

- Very significant (1)
 Significant (2)
 Moderate (3)
 Minimal (4)
 Not at all (5)

Q13 Please comment on the reasoning behind your above answers to the fullest extent possible.

Q14 To what degree would you recommend completing a project through the London Project center to another student?

- Strongly recommend (1)
- Recommend (2)
- Neither recommend nor advise against (3)
- Advise against (4)
- Strongly advise against (5)

Q15 Please comment on the reasoning behind your above answers to the fullest extent possible.

Q16 (Optional) What is your name? Your name will not be disclosed to outside parties of this project, but you may be contacted for a follow-up clarification on your responses and/or asked for permission to attribute you to a quote.

Q17 What is your gender?

- Male (1)
- Female (2)
- Other (3)
- Prefer not to respond (4)

Q18 Do you have any photographs from your London experience that you would be willing to submit for potential inclusion in a London Project Center 30th anniversary celebration? If so:

- Yes (1)
- Maybe (2)
- No (3)

Q19 Please submit photographs to: lpc-16e4@wpi.edu For proper attribution please provide your name, year/term of completion, and short description of photos. These photographs may be used in a slideshow or other type of display created by the project center for a 30th Anniversary Celebration.

Q20 If you would like to be entered to win an Amazon.com gift card, please include the email you would like to be contacted at below. (The email you provide will only be used to notify you if you win).

Appendix D - Melbourne Project Center Alumni Survey

Q1 Thank you for taking the time to complete this survey! It should take about 5-10 minutes, and your response will help us understand the impacts of the Melbourne Project Center and to continue to improve the student experience abroad. We may also use some of this information to further promote the work of our Center and to recruit new sponsors for our projects. Your responses will be kept anonymous unless you indicate that we can use your name. Your email will not be shared, and no identifying information will be included in our final report of this information.

Note:

m : multiple choice, single answer

q: multiple choice, multiple answer

Q2 What is your gender?

m Male

m Female

m Other: _____

m Prefer not to respond

Q3 What year did you complete your IQP?

m 2016

m 2015

m 2014

m 2013

m 2012

m 2011

m 2010

m 2009

m 2008

m 2007

m 2006

m 2005

m 2004

m 2003

m 2002

m 2001

m 2000

m 1999

m 1998

m I don't remember

Q4 What term did you complete your IQP?

- m A
- m B
- m C
- m D
- m E

Q5 What sponsoring organization did you work with to complete your IQP?

- m Museum Victoria
- m CERES Community Environment Park
- m Banksia Gardens Community Centre
- m Zoos Victoria
- m Moreland Energy Foundation Ltd.
- m CSIRO
- m Metropolitan Fire and Emergency Services Board (MFB)
- m Emergency Services Foundation
- m E.W. Tipping Foundation
- m Alternative Technology Association (ATA)
- m Moreland City Council
- m Fawkner Community House
- m Snowy River Innovation
- m Yarra Energy Foundation
- m Fire Protection Association Australia
- m Olsson Fire & Risk, Pty Ltd.
- m AFAC
- m AECOM
- m Bushfire CRC
- m Victorian Deaf Society
- m City of Boroondara
- m Beyond Zero Emissions
- m Vision Australia (VA)
- m City of Melbourne Building Team
- m Fire Services Museum of Victoria
- m Australian Bureau of Statistics (ABS)
- m Victorian Building Commission
- m Country Fire Authority (CFA)
- m Department of Infrastructure of the Victorian Government
- m Royal Botanic Garden (RBG)
- m Capital Management Branch (CMB) of the Department of Human Services
- m Scientific Services Laboratory (SSL)
- m Office of Emergency Services Commission (OESC)
- m Capability Management Pty Ltd.
- m Victorian Department of Education and Training (DET)
- m Victorian Environment Protection Authority (EPA)

m Ove Arup & Partners
 m Other _____

Q6 If Other:

Q7 Which of the following most closely fits the project theme of your IQP? Check all that apply.

- q Education
- q Environment
- q Energy Resources
- q Healthcare
- q Social and Human Services
- q Arts/Culture/Historical Preservation
- q Animal Conservation and Welfare
- q Organizational Process Improvement
- q Economic Growth and Development
- q Urban Planning & Transportation Infrastructure
- q Policy and Law
- q Public Safety

Q8 What kind of deliverables did your project produce? Check all that apply.

- q Training or Educational Materials
- q Promotional Materials and Events
- q New Procedures and Processes
- q Information Repositories, Databases, Websites
- q Computer Programs or Apps
- q Built Structures or Products
- q Designs for Built Structures or Products
- q Recommendations and Proposals
- q New Collaborations and Partnerships
- q Research Study
- q Other: _____

Q9 How important were each of the following aspects of the Melbourne Project Center in influencing your decision to apply to that location?

	Not at all important	Slightly important	Moderately important	Very important	Extremely important	Not sure/Not applicable
Housing	m	m	m	m	m	m
Types of projects offered	m	m	m	m	m	m

Opportunities to explore a new culture	m	m	m	m	m	m
Similar language and culture to mine	m	m	m	m	m	m
Available in desired terms	m	m	m	m	m	m
Recommended by peers	m	m	m	m	m	m
Fun trips and activities in the region	m	m	m	m	m	m

Q10 To what extent did your project experience enhance your abilities in these areas?

	Not at all	A little	A moderate amount	A lot	A great deal	Not sure/Not applicable
Professional written communication	m	m	m	m	m	m
Professional oral communication	m	m	m	m	m	m
Professional visual communication	m	m	m	m	m	m
Working on a team	m	m	m	m	m	m
Leading others	m	m	m	m	m	m
Defining achievable project goals and objectives	m	m	m	m	m	m

Managing time and tasks for a complex project	m	m	m	m	m	m
Conducting research using multiple information sources	m	m	m	m	m	m
Critically analyzing and evaluating information	m	m	m	m	m	m
Generating new ideas and thinking creatively	m	m	m	m	m	m

If in Q10 "A great deal" or "A lot" is selected for one or more items, display Q11:

Q11 You mentioned your project experience enhanced one or more of your skills a lot or a great deal. Can you explain which aspects of the project helped you develop that skill?

Q12 To what extent did your project experience change your awareness of or attitudes about the following?

	Not at all	A little	A moderate amount	A lot	A great deal	Not sure/Not applicable
Connections between society and technology	m	m	m	m	m	m
Global issues	m	m	m	m	m	m
Ethical responsibilities and impact on others	m	m	m	m	m	m
Cultural differences and ways of interacting	m	m	m	m	m	m

The interdisciplinary nature of complex problems	m	m	m	m	m	m
--	---	---	---	---	---	---

If in Q12 "A great deal" or "A lot" is selected for one or more items, display Q13:

Q13 You mentioned your project experience changed your views about one or more topics a lot or a great deal. Can you explain what facet of your project changed your awareness or attitude regarding that topic?

Q14 To what extent did your project affect you personally?

- m Not at all
- m A little
- m A moderate amount
- m A lot
- m A great deal
- m Not sure

If in Q14 something other than "Not at all" is selected, display Q15:

Q15 How may your project experience have changed you on a personal level?

- q Influenced my self confidence
- q Stimulated new interests
- q Motivated personal changes in my lifestyle or attitude
- q Impacted my personal goals
- q New and/or lasting friendships
- q Other: _____

If in Q15 one or more answers are selected, display Q16:

Q16 What about your project affected you personally in that way?

Q17 If you reported growth in any of the skills or viewpoints described, how much did this growth benefit you in your professional work after graduation?

- m Not at all
- m A little
- m A moderate amount
- m A lot
- m A great deal
- m Not sure/not applicable

If in Q17 something other than "Not at all" is selected, display Q18:

Q18 What improved skill or personal growth from the project aided you professionally? How did that help you in your career?

Q19 To what degree do you feel your project had an impact — on either your sponsor, on other organizations or businesses, or on members of the community?

- m None at all
- m A little
- m A moderate amount
- m A lot
- m A great deal

Q20 To your knowledge, which of the following groups were affected by your project? Check all that apply.

- q Sponsoring organization
- q Other organizations or businesses beyond the sponsor
- q General public/members of larger community
- q Specific demographic
- q None of these groups

If in Q20 "Specific demographic" is selected, display Q15:

Q21 What specific demographic was that (e.g. 10-17 year old girls, people with visual disabilities, farmers in the state of Victoria)?

Q22 Can you elaborate on the specific impacts your project had, or any changes that came about as a result of your project?

Q23 Are you still in contact with your sponsor?

- m Yes, I still am.
- m I had some contact after the project, but not any more.
- m No, I had no further contact after leaving Melbourne.

Q24 To what degree would you recommend completing a project through the Melbourne Project Center to another student?

- m Strongly advise against
- m Advise against
- m Neither recommend or advise against
- m Recommend
- m Strongly recommend

Q25 We are looking for action shots (photographs) of students working at their sponsor sites or with community members in Melbourne as well as photos of tangible achievements that grew out of project

work (e.g. an event you orchestrated, something you built or created for the sponsor, etc). If you have of these types of photos, would you would be willing to share with us?

m Yes

m No

If in Q25 "Yes" is selected, display Q26:

Q26 If you have any files readily available, you can upload them here. Otherwise, you can email them to mpcmedia@wpi.edu at any time until December 1st. Note that any media you provide here may be used in the future for MPC promotional materials, such as videos or pamphlets. For proper attribution, please include your name, graduating year, and a short description of the content.

Q27 In our project report, and in future MPC publications, we may wish to quote directly from some of the responses in this survey. Please indicate your preference in terms of attribution below.

m I agree to being quoted and identified.

m I agree to being quoted anonymously as "a MPC alumnus or former student participating in the MPC."

m I would not like to be directly quoted in any form.

If in Q27 "I agree to being quoted and identified" is selected, display Q28:

Q28 Since you indicated you agree to be identified and quoted, we may wish to follow up on your responses with a few quick questions over the phone. If so, would you be willing to be contacted about a phone interview?

m Yes

m No

If in Q28 "Yes" is selected, display Q29:

Q29 Please indicate your name and preferred email address here, and we may contact you within the next month to schedule a brief phone conversation.

Q30 If you would like to be included in a raffle for one of three \$25 Amazon Gift Cards, please provide an email address where we can notify you and send your online gift voucher. The email you provide will only be used to notify you if you win the gift card, or if you indicated that you would be willing to speak with us further.

Q31 If you would like to share a longer testimonial of your experiences, want to elaborate on something this survey did not cover, or have any questions or comments about this survey and the MPC, please don't hesitate to contact us at mpcmedia@wpi.edu!

Appendix E - Melbourne Project Center Sponsor Interview Script

We are conducting this interview to survey your background and experience with the Melbourne Project Center, and to assess the impact that MPC projects may have had on your organization. With your consent, we would like to record your responses for use in our IQP report. Additionally, we would like your permission to publicly disclose your identity and responses to some of the questions in our interview. We can ensure you that any requests for anonymity and confidentiality will be honored, using pseudonyms if necessary. Participation in this interview is voluntary and may be ended at any time.

1. How long have/had you been in connection with the Melbourne Project Center?
2. What different project themes has the MPC and WPI facilitated for your organization?
3. What were some of the most notable or memorable projects in terms of their outcomes and specific impacts of on your organization?
4. Do you know of any data or publications that have documented this impact?
5. Why has/did your organization found it useful to continue sponsoring projects for the MPC? What are the benefits?
6. Overall, how closely did you work with the students who completed their IQP on behalf of your organization? Was it daily, once or twice a week, etc.?
7. How independent or autonomous were the students while working with your organization? Were they competent at working unsupervised?
8. Are you aware of other MPC projects have had on the community your organization serves? How so?
9. Do you know of any members of the community you think we should interview about the impacts these projects have had?
10. (If organization has stopped sponsoring projects) Why was the decision made to stop sponsoring MPC projects?
11. Were there any negative or unintended consequences of the project?
12. What aspects of your project experience could WPI work on to help improve the quality of future projects?
13. Is there anyone else in your organization or anyone outside who has worked with the MPC (or might be interested in working with the MPC) that you can refer us to?
14. Do you have any media - photos, videos, recordings - related to the projects that you could share with us?
15. Do you have any last comments or suggestions? Do you have any questions about our projects, the MPC, or WPI?

Appendix F - WPI Faculty Advisor Interview Script

Advisor Interview Script

Who: First Last Name (Advisor)

Where: Office Location/Meeting Room

When: Date and Time

How: In Person/Phone Interview

Interview Questions:

1. Can we voice record this interview for completeness of information?
2. How does the IQP achieve the goal of the WPI Plan?
3. What do you see as being the greatest impact of the WPI IQP project experience?
4. What do you think the sponsors are looking for from the projects?
5. Were there any particularly impactful projects that stood out amongst the others?
6. Why did you choose to advise?
7. Did you enjoy your time advising in D.C.?
8. What are the impacts that advising had on you?
9. Did you return to advise in D.C.? If so why or why not?
10. Would you be willing to answer any additional questions or clarifications, if needed, over email?
11. Do you have any photographs that you would be willing to submit for potential inclusion in an anniversary celebration?

Appendix G - Interview Request Email for WPC Sponsors



Dear Mr./Ms./Mrs. _____,

We are a student project team from Worcester Polytechnic Institute (WPI) completing our project here in Washington, D.C. The ultimate goal of our project is to help WPI's Interdisciplinary and Global Studies Division assess the history and impact of projects completed by past WPI students at the Washington Project Center. The team will document all past projects and the history of the project center.

We understand that you have worked with WPI student teams.

Would you be available to meet for 30-40 minutes to discuss the Washington Project Center and the projects you have been involved with? Most of our work days are flexible - please let us know what time is best for you.

We look forward to meeting with you at your earliest convenience.

Sincerely,

Alex Avakian, Libertad Escobar, Evan Frost, and Justin Seeley
WPC Team



Evan Frost, Justin Seeley, Libertad Escobar, Alex Avakian (Left to Right)

Appendix H - WPC Sponsor Interview Script

We are conducting this interview to survey your background and experience with the Washington Project Center, and to assess the impact that WPC projects may have had on your organization. With our consent, we would like to record and quote your responses for use in our project which will be published in December, 2017.

If you do not wish to be recorded electronically, we will turn off the recorder now and take notes on paper. You will be given the opportunity to review any notes, quotes, or recording you wish.

Additionally, we would like your permission to quote or reference your responses in our report and our website. For such instances, our team will contact you via email to get your final approval before publication. We can assure you that any requests for anonymity and confidentiality will be honored, and that, if requested, pseudonyms will be used. Participation in this interview is voluntary and may be ended at any time.

This interview is estimated to take 30-40 minutes. Unless you have questions, we would like to begin this interview. Do we have your consent?

1. How many WPI projects have you been directly involved in?
2. What kinds of projects have WPI students completed for your organization as part of their Interactive Qualifying Project?
3. What were some of the most notable or memorable projects in terms of their outcomes and specific impacts on your organization or on populations or groups that your organization serves?
4. What have you seen as a result of WPI project work? These could include actions or investigations by the organization, or publications based on the students' work.
5. Why has your organization found it useful to continue sponsoring projects for the WPC? What are the benefits?
6. How much were students directed by your organization or self-guided?

7. (If students were more self-guided) Did the students push the project in different directions that were unseen? If so how?
8. (If organization has stopped sponsoring projects) Are you aware of why your organization decided to stop sponsoring WPC projects?
9. Were there any negative or unintended consequences of past projects?
10. What aspects of the project experience could WPI work on to help improve the quality of future projects?
11. (a) What advice would you give to future students wanting to work with your organization?
(b) What advice would you give to organizations looking to work with WPI students?
12. Is there anything that we didn't cover that you think we should have?
13. Do you know anyone else whom you think we should interview to discuss the impact of these projects, either in your organization or in the community that you'd be able to put us in contact with?
14. Do you have any media - photos, videos, recordings - related to the projects that you could share with us?
15. Do you have any last comments or suggestions? Do you have any questions about our project, the WPC, or WPI?

Appendix I - WPC Alumni Survey

Preface:

By taking this survey we will be able to better understand the impacts of WPI's Washington, D.C. Project Center (WPC), and more importantly build a project center website. This website will be used to promote the work of the center, aid in recruiting new sponsors and students, and document the experiences of WPC alumni such as yourself.

Thank you for taking the time to complete our survey!

Alex Avakian, Mechanical Engineering
Libertad Escobar, Mechanical Engineering
Evan Frost, Interactive Media and Game Design
Justin Seeley, Electrical and Computer Engineering

This survey should take 15 minutes, and we request that you kindly respond no later than November 27th.

Your participation in this survey is entirely voluntary. If you have any questions about this survey please contact us at: DC17WPC@wpi.edu.

All these questions are optional and your responses will be kept anonymous unless you indicate otherwise. Please do not use the return buttons on your browser, as all progress will be lost. Only use the back button on the bottom left of your screen.

Note:

m: multiple choice, single answer
q: multiple choice, multiple answer

Basic Information:

Q1 What year did you complete your IQP? (Format YYYY)

(fill in) _____

Q2 What term did you complete your IQP?

m A
m B
m C
m D

m E

m I don't remember

Q3 What major did you graduate WPI with? Check all that apply.

- Actuarial Mathematics
- Aerospace Engineering
- Applied Physics
- Architectural Engineering
- Biochemistry
- Bioinformatics and Computational Biology
- Biology and Biotechnology
- Biomedical Engineering
- Business
- Chemical Engineering
- Chemistry
- Civil Engineering
- Computer Science
- Economic Science
- Electrical and Computer Engineering
- Environmental and Sustainability Studies
- Environmental Engineering
- Humanities and Arts
- Industrial Engineering
- Interactive Media and Game Development
- International and Global Studies
- Liberal Arts and Engineering
- Management Engineering
- Management Information Systems
- Mathematical Sciences
- Mechanical Engineering
- Physics
- Psychological Science
- Robotics Engineering
- Society, Technology and Policy
- Writing (Professional)
- Other: _____

Q4 Which type of organization sponsored your project? Check all that apply.

- Professional or Scientific Organization (e.g. Institute of Structural Engineers, National Science Foundation)

- q National Government Agency (e.g. Department of Energy)
- q Local Government Authority (e.g. Senator, Montgomery County)
- q Private/Semi-Private Corporation (e.g. General Electric)
- q Non-Profit Organization (e.g. Aid to Artisans)
- q Educational Institution (e.g. Worcester Polytechnic Institute)
- q Other (Please specify) _____

**Q5 What is the name of the sponsoring organization that you worked with to complete your IQP?
Please indicate "Other" if your organization is not listed.**

(Select from drop-down list of all sponsors that worked with WPC)

Q6 If you have indicated "Other" Please specify the organization here.

(fill in) _____

Q7 Which of the following most closely fits the project theme of your IQP? Check all that apply.

- q Animal Conservation and Welfare
- q Arts/Culture/Historical Preservation
- q Economic Growth and Development
- q Education
- q Energy Resources
- q Environment
- q Healthcare
- q Organizational Process Development
- q Policy and Law
- q Public Safety
- q Social and Human Services
- q Urban Planning & Transportation Infrastructure
- q Other: _____

Q8 What kind of deliverables did your project produce? Check all that apply.

- q Built Structures or Products
- q Computer Programs or Apps
- q Designs for Built Structures or Products
- q Information Repositories, Databases, Websites
- q New Collaborations and Partnerships
- q New Procedures and Processes
- q Promotional Materials and/or Events
- q Recommendations and Proposals
- q Research Study
- q Training or Educational Materials

q Other: _____

Personal Impact:

**Q9 To what extent do you agree with the following statement in regards to the following areas:
“My IQP experience enhanced my abilities in...”**

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

- Written communication []
- Oral communication []
- Visual communication []
- Teamwork []
- Leadership []
- Defining achievable project goals and objectives []
- Managing time and tasks for a complex project []
- Conducting research using multiple information sources []
- Critically analyzing and evaluating information []
- Generating new ideas and thinking creatively []
- Personal Initiative []

Q10 Can you elaborate on how any of these abilities were affected because of your experience at the WPC?

(fill in) _____

**Q11 To what extent do you agree with the following statement in regards to the following areas:
“My IQP experience changed my awareness/attitude on ...”**

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

- Connections between society and technology []

Global issues []
Ethical responsibilities and impact on others []
Cultural differences and ways of interacting []
The interdisciplinary nature of complex problems []

Q12 If you “Agree” or “Strongly Agree” on any of the above, can you explain what about your experience changed your awareness or attitude regarding that topic?

(fill in) _____

Q13 If you “Disagree” or “Strongly Disagree” on any of the above, can you explain what about your experience changed your awareness or attitude regarding that topic?

(fill in) _____

Q14 If you had the opportunity to change three aspects of your project experience, what would they be?

(fill in) _____

(fill in) _____

(fill in) _____

Q15 What were some of your most memorable experiences outside of your project?

(fill in) _____

Q16 To what extent do you agree with the following statement:

“My IQP experience had a positive impact on me personally”

1 - Strongly disagree

2 - Disagree

3 - Neither agree nor disagree

4 - Agree

5 - Strongly agree

Q17 How did your IQP experience positively affect you?

(fill in) _____

Q18 How did your IQP experience negatively affect you?

(fill in) _____

Q19 To what extent do you agree with the following statement:

“My IQP experience benefited me in my professional career after graduation”

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

Q20 Can you elaborate on how your IQP experience did or did not benefit you in your professional career?

(fill in) _____

Other Impacts:

Q21 To what extent do you agree with the following statement:

“My project made a significant contribution to my sponsor, other organizations, businesses, or members of the community”

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

Q22 To your knowledge, which of the following groups were affected by your project? Check all that apply.

- Sponsoring organization
- Other organizations or businesses beyond the sponsor
- General public/members of the community
- Specific demographic (e.g. teenagers, farmers in Virginia): (fill in) _____
- No groups were affected

Q23 Can you elaborate on any specific positive or negative impacts that your project had on your sponsor or others?

(fill in) _____

Conclusion:

Q24 To what extent do you agree with the following statement:

“I recommend students complete their IQP at the Washington, D.C. Project Center”

- 1 - Strongly disagree
- 2 - Disagree
- 3 - Neither agree nor disagree
- 4 - Agree
- 5 - Strongly agree

Q25 Do you have any memorable stories from your time on IQP? If so, we would like to hear them! These stories could potentially be displayed on the Washington, D.C. Project Center website that our team is currently building, <http://wp.wpi.edu/washingtondc>. If you would rather email us directly, please send them to dc17wpc-media@wpi.edu.

(fill in) _____

Q26 Do you have any photos from your time on IQP that you would be willing to share with us? If you have photos readily available you may upload them here or email them to us at dc17wpc-media@wpi.edu. For proper attribution, please include your name, date, and a short description. Note that any media you provide here may be used for the Washington, D.C. Project Center website, located at <http://wp.wpi.edu/washingtondc>.

(fill in) _____

Q27 In our project report, and in future WPI publications, we may wish to quote directly from some of the responses in this survey. Please indicate your preference in terms of attribution below.

m I agree to being quoted and identified.

m I agree to being quoted anonymously as a “WPC Alumnus” or “former student participating in the WPC.”

m I would not like to be directly quoted in any form.

If in Q27 “I agree to being quoted and identified” is selected, display Q28:

Q28 Please enter your name for quote identification here.

(fill in) _____

If in Q27 “I agree to being quoted and identified” is selected or “I agree to being quoted anonymously as a ‘WPC Alumnus’ or ‘former student participating in the WPC’ is selected, display Q29:

Q29 We may wish to contact you for follow-up clarification on your responses. Would you be willing to be contacted through email?

m Yes (fill in) _____

m No

Q30 Would you like to be included in a raffle for one of three \$50 Amazon Gift Cards? If so, please provide an email address (the email you provide will only be used to notify you if you win the gift card, or if you indicated that you would be willing to speak with us further).

(fill in) _____

Q31 What is your gender?

m Male

m Female

m Other: _____

m Prefer not to respond

Q32 Are you currently living and/or working in the DC area?

m Yes

m No

Q33 If you would like to share a longer testimonial of your experiences, want to elaborate on something this survey did not cover, or have any questions or comments about this survey and the WPC, please don't hesitate to contact us at DC17WPC@wpi.edu!

Appendix J - WPC Alumni Survey Introduction Email

Subject: Please share your experience at WPI's Washington Project Center

Hello Washington Project Center Alumni,

We are a student team at WPI completing our IQP in Washington, D.C. working to uncover the history and assess the impact of the project center over the past 43 years.

For us to be successful, we need your help.

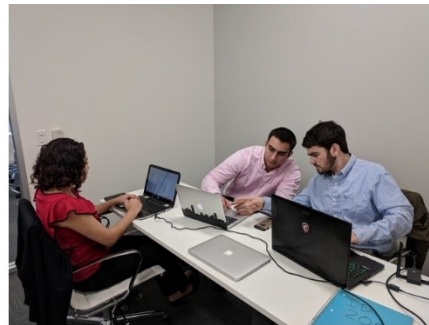
With your experiences and stories we will be able to build an exciting website that showcases your work and our project center. Please take a look at our website - while it's still under construction we'd love to hear what you think! Website link: <http://wp.wpi.edu/washingtondc/>

If you wish to share any of your personal experiences or any media you have from your time in Washington and be featured on our website, please email us at dc17wpc-media@wpi.edu.

Take a look at some of the example pictures below.



Washington Project Center team from 1978



Washington Team in Action - 2017



WPC Team exploring Washington - 2017



Washington Monument- 2017

Would you be willing to take 15 minutes to complete our survey about your time at the Washington, D.C. Project Center? We want to learn more about how the project center has impacted you. By completing the survey you may enter in a raffle to win one of three, \$50 Amazon gift cards.

The survey can be found here: https://survey.az1.qualtrics.com/jfe/form/SV_cGFy5zA4uYVIOst.

We value your feedback and experiences!

Thank you,

WPC Team



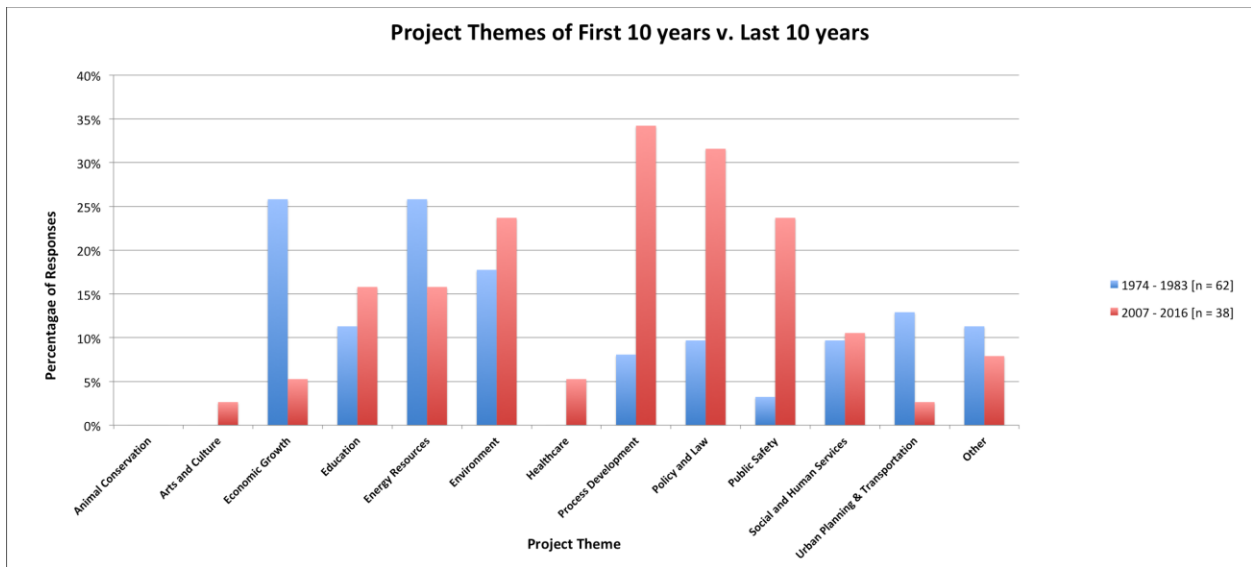
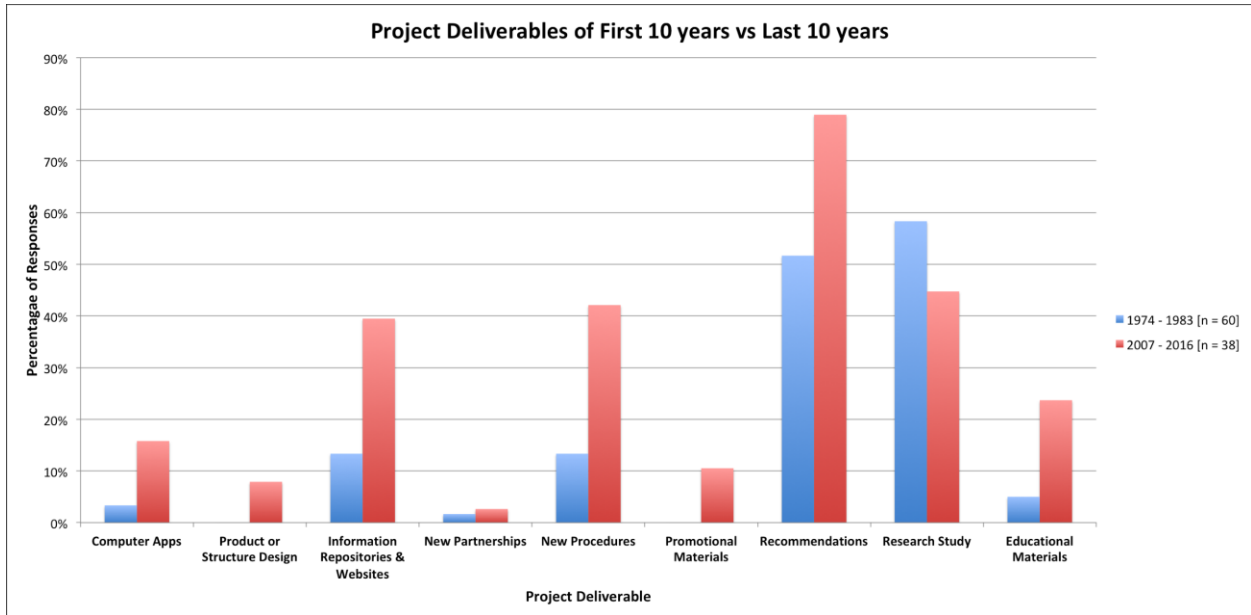
Shown above (Left to Right):

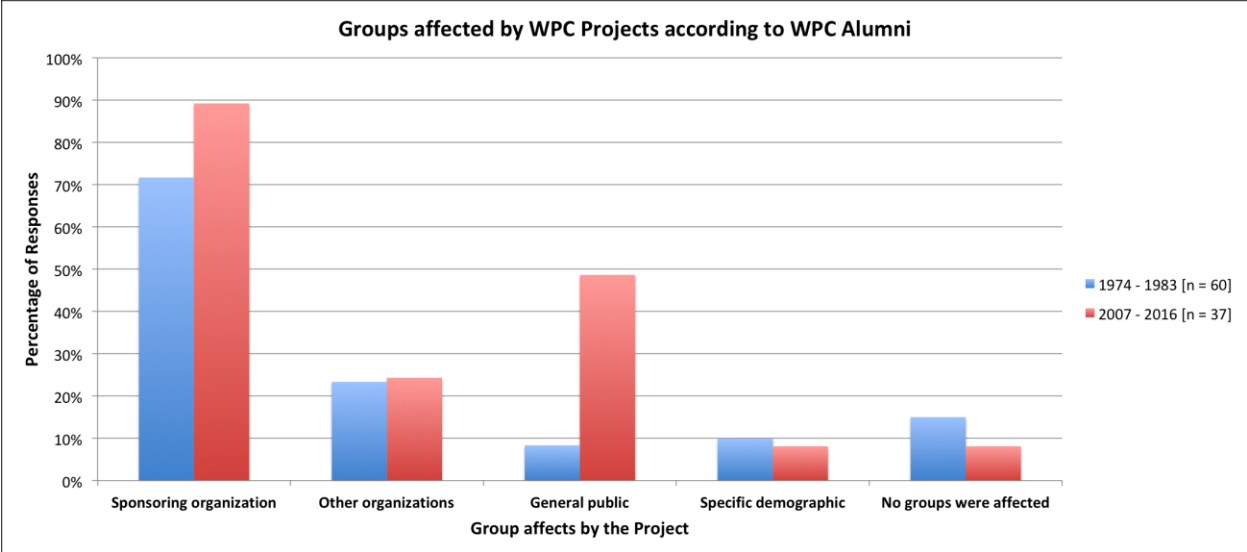
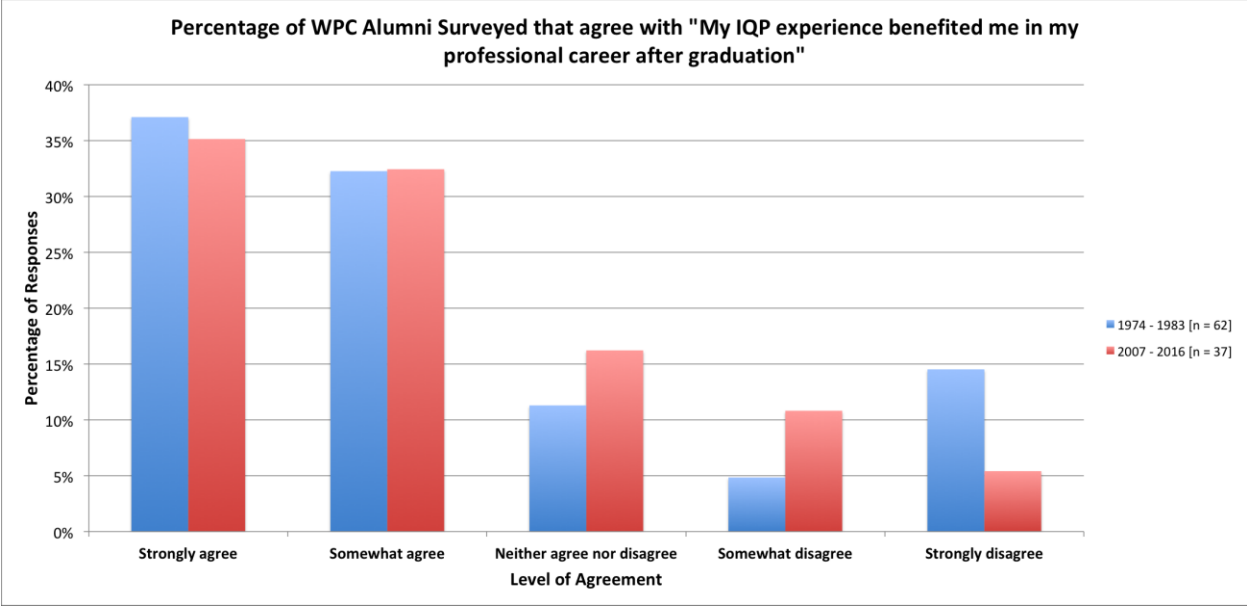
Evan Frost (IMGD), Justin Seeley (ECE), Libertad Escobar (ME), Alex Avakian (ME)

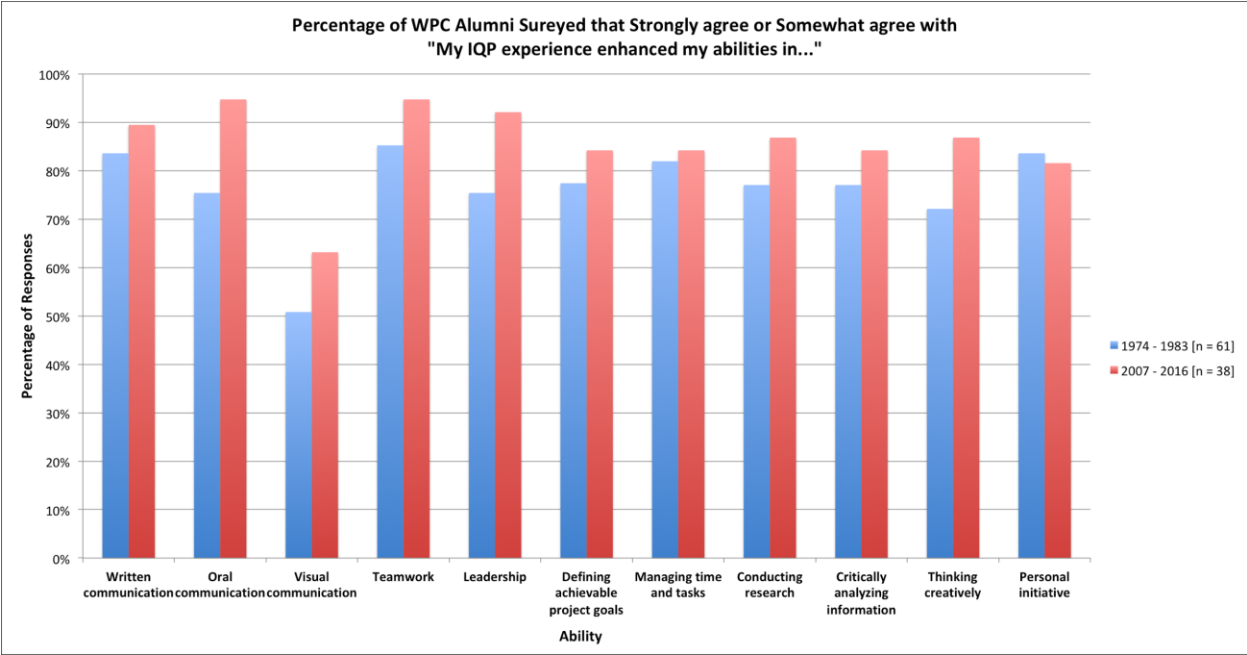
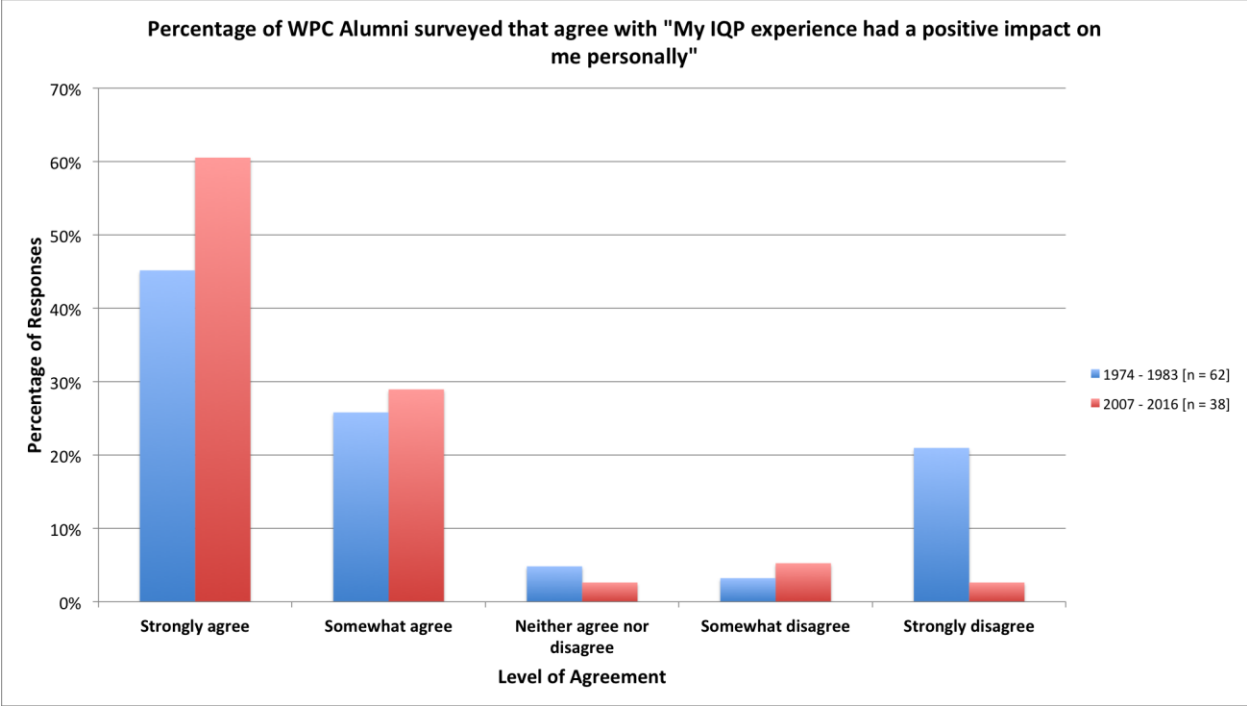
Appendix K - Gender of WPC Alumni Survey Respondents

Q31 - What is your Gender?	
Gender	Number of Responses (n = 183)
Male	137
Female	45
Prefer not to Answer	1

Appendix L - Past vs. Present WPC Alumni Responses on the WPC







Appendix M - Authorship Page

Section Number	Section Title	Author	Reviewer
1.0	Introduction	Alex, Libertad	Evan, Justin
2.0	Background	Justin, Alex	Libertad
2.1	Establishing the WPI Plan	Alex	Libertad
2.2	History of Washington, D.C.	Evan	Justin
2.3	The Washington, D.C. Project Center	Justin	Alex
2.3.1	Students First Concerns about the Project Center	Justin	Alex
2.4	WPC Record Keeping	Libertad	Evan
2.5	Defining Impacts	Alex	Justin, Libertad
2.5.1	Impact Models at WPI	Alex	Justin
2.5.2	Other Models	Justin	Libertad
2.5.3	The Impact Model	Libertad	Justin
2.6	Learning from other project centers	Libertad	Evan
2.6.1	Project Center Websites	Libertad	Evan
2.6.1.1	London Project Center (LPC)	Libertad	Evan
2.6.1.2	Melbourne Project Center (MPC)	Libertad	Evan
2.6.2	Similar IQP Projects	Libertad	Alex
2.6.2.1	London Project Center Impacts Team One	Libertad	Alex
2.6.2.2	Melbourne Project Center Impacts Team One	Libertad	Justin, Alex
2.6.2.3	Melbourne Project Center Impacts Team Two	Libertad	Justin
3.0	Methodology	Alex, Justin	Evan, Libertad
3.1	Mission Statement and Objectives	Evan, Justin	Alex

3.2	Creating an Impact Model to Guide an Investigation on Impact	Justin	Libertad
3.3	Conducting Interviews to Collect Qualitative Data on the Impact of WPC Projects	Libertad	Justin
3.4	Conducting WPC Alumni Survey to collect Quantitative and Qualitative Data on WPC Projects	Justin	Alex, Libertad
3.5	Compiling Database of Past Students and Projects at the WPC	Evan	Justin
3.6	Creating a Website to Document the History and Impact of the WPC	Alex	Evan, Justin
4.0	Findings	Justin	Evan
4.1.0	Interviews	Libertad	Justin
4.1.1	Advisors Interviews	Libertad	Justin
4.1.2	Sponsors Interviews	Libertad	Justin
4.2.0	WPC Alumni Survey	Justin	Libertad
4.2.1	Characterizing the Population	Justin	Libertad
4.2.2	Overall - Likert and Demographic	Justin	Libertad
4.2.3	Overall - Open-Response Answers	Justin	Libertad
4.2.4	Comparing the First 10 Years to the Last 10 Years	Justin	Libertad
5.0	Outcomes/Accomplishments	Justin	Alex
5.1	Database	Evan	Justin
5.2	WPC Website	Alex	Libertad
6.0	Recommendations	Libertad	Alex, Justin