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**An Analysis of Distance Advising at WPI**

Report Submitted to:

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This project report is submitted in partial fulfillment of the degree requirements of Worcester Polytechnic Institute. The views and opinions expressed herein are those of the authors and do not necessarily reflect the positions or opinions of Worcester Polytechnic Institute.

This report is the product of an education program and is intended to serve as partial documentation for the evaluation of academic achievement. The reader should not construe the report as a working document.

## *ABSTRACT*

The goal of this project was to evaluate distance advising at Worcester Polytechnic Institute. To reach this objective the project team observed the Australia project groups throughout the 1999-2000 academic year. The data collected supplied insight relevant to the advising style of Professor Jonathan R. Barnett, also the advisor of the Australia projects. This allowed the authors to evaluate numerous aspects of distance advising from an objective point of view with the hope of making significant recommendations for the future.

## *AUTHORSHIP PAGE*

The IQP team was responsible for the write-up of the entire IQP report. Each member was involved in the research, discussion, and the resulting written output. However, for convenience purposes, each group member was responsible for various sections of the final documentation. Christopher Ferreira was responsible for the Methodology and Conclusions sections of the report. Derrick Morse was responsible for the Literature Review section of the report. Matthew Daelhousen was responsible for the Analysis and Results section of the report. Finally, the Executive Summary, Introduction, Recommendations, and all other sections of the report encompassed a collaborative effort of the project team.

## *ACKNOWLEDGEMENTS*

The IQP team spent many hours establishing and completing this project. The authors exerted much effort in order for the project to be a success. However, the project would not have been successful without the help of many other individuals. Personal thanks are extended to Prof. Jonathan Barnett, Associate Professor of Fire Protection Engineering at WPI, for introducing the project to us. As the advisor, he also offered much assistance throughout the completion of the project.

We would also like to thank Pennie Turgeon, the director of the Instructional Media Center at WPI. As the director of the IMC, she was in the position to offer many initial suggestions regarding the direction our project should take. She gave us several resources that enabled us to get the project underway. Judith Miller, Professor of Biology and Biotechnology at WPI, is also knowledgeable in the area of distance advising. She was able to provide us with resources and recommendations as well.

Finally, we wish to thank the C-term Australia MQP groups and the D-term Australia IQP groups for assisting us in the completion of this project. Without these teams, the project would have never taken place. These groups allowed us to observe their progress and relationship with their project advisor, and in doing so, were the main source of our results and recommendations.

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## *1.0 EXECUTIVE SUMMARY*

It is anticipated that in the near future, distance advising will be fully integrated into Worcester Polytechnic Institute's curriculum. Currently, however, an official program has not been developed. Therefore, it is necessary to determine the various advising techniques and new technologies that could benefit such a program. In order to improve the study abroad experience, the available communication technologies and personal advising interactions were researched. General advising techniques were scrutinized and understood so that they could be utilized in a distance-advising situation.

After the authors developed a general understanding of these principles, several project teams were evaluated in an attempt at assessing the effectiveness of these principles. The students traveling to Australia during C and D terms of 2000 were chosen as the interest groups of this study. There were four MQP groups studying in Australia during C term, and three IQP groups during D term, each advised from a distance by Prof. Barnett.

The C term groups served as a control group. The project team observed their progress and their relationship to Prof. Barnett throughout the term. A major source of data for evaluating their performance involved qualitative and quantitative surveys and responses. An initial survey was given to the students to gain an understanding of their expectations, progress, and opinions. In addition to the initial survey, the project team consistently corresponded with the students abroad via email. This correspondence allowed the authors to act as a third party between the students and Prof. Barnett. The students, therefore, felt more comfortable in expressing their concerns without the fear of compromising their relationship with Prof. Barnett. At the end of the term, a final survey

was issued. The results of this survey allowed the project group to differentiate between Prof. Barnett's personal advising deficiencies and the difficulties caused solely by the distance advising situation. The students' final comments on the distance advising situation also allowed the authors to make general recommendations for future project groups.

After observing the circumstances and issues encountered by the C term MQP groups, the authors took a more active approach in implementing adjustments and suggestions to the D term IQP groups. Throughout D term, the project team followed a similar observational procedure with these IQP groups, using initial surveys, frequent interaction throughout the term, and a final survey. However, through a proactive approach, the authors attempted to combat any issues that arose during the term. The team was able to identify problems with the new implementations, and consider further problems that may need to be addressed.

This procedure allowed the authors to develop a resource for distance advising. The team was able to determine all of the necessary components for distance advising to be successful. Although it was recognized that distance advising is far from ideal, the authors made suggestions to improve future distance advising situations. Various advising methods were developed, and several technologies were suggested to improve the relations between the students and the advisor.

Although a sincere effort was made by the authors to improve distance advising at WPI, the steps taken to reach the project's conclusions are not necessarily ideal. First, the authors only analyzed two sets of data, the C term groups and D term groups. In each set, there were only three and four groups participating, respectively. This small sample

size does not allow for a broad range of data and general opinions on the part of the students. Secondly, both of these groups completed projects in Australia. Therefore, the authors were unable to evaluate distance advising at various project centers. Different project centers present varying atmospheres and conditions that could affect distance advising. Another crude aspect of the project is the observation of only one advisor. The authors are grateful that Prof. Barnett allowed the team to study his distance advising techniques, but again this is an inadequate representation. Different advisors employ a variety of advising techniques, which can both benefit the situation yet also create difficulties. Working with only one advisor, it was difficult to obtain other perspectives. Finally, Prof. Barnett is also this teams local project advisor, which creates somewhat of a conflict of interest. The authors are studying his advising of project groups at a distance, observing his capabilities, and documenting them. Simultaneously, Prof. Barnett advised the authors and evaluated the final presentation, leaving room for bias.

It is unfortunate that the project team was unable to improve on the circumstances of this project. Although the conditions of this project were not necessarily optimal, the authors feel they made an objective assessment. Based on the analysis of the MQP and IQP groups, the project team made recommendations for consideration by future advisors and project teams. The authors are confident that in the future, this project can be continued and expanded to include a variety of project groups, locations, and potential advisors.

## *2.0 INTRODUCTION*

Worcester Polytechnic Institute requires students to complete a rigorous curriculum that differs from the majority of other institutions in the country. Included in this curriculum are three projects, which are designed to foster the student's professional capabilities by giving them the chance to apply their education to practical matters. The first of these projects is the Sufficiency, where a student demonstrates their proficiency on a subject regarding Arts and Humanities by studying and reporting on a topic outside of their major area of study. The second is the Interactive Qualifying Project (IQP). This project "challenges students to identify, investigate, and report on a self selected topic examining how science or technology interacts with societal structures and values (WPI Undergraduate Catalog 1999-2000)." The third and final project, the MQP (Major Qualifying Project), is a culmination of the student's academic career. The student must apply the skills, methods, and knowledge of his or her discipline to solve a problem representative of the type to be encountered in his or her career.

Project centers across the country and overseas enable students to complete their projects away from WPI. These project centers give students the opportunity to study abroad by working on their IQP and/or MQP in a different atmosphere. IQP or MQP project centers have been developed in such places as Washington D.C., San Francisco, Africa, Australia, London, Denmark, Germany, Italy, Costa Rica, Puerto Rico, and several other countries.

Although students are given the opportunity to complete a project abroad, they are faced with a greater responsibility of communication with their host institution and

advisors as well as establishing and completing goals on-site. This opportunity, if not well orchestrated, can lead to a frustrating time in which communications issues dictate their performance on the project at hand. Students who participate in a distance-advising situation are particularly subject to such issues, as they must maintain communication on campus as well as with their sponsors abroad.

The unfortunate result in this case, is that students might not have the most enjoyable experience. Distance relationships often tend to foster a gap in communication. When an advisor can locally counsel a project group, he or she can give them immediate attention. There usually no confusion regarding what the advisor is requesting or expecting of the project group, and if there is, the problem can be solved instantly through a simple meeting. The project groups communicate with their advisor directly, not through a third party.

With distance advising, the opposite is true. It is not uncommon to encounter vast confusion between students and the advisor. It is often hard for students to get in touch with the advisor; therefore a simple question might take several days for a response. This can result in a lack of sufficient progress, and can lead to animosity between the two parties, even though it is not necessarily either side's fault. This confusion and lack of communication can lead to a poor overall experience for the student, and in some drastic cases, can affect the project's outcome and evaluation.

These are very awkward conditions for both the advisor and the project groups to overcome. In addition, an even more unfortunate fact is that there are new available technologies and definitive advising techniques that can be employed to reduce these difficulties, but they are usually not employed. Although it is clear that these

technologies and procedures can greatly improve distance communication, limited research has been done regarding how to implement them into WPI's project system.

This project, therefore, focuses on evaluating distance communication, with an emphasis on overseas project advising. There are many new technologies available that many are aware of, yet few understand how to properly apply them for use in a distance-advising situation. There are also many advising techniques and procedures to follow to ensure an optimal experience for both the students and the advisor. An evaluation will be developed for future advisors to follow, so that misunderstandings, miscommunications, and frustrations may be minimized.

In an effort to evaluate the performance of Prof. Barnett and his advisees in Australia throughout the spring semester of 2000 this project team implemented a program to track and offer objective insight into the advising style of the advisor as well as issues faced by the advisees. The authors are used their influence as fellow class mates of the students abroad to improve the distance advising situation by pointing out areas of weakness or strength for future improvement. The recommendations of this project have been tracked and evaluated by the project team as part of this project.

## 3.0 LITERATURE REVIEW

## 3.1 CURRENT AVAILABLE TECHNOLOGIES

### 3.1.1 Communication Methods

The world of communications technologies has changed dramatically in recent years, as the telecommunications field no longer consists of simple telephone calls and faxed memorandums. In the modern business world, time has become synonymous with money, and communication is an essential factor in the success of any sized partnership or corporation. The continual growth and especially the geographical expansion of many businesses have driven communication technologies to new heights. Advancements in computer technology and the development of the Internet, and vast improvement in communication software have all dramatically changed the communication technology field and each are integral components in today's methods of information transfer.

These advancements harbor the development of new communication methods; specifically Internet based methods that have grow tremendously in recent years. Major advantages of these new forms of information transfer and communication include their ease of use, wide spread acceptance, and continual growth. "Universities – large and small – are starting to implement the technologies of the Web and e-mail for on campus learning." (Boettcher) The use of modern forms of efficient communication is spreading rapidly, allowing not only corporate executives, but also average students to utilize them. On campus communication is also constantly improving, and "in fact, some universities are questioning whether it makes sense to differentiate between residential instruction and instruction at a distance." (Boettcher)

The Global Opportunities office at Worcester Polytechnic Institute coordinates the completion of professional level projects away from the WPI campus. These projects, in combination with the availability of the project sites provided by Global Opportunities worldwide, create an environment that is conducive to testing and utilizing a number of various communication methods.

In past years most project advisors have been on site with their respective IQP or MQP students. However, the continual growth of the global opportunities office (WPI's Interdisciplinary and Global Studies Division Updates site), and the expansion of the project sites has made it harder than ever for an advisor to travel with their students. This increasing popularity in studying abroad has made on site advising nearly impossible in some cases. Due to time constraints as well as other personal conflicts, oftentimes the advising faculty simply cannot leave the school or country for a seven-week period (Barnett). The advisor's inability to be on site with his or her students should not affect their project success however, and in order to prevent this from happening, clear and efficient lines of communication must be kept open and utilized frequently. Past distance advising experiences have been near disasters simply due to a lack of communications (Appendix B). However, with current communication technologies project success rates can increase dramatically.

### *3.1.2 Technology Characteristics*

Various important factors that need to be taken into consideration when choosing various forms of distance communication include:

**Time differences**: with WPI students traveling to countries halfway around the globe the ten to fourteen hour time difference makes real time communications extremely difficult.

**Available foreign technology**: many countries are not as technologically advanced as our own. One cannot assume the same equipment, support, etc. will be available abroad.

**Expense**: Distance communication can be extremely expensive. A simple phone call from some sites may exhibit a tremendous financial burden.

**Expression**: some forms of communication lend themselves to personal interaction and expression, while the formality of others seems to get in the way.

Considering the above factors there are a number of traditional and contemporary forms of distance communication technology available that may or may not be beneficial to a distance advising experience.

## *3.2 COMMUNICATION TECHNOLOGIES.*

### *3.2.1 International Telephone Communications*

Perhaps one of the most traditional forms of long distance, international communication is the international telephone call. Some of the advantages of the telephone include: availability, ease of use, and its interactive nature. The popularity of the telephone worldwide all but guarantees the availability of this personal communication device almost anywhere in the world. It is extremely easy to use, and once both parties are on the line together it does not matter how far apart they are geographically. A telephone connection allows the advisor and student to interact more

freely than almost any other form of distance communication. They can interact and cooperate a great deal on a professional level.

Despite these advantages of telephone communication, there are numerous down sides as well. It is extremely expensive and can be quite limiting, not to mention the confusion invoked by any sort of time difference. Telephone rates vary from country to country, but rates from just Worcester to Europe can be as high as several dollars per minute (MCI WorldCom One Rate International Rates site).

One major limiting factor of the telephone is that it is purely vocal. In order to get a point across it must be described accurately and clearly, a task that may not be so easy under demanding circumstances. The last problem is that of time differences, and is encountered whenever the advisor and project groups are at a substantial distance apart. The time difference challenge could easily be solved with the use of voice mail, but sacrifices the interactive advantages of the telephone.

### *3.2.2 Electronic Mail (email)*

Another simple form of distance communication is the use of email. Email has a number of advantages over telephone communications, as well as a number of shortcomings.

Among the advantages of email are its cost, speed, ease of use, and its versatility. Email is a widely used; Internet based method of quick, free communication over short or long distances. It is an asynchronous communication method, in which participants need not be online at the same time. This is a major advantage, and has aided in its successful implementation across the globe (Barone). Email is also familiar to virtually all students, and is easy to use quickly and efficiently. Using email, a student at a foreign project

center can instantly inform their advisor of their progress or a potential problem, with either a quick note or a long description of the exact circumstances. The ability to attach files is helpful, and using email eliminates the time difference problem by allowing the advisor or students to respond at their earliest convenience. This versatility makes email a desirable tool of distance communication.

Despite all of the above advantages there are some problems with email as well. The student's inherent familiarity makes it a more relaxed form of communication. This in combination with the fact that it is not real time presents a few minor issues. Students and/or advisors might not respond to emails in a timely manner, whether on purpose or simply due to the situation. Email messages can also be misleading. The lack of real time discussion creates a potential for ambiguous information that might require further clarification. The user might also write in an ambiguous manner on purpose without fear of being questioned. Without simultaneous questioning and professional cooperation the project might not be accomplished to its full potential (Barnett).

### *3.2.3 Internet Chat Programs (ICQ, AOL-IM)*

Between the use of international telephone calls and the use of email, is the contemporary means of real time interactive communication. The use of Internet based chat programs has become widely accepted as an easy to use tool for communicating with friends and relatives, however it has potential for use in far greater fields. When using an Internet chat program, the user has the ability to receive instant alerts, send instant messages, share photos, pictures and sounds, in addition to enjoying the benefits of live conversations online, for free (AOL Anywhere Instant Messenger® information site). The popularity of these types of programs with students as well as some advisors makes

it extremely easy to implement for advising purposes. Internet chat programs are inexpensive, easy to use, user friendly, and like the telephone they are interactive. The advisor and the student can discuss project topics in detail, debating back and forth until a compromise is made or a solution is found.

One of the few disadvantages to Internet chat programs is that they are primarily text based. Although some have the ability to attach and send files, for the most part any desired communications must be manually typed, in real time, via the use of a keyboard. This obstacle might be substantial depending on the user's typing ability and speed, however it is generally not difficult to overcome. The last substantial drawback to an ICQ type program is the reoccurring problem of time differences. This issue develops during the use of any real time communication method, however, and must be resolved by scheduling.

### *3.2.4 Videoconferencing (non-web based)*

In distance learning and advising environments, "The ability for live on-air interaction with an instructor was the second highest rated item, surpassed only by the need for adequate library resources (Threlkeld)." Video conferencing provides an ideal tool, which if utilized correctly ensures this much needed interaction. It is an extremely efficient communication tool that is frequently used in distance learning situations. This innovative technology creates a social atmosphere and promotes interaction between students and faculty. The ability to communicate face to face in real time with another party is as close to on site meeting as possible. The importance of this interactive quality in distance communication has already been stressed. Video conferencing takes this to a new level with live audio and video feeds. The live audio and video allows users to

interact freely with each other, conveying their points with clarity and precision. The ability to use body language and diagrams in addition to live audio helps tremendously in expressing an exact point and sharing ideas. The potential of using video conferencing is great, but its bulky, expensive setup greatly hinders its use.

Although commonplace video conferencing is an extremely efficient form of distance communication, the hardware requirements of a videoconferencing system are significant. Video cameras, CODOC monitors, as well as TV monitors and audio delivery units are required for a base video conferencing system. In order to introduce additional audio graphic technologies into the system, telephone lines, modems, computers, graphics tablets with light pens, as well as audio and data bridges are required. The demanding requirements and cost of a full video conferencing system are substantial. However, the principles behind video conferencing are promising.

### *3.2.5 Web Based Videoconferencing*

Web based videoconferencing utilizes all of the concepts of regular video conferencing, but limits the required hardware to a PC, a camera, a microphone, and an Internet connection. The cost of web conferencing software is very low and even free in some cases, due to the large number of competing software companies. A web conferencing system is so easy to set up the average student can do it quite quickly. In addition to the hardware, cost, and ease of use advantages of web conferencing over video conferencing, there are a number of added features included this relatively new technology.

Depending on the software, web conferencing can be set up and conducted in a site-to-site (unicast) manner, or by linking more than two computers together to create a

multicast system. With a multicast system numerous people can communicate in real time, face to face regardless of geographical hindrances. Although a valuable feature, there is minimal use for multicast calls in the field of distance advising. The desired function of web conferencing in distance advising is its one on one interactive nature as well as its numerous other features.

One useful feature of web conferencing is the whiteboard function. The whiteboard is primarily a virtual chalkboard, allowing its users to create, review and update graphical information in real time. Text, graphs and pictures can be cut, copied, and pasted from any Windows applications, and manipulated prior to or during the meeting. In most software packages different user's contributions to a whiteboard are shown in different colors and are easily distinguished. The whiteboards from a meeting can also be saved for future reference, or loaded during a meeting, saving time by allowing the users to prepare earlier.

The chat feature included in many web conferencing packages is also a useful tool. Chatting allows participants in a meeting to write text messages back and forth to each other, and to others throughout the course of a conference. Many software packages include a whisper mode, which allows two users to communicate using the chat feature, while excluding other participants in the meeting. The contents of these text messages can also be saved for future reference. Additional benefits of the chat feature include its aid in the initial setup of a meeting, when different preferences and options may need to be changed before the users can communicate by other means.

File transfer is yet another useful feature included in most web conferencing software packages. The file transfer feature allows participants in a meeting to send files

to all persons involved in the meeting. It also allows users to choose to send a file to particular recipients or to everyone. Moreover, when a file is sent the receiving participant is prompted as to whether they want to accept or reject the file.

Program sharing is a complex but potentially useful tool in web conferencing. Program sharing allows users to share desktop applications easily with the aid of a number of specialized features. First, shared applications are framed to allow easy distinction from local applications. They can be minimized individually if a particular participant does not need to work in the current application, and the currently shared programs can be changed quickly and easily using the shared program taskbar provided by most software packages. Other features of file sharing include choosing to allow only one user to work at a time, approving or refusing a participant's work, and allowing or preventing certain users from working in the shared program by choosing the appropriate option in the shared dialog box.

The last popular feature of most web conferencing packages is advanced calling. This feature allows users to send mail messages to a web conferencing user or to initiate conferencing calls directly from a mail address book
(Microsoft Windows NetMeeting features site, CuSeeMe Home Page, VocalTec™ Home Page)

### *3.3 Academic and Project Advising*

In order to examine the difficulties present in advising a group of students overseas, it is first necessary to understand the various aspects of general academic advising. Upon arriving at his or her institution of choice, the student is faced with many

decisions and situations, which are perhaps new and unclear. Students must have someone to turn to for answers to questions and for guidance throughout their college careers. This assistance usually comes in the form of an academic, or faculty advisor. This professional relationship provides the student with attention, help, advice, information, and encouragement.

Morris Zelditch describes the academic advisor having a more personal relationship with the student, saying,

> Mentors are advisors, people with career experience willing to share their knowledge; supporters, people who give emotional and moral encouragement; tutors, people who give specific feedback on one's performance; masters, in the sense of employers to whom one is apprenticed; sponsors, sources of information about and aid in obtaining opportunities; models, of identity, of the kind of person one should be to be an academic. (Zelditch, 2)

While it is ideal for students to have a close professional and personal relationship with their advisor, this does not always happen. However, the advisor must at least provide certain support. There is no set formula for such guidance, although there are several standards that should be followed. Quality advisors have the ability to share experiences, wisdom, and technical expertise. "They are good listeners, good observers, and good problem solvers. They make an effort to know, accept, and respect the goals and interests of a student. In the end, they establish an environment in which the student's accomplishment is limited only by the extent of his or her talent (Zelditch, 2)."

Advisors must possess the ability to be objective in their evaluation of the advisee, especially if the student is enrolled in one of their courses. Although advisors might share a closer relationship with their advisees, they cannot let this interfere with their objectivity. Another aspect of quality advising is availability and approachability. A good advisor is one who the student feels comfortable seeking advice from, and who is

generally accessible for this advice. While advising students is not the advisor's only responsibility, this is not an excuse for being unavailable to the student. Effective advising does not usually require large amounts of time if the advisor is observant and experienced. Within minutes, the advisor can usually make a suggestion or comment to influence the student (Siegel, 140-144).

There are also many other factors for advisors to consider when dealing with their students. Advisors must be careful, patient listeners, allowing students the time to express their problems, and to ensure that these circumstances are understood entirely. Advisors must not abuse their authority or become overbearing. The student is there to obtain advice, not to perform personal tasks. Advisors must also ensure that they are not controlling the student's behavior, allowing for independent development. The intent of advising a student should be to encourage personal and educational growth, not to make choices for them outright. Finally, when meeting with a student, advisors must avoid interruptions by visitors or phone calls. The objectives of advising the student will not be met if constant interruptions occur (Siegel, 142).

Worcester Polytechnic Institute has recognized the importance of an advisor throughout a student's career. The school has presented the previously mentioned techniques to their faculty. These ideas are formally accessible as part of WPI's website (WPI's Office of Academic Advising On-Line Handbook).

### *3.3.1 Active Advising*

While all advising requires similar qualities as well as objectives, there are certain aspects that can vary between advisors. For example, one of the more popular forms of academic advising is what is known as active advising. This requires much enthusiasm

and organization on the part of the advisor. In this case, the advisor does most of the planning, and initiates much of the interaction with the student. Through regular contact with students, advisors can anticipate problems before they become serious. Active advisors do not assume that the only students who need help are those who ask for it, and seek to interact with the students on a regular basis (Zelditch, 22).

### *3.3.2 Passive Advising*

Another style of academic advising is passive advising. Again, the principal objectives of the advisor remain the same, while the style varies slightly. In this case, the initiative to obtain assistance becomes the student's responsibility rather than the advisors. If there is a problem or issue, a student can seek out the advisor for help. However, the advisor assumes that if the student is not asking for help, it is not needed, giving the student much freedom to develop. Unlike the active advisor, the passive advisor does not usually initiate any form of meeting with the student, and instead waits for the student to ask for guidance.

Most academic advisors apply a combination of active advising and passive advising. They allow the student necessary independence to choose various destinations, while at the same time offering suggestions. They might wait for the student to initiate most of the contact, but still have scheduled meetings periodically. Whatever the case may be, both active and passive advising are both sufficient means to stay in contact with the student on campus.

Although these descriptions are designed for general academic advising, they can be applied towards project advising as well. While individual projects sometimes involve several students and only one advisor, the advisor still needs to be prepared to apply

many of these same tools. Whether choosing to be active or passive, the advisor still needs to be direct, a good listener, and objective, as well as maintain the other aforementioned attributes in advising the project (Zelditch, 34).

### *3.4 Interviewing*

While the authors did not intend to conduct any interviews, it was necessary to obtain some general knowledge in order to communicate with other project groups. The authors felt that by reviewing interviewing skills, corresponding with the other groups would be much more successful. The results of this research are presented in Appendix A.

## *4.0 METHODOLOGY*

The primary objective of this project was to evaluate the techniques employed through distance advising by collecting quantitative and qualitative data. After the data had been collected, a secondary goal was to make recommendations for more efficient and effective advising techniques in these distance applications. In evaluating the distance advising techniques, the project team compared the results and effectiveness of their on-campus advising situation to that of the off-campus teams, revealing the major disadvantages of the off-campus project experience with respect to the advisor.

This project focuses on two specific sets of project groups, the C term 2000 Australia MQP students and the D term 2000 Australia IQP students, all advised or co-advised by Prof. Barnett. The MQP students served as a test group; which the authors tested their evaluation techniques on this group and monitored their progress and concerns throughout their term abroad. The IQP students, on the other hand, served as the team's focus group. The results of the MQP surveys and consistent concerns were used to shape the IQP student's PQP, process thereby better preparing them for a successful project experience.

In order to accomplish their primary objective, the project team conducted surveys with the two groups that studied in Australia during the C and D terms of 2000. The initial surveys were conducted prior to the students' departure for their project sites, during the PQP process. A survey was formulated aimed at collecting both quantitative and qualitative data through a process of quantifying an answer then elaborating through a potential explanation. This gave the project team the opportunity not only to retrieve numerical results to their inquiries, but also to attain some qualitative data from which to

make recommendations in educating and preparing the students for their academic endeavor.

After analyzing the data from the surveys and the constant communication via e-mail, the team then made recommendations to Prof. Barnett regarding the direct feelings and concerns of specific MQP or IQP groups. This better allowed him to take corrective measures to reassure the overseas students about their objectives or to take administrative actions. The results of the MQP experiences, both socially and academically, then guided the team in recommending proper issues to advise the IQP students prior to their departure to Melbourne. This allowed Prof. Barnett to more effectively train these students in areas in which the MQP groups lacked success and proficiency, namely communication.

Throughout the process of training and evaluating the two groups, the authors also compared the distance advising experience and concerns to their own on-campus experience. Evaluating the dynamics and differences between the two relations proved to be key to reevaluating the distance advising techniques employed. Relating their own concerns to those faced abroad helped Prof. Barnett reconsider potential solutions to situations and most often techniques to avoid any future altercations.

## *4.1 Surveying*

### *4.1.1 Initial Survey*

After research in the field of interviewing and surveying the authors formulated an initial survey that addressed available communication technology, distance advising, and some personal concerns. The same survey was distributed to both the C term MQP

project teams and the D term IQP teams, during their PQP process (See Appendices A and C). The survey not only served as a brief familiarization tool for the project teams' knowledge, but also to guide the advisor on initial concerns that the students may have encountered throughout the PQP process. The document itself integrated both qualitative data as well as quantitative questions in an even ratio.

After a brief introduction to the project goals of each student, the survey then focused on that particular student's previous experience with available technology for distance communication. Being a major factor in the success of projects abroad, communication proved to be an important issue. The evaluation tool rated the individual's ability on a variety of potential communication opportunities ranging from international telephone calls to WEB conferencing. This was done on a quantitative scale so as to gain generalized group proficiency on each technique. This portion of the survey also included quantitative data regarding the amount of direct contact (real time) with Prof. Barnett the students would prefer while away, and a rating on how their present PQP meetings had generally faired.

Qualitative data from this section mainly addressed the amount of contact time necessary for the project's success. Through direct questioning relating to set office hours and direct contact time, the project team was able to gather the students' feelings on the relative level of importance of these issues. The survey also addressed the students' perspective on the productivity of their weekly PQP meetings with Prof. Barnett. This information became valuable in conveying their reactions and feelings to Prof. Barnett as well as guiding his PQP program.

The last issue the survey addressed in its second section was technological concerns in communicating at a distance. More often than not, students are not familiar with performing at a distance. Sheltered by the technological capability of WPI's campus, most students took advantage of the ease of Internet access or technology available at their home institution. In traveling abroad, especially to Australia, one cannot anticipate any certain communication capabilities, other than relatively expensive international calling. This issue raises particular concern with both the students and advisors. From these results, the project team made recommendations on how to better prepare the individuals to successfully communicate with Prof. Barnett. These results will also benefit subsequent project groups and their distance advisors.

Distance advising served as the topic of interest in the third portion of the preliminary survey. Here, the students qualitatively rated their advisor, Prof. Barnett, on the following issues: listening skills, flexibility, IQP related expertise, project management skills, availability, objectivity, and guidance toward achieving project objectives. They also rated him on his attitude and capabilities. Qualitatively, the students were offered the opportunity to clarify any of their quantitative answers in the survey as well as comment on their advisor's assistance in organizing their project as well as the journey to Australia.

The final section of the survey was included for interest only. Focusing on personal concerns and issues, this opportunity allowed the project team to focus on more personal concerns from the student's perspective. Defining any possible limitations, concerns, or a time breakdown allowed the authors to inform Prof. Barnett about student expectations abroad as well as the ability to compare their input and expectations to his.

It also afforded the project team the opportunity to inform him of any overlooked concerns that may have arisen.

### *4.1.2 Pre-Testing the Initial Survey*

After refining the initial survey with Prof. Barnett, the authors tested the survey and its results with the test group, the C term 2000 Australia MQP project teams. The results were provided in an anonymous fashion to Prof. Barnett, and were therefore limited to only general suggestions. This survey was conducted during a PQP session normally scheduled with Prof. Barnett. The students were given as much time as necessary. Prof. Barnett also provided them with exclusive privacy by leaving the session early for the authors to administer the survey in his absence. This certainly gave the MQP groups the opportunity to express their honest opinions and concerns without feeling pressured by their advisor.

In testing the initial survey the project team did, however, realize that this group did not provide sufficient evidence to support relevant claims for improving all projects abroad. The results were case specific to the Australia project program and did not reflect the thoughts and concerns of other Global Opportunity Program project groups. It did, however, serve as a direct reflection on Prof. Barnett's advising capabilities with respect to the Australia Project Program. For this reason the authors maintain their results to be case specific and serve only as a reference for other Global Opportunity Program advisors in the future.

### 4.1.3 Return Survey

In formulating a basis for reviewing and evaluating the overseas project experience, in particular distance advising as a whole, the project team developed a final survey administered on the students return to WPI (See Appendix E). The survey addressed more qualitative issues than the initial survey. The authors sought to observe general impressions involving Prof. Barnett's distance advising experience, as well as address any key issues directed by the individuals completing the survey.

Rather than direct the students' thought process through formulating quantitative questioning, the authors opted to allow a free thought process evaluation by directing generalized questions such as, "Disregarding the personal limitations of your advisor, how do you feel the distance limited your success (MQP Return Survey, Appendix E)?" By doing so, they offered the students the opportunity to respond in a relatively unbiased manner. The project members received far better results, qualitatively, by extending this psychological initiative to the persons being surveyed. It allowed time to express intentions and formal recommendations that otherwise may have been lost in specific questioning. In doing so the authors were also able to attain a much broader spectrum of opinions in the results.

### 4.1.4 Distributing the Return Survey

Distributing and collecting the return survey from the MQP teams proved to be a relatively easy task. After developing the survey, the team sent a general email to the C term Australia MQP alias, set up by Prof. Barnett (OZMQP@wpi.edu), and attached the survey as a Word document file. Those who chose to complete it electronically were able to do so and submit it back to the authors via email. Extra surveys were also printed, for

convenience purposes, and made available to those students who could not submit them electronically. The authors placed a pick-up and return box in the Fire Protection Engineering Department office for those who wished to complete and resubmit them in this manner.

Distribution and collection of the return surveys for the D term IQP teams proved to be a more challenging task. Considering that it was the end of the academic year and most students elected to travel after completing their IQP abroad, the project team had to find an innovative way to compile the necessary results from the focus groups.

Having been informed that one of the students abroad had set up a "Hotmail.com" email account, the authors decided to utilize this asset. In collaboration with this one cooperative IQP team member, the project team sent the Word file to her a week before D term project culmination. It was easier to download from the WEB account than the normal "pine" email accounts that WPI's electronic mail system operates on. "Pine" proved to be slow and ineffective in attaching and transferring files. This person then distributed the survey, via a 3.5" floppy diskette, to the other IQP team members in Australia. Each of the IQP team members then completed the survey electronically and remitted the files to the one contact member with whom the project team established the "Hotmail.com" link. This one member then submitted each of the nine surveys to the authors via the same WEB email account. This method proved to be the easiest logistically for acquiring all the necessary data for proper evaluation of the IQP project teams.

The time frame in which the authors completed this task proved to be key. Enough time had to be allowed to thoughtfully complete the survey while still ensuring

the project team attained them before the students began their travels or summer excursions. The authors also did not want to distribute the surveys too early allowing for maximum input over the course of the respective IQP's. In doing this the week before D term projects culminated, the authors were able to obtain the necessary data in a timely fashion.

### *4.2 Focus Groups*

The three focus groups for this study included the C term 2000 Australia MQP groups, the D term 2000 IQP groups, as well as the authoring project team, as an on-campus control for comparative purposes only. Focus groups allowed the authors to evaluate distance advising in a case specific situation involving numerous groups in a single timeframe. By using the authors' group as a control, consistency was initiated in the study while still maintaining the integrity of evaluating Prof. Barnett as a distance advisor. Comparing their on-campus project experience, as well as their relationship with Prof. Barnett with that of the off-campus teams, allowed the project team the opportunity to make direct correlations in the differences between the focus groups thereby yielding the maximum effectiveness of the study.

Using the C term MQP groups as a test group, or experimental phase, for the studies the project team was able to offer guidance to the D term IQP groups while abroad. The authors developed a survey as an introduction and monitored their progress throughout the MQP's as well as utilized their experiences to model and reference the D term PQP process. By emailing the groups periodically while they were in Australia the team was able to gain a different perspective on distance advising with respect to communication issues. This afforded the authors the opportunity to familiarize

themselves with the Global Opportunities Program and in particular the procedures and research integrated into planning and accomplishing a project in Australia.

Constant analysis on the progress and concerns of the MQP groups led the project team to offer insight into the planning of the D term IQP project groups, their main focus group. The advice and issues directed to them by the MQP groups helped the authors devise methods to avoid the same incidents throughout the preparatory time.

Prof. Barnett also solely advised one of the IQP groups abroad, while co-advising the other two. Therefore, the project team could directly correlate his distance advising techniques to their own personal experience with him also as their project advisor. Using the IQP teams as their primary focus group induced the element of cohesiveness into the project team's study as they were directly related to Prof. Barnett in the same manner as the three Australia project teams. Had they performed this study using any of the other groups, the authors would not have attained the same level of consistency in the results. The MQP groups had co-advisors in their respective majors as well as project specific advisors on-site in Australia. Therefore the authors could not use them as their sole case study groups in this endeavor.

Being the control group in the study, the authors considered themselves as objective bystanders. They obtained and organized the qualitative and quantitative data in such a manner so as to yield the most efficient results in evaluating Prof. Barnett's advising techniques and improving the Australia Project Program for future groups. The study, in essence, focused on evaluating Prof. Barnett as an advisor. The project team's goal was to make his effort the best possible from the student's perspective. This helped lead the authors toward an objective point of view in the experience.

### *4.3 Sampling and Digression Methods*

The authors chose these focus groups for ease of project development as well as functionality. In sampling the qualitative data they chose to make general comments on the students feelings and concerns as a whole. The specific cases were overlooked except in cases of extreme concern or validity. When sampling the MQP data the project team also considered the person's major and its relation to the project.

In an analysis of the IQP groups the authors executed a strictly objective viewpoint in deciphering input from the students and their perspective versus that of their advisor, Prof. Barnett. When formulating recommendations, the project team sorted through the insight of these two distinctly different points of interest and reported the valid data specific to each.

### *4.4 Collecting Quantitative Data*

The survey was set up so as to rate each quantified result on a scale of one to five. 1 in each case indicated the least desirable result. For example, in a section rating the advisor, one corresponds to poor and five correlates with excellent. Therefore, in the results there is no mistaking that higher values indicate a more favorable result. This quantifiable data was then entered into a spreadsheet in which the mean for each question in each set of surveys was computed (See Appendix B). From this the authors realized a general feeling on the groups' capabilities and concerns, which proved to be more valuable to a busy advisor coordinating the combined experience.

### *4.5 Collecting Qualitative Data*

The project team decided on the methods by which the qualitative data from the surveys was collected and developed a method that would yield the greatest benefit from the results. The next step included determining how to best convey the qualitative data to the team's advisor for improving his advising style and/or the PQP process.

#### *4.5.1 Survey Qualitative Data*

Along with each of the quantitative questions in the survey, a few lines were included for further explanation of the rating the student selected. This offered the individual an opportunity to extrapolate on their thoughts and feelings as well as a means for the authors to make direct recommendations on specific areas of interest. The survey also included purely qualitative questions, which the authors carefully scrutinized. These questions were addressed in the same manner previously mentioned.

In compiling the data from the surveys, each project team member carefully read each survey, noting any key points of interest or concern. After each member had read the set of surveys the team engaged in a discussion of the results, which was noted throughout the discussion. After general points were made and reviewed then specific recommendations were formulated for discussion with Prof. Barnett.

#### 4.5.2 Electronic Mail Qualitative Data

Through consistent e-mail to the Australia project groups each term, the project team attained a great deal of qualitative data in the form of student's thoughts and concerns. Weekly, the team sent the Australia project groups a generic e-mail inquiring about any major concerns or difficulties in any aspect of their projects. Their responses

were indicative of a direct peer-to-peer relationship in which true feelings and interests were conveyed that may not normally be expressed to their advisor. This interesting phenomenon allowed the authors to redirect Prof. Barnett to best suit their needs. The Australia project group's influence on the status of their project and its success was directly related to the communication the groups maintained with Prof. Barnett.

In addition to the generic e-mails the project team also sent case specific messages noting key areas of interest or concern surfacing at their weekly discussions. These messages often included personal insight from the perspective of the on-campus project team evaluating distance advising and the authors' personal experiences. For example, the authors addressed concerns in Prof. Barnett's passive advising style and steps to better manage his insight and communication issues. The project team's personal experiences over the course of several months proved valuable in asserting the overseas project teams.

### *4.6 Organizing the Data*

The data acquired over the course of the surveys as well as the constant electronic mail responses included both qualitative as well as quantitative information. The quantitative data was compiled in spreadsheets with the respective project groups (See Appendices B and D). The on-campus project team, however, summarized the qualitative data.

In compiling the quantitative data, a Microsoft Excel spreadsheet was used for each group of surveys. Each question held a respective position in the spreadsheet with the students' responses entered into this row. The data was then averaged for the general consensus on that specific question. The authors compared this to the numerical scale

established and formulated a conclusion based on this information for the group as a whole.

In developing the qualitative data, the project team members each read the surveys for an impression of the students' responses. After each survey was read, a discussion was held and recommendations were made based on the impressions the students gave to the authors. This data was compiled in confidential recommendations offered to Prof. Barnett for further consideration. For instance, see Appendices G and I.

Organizing the qualitative input through the consistent e-mails proved a bit more challenging. After each reading the responses, the project team developed general thoughts and recommendations. This information was then analyzed based on the advisor's influence or the students' influence on the problem or issue. From this point, the authors then formulated possible outcomes that might rectify the issue being discussed with Prof. Barnett, to meet the students' needs as quickly as possible, so as to attain the best results to suit the situation.

Upon the completion of the Australia projects in C and D terms of 2000, the authors then compiled a complete analysis of the results for comparison. They sought trends in the IQP preparation that proved more effective than the MQP preparation as well as issues that appeared common to the respective projects. The authors then formulated general recommendations based on these issues for review by Prof. Barnett for future reference. The student-to-student interaction proved beneficial in improving the distance setting and academic experience considering the busy schedule of the advisor.

These recommendations were the goal of this project. The project team would like to inform the IGSD of concerns and interests of students completing projects in Australia. This may lead to a more comprehensive study involving numerous other project sites. Improving the overall experience of distance learning through a study of distance advising is the project's main focus.

### *4.7 Consistent Recommendations*

Recommendations based on the project teams' input from Australia through the course of their actual experience proved very helpful in Prof. Barnett's advising situation. Weekly meetings tended to be the site of discussions based on the Australia project teams' progress and concerns. Through an analysis of their situations, the authors were able to devise the best plan of action for a productive and enjoyable distance project experience.

Consistent recommendations also developed a common trust between the on-campus project team and those completing projects abroad. Through the effort of displaying genuine concern for their situations, the on-campus team was able to develop a working relationship with those abroad. In this sense the team was able to attain a different level of concern and evaluation that is only evident in a peer-to-peer relationship. The students seemed to convey a more personal and thorough interest in communicating interests to the authors rather than their advisor. Through the peer-to-peer interaction they were able to attain a better general understanding of the experiences at hand and convey them to Prof. Barnett more effectively and efficiently.

### *4.8 WEB Based Video Conferencing Set-Up*

A major issue facing distance advising includes the circumstances associated with distance communication. Students tend to have very limited experience with distance communication such as videoconferencing, WEB conferencing, or other communication programs. The authors proposed to train the Australia IQP project groups in NetMeeting as this seemed to be an issue that the MQP groups faced. After setting up sample videoconferencing sessions with Prof. Barnett during a brief visit he made to Australia, the project team put together a training guide for the IQP groups (See Appendix H). They hoped this assisted in a positive communication experience with the Australia project group's advisor at WPI. It is understood that this still requires initiative to accomplish, but the authors hoped that taking an active role in assisting any efforts would guide and motivate the comprehension of those students abroad.

## 5.0 ANALYSIS & RESULTS

### 5.1 MQP Analysis

As described earlier in the methodology of this project, the C term MQP students served as a test group, with the D term IQP students taking priority as the main focus group. Due to the fact that this project began too late to make any suggestions for the MQP groups, the authors instead observed these groups in the anticipation of making proposals to the IQP groups. Through constant communications with the MQP project groups throughout C term, by analyzing their surveys, and through weekly meeting with Prof. Barnett, the authors found a number of areas for potential improvement with the IQP students.

#### 5.1.1 MQP Surveys

The first step in the MQP test group analysis was to compile and analyze the results of the initial surveys given to the MQP students. The first survey served as a general overview of the students' thoughts, concerns, and expectations before leaving for Australia. The first major section, dealing with available technology, gave the authors an idea of which technologies students were most comfortable with and most knowledgeable of. A major theme in most of the students' quantitative responses was an apprehensive feeling toward certain communication technologies. While most students were very comfortable with international telephone calls and email, they were not as knowledgeable of such technology as ICQ, teleconferencing, web conferencing, and international internet service providers. Another question, dealing with the ease of use of these

technologies, showed similar results. Students felt that the phone and email were relatively easy to use, while the other four technologies were somewhat more difficult.

The results from the next two questions, regarding the efficiency of each technology and each student's preferred choice of technology while in Australia, displayed some very surprising and contradictory results. While students recognized teleconferencing and web conferencing to be the most efficient means of communication, the phone and email remained their preferred choice of communication. The question that arises, then, is why did this contradiction occur? One possibility is that even though students realized the efficiency of video conferencing, they were still generally unfamiliar with, and uneasy about its ease of use. However, another likely explanation is that the students were not willing to spend the necessary time it would take to learn the new technology, even though it would efficiently aid them in their communication with Prof. Barnett. This is an issue that arose later in the term for the MQP groups. At times, the MQP students seemed reluctant to cooperate in setting up new software or even participating in actual videoconferencing sessions with Prof. Barnett. In the survey, their answers to these questions were an initial sign of future problems, which will be discussed later.

The initial survey then moved on to focus on Prof. Barnett and more specifically his interaction with groups. One of these questions asked how many meetings, videoconferencing, email, ICQ, etc., per week each individual wished to have with Prof. Barnett. Another question asked each student how many times he or she thought the typical, on-campus project group met with Professor Barnett each week. The student responses to these questions were also interesting. While the mean for the contact for on-

campus project groups was 1.95 meetings per week, the MQP students only wished to meet with their advisor 1.45 times per week. This is related to their reluctance to utilize videoconferencing as a communication tool, and will also be discussed later.

The survey then moved on to ask more personal questions regarding Prof. Barnett's advising of his project groups. While the students realized that Professor Barnett possessed many strong advising characteristics, they also recognized some shortcomings and earmarked them as potential obstacles. The students noted his listening skills, management skills, and expertise in his field, objectivity, and overall guidance toward reaching their project goals as his strong points. On the other hand, they recognized that his flexibility and availability were relatively average and below average, respectively. One student noted, "He is very busy. Not around too often," while another explained, "Often it is difficult to set up meetings, which can cause problems to escalate." They distinguished Professor Barnett as being deficient in his flexibility and availability, even though his office was within a ten-minute walk of each student. When the groups were in Australia, this problem could potentially amplify to cause disastrous results.

One of the goals of this project was to not only evaluate the projects groups and Prof. Barnett's advising techniques, but to also aid him throughout each term in working with the various groups. The authors made him aware of the MQP students' general attitudes so that he might address these issues prior to their departure for Australia. Once notified, it was Prof. Barnett's individual responsibility to implement these modifications. Only after the projects were underway would the authors be able to judge whether any changes were successful.

Other important sections of the survey revealed that Professor Barnett was doing an admirable job in helping to organize their projects. The students felt relatively comfortable with their project and journey, and in no way felt limited by either Professor Barnett's advising capabilities or the foreign atmosphere they would be facing.

Another common response from the initial survey was that students felt their advisor was neither too commanding nor too relaxed in his advising of their projects. On a scale of 1 to 5, with 1 being very commanding and 5 being very relaxed, the students gave him an average of 3.1. This was interesting to the authors as Prof. Barnett was extremely relaxed in his advising of this particular project. While he would give advice when it was specifically asked for, he would rarely actively seek the authors out or give specific instructions. Although this passive advising technique was adequate for an on-campus project group, it was anticipated that Professor Barnett would need to implement a more active form of advising for the projects taking place overseas. This was another issue that he was made aware of, and it became necessary to wait and see how his style progressed over the course of the upcoming term.

This passive form of advising became a genuine concern over the Winter break. Judging from the surveys the MQP students completed, which suggested that videoconferencing would be the most efficient form of communication, it was determined that implementing Microsoft NetMeeting would be valuable to the project groups.

Web based videoconferencing was determined to be the most effective form communication due to its versatility, cost, and ease of use versatility. Although non-web based videoconferencing was considered as an option, it was too costly, and is also becoming obsolete in today's world of web-based videoconferencing. The students were

advised to set this program up over the break so that they could have videoconferencing sessions with their advisor the following term, in addition to the emails they would be sending him. However, the students did not comply, and left for Australia without installing the program. The fact that Professor Barnett merely suggested to his project groups to do this, rather than forcefully proposing this, was one of the reasons the program was not successfully implemented. The students did not comprehend the importance of setting up the program, and did not see it as an integral part of a successful project.

### *5.1.2 Communication During C-Term*

The authors began to correspond with the groups over email once they had arrived in Australia. Several issues were raised in these emails, including each group's reasoning as to why NetMeeting had not been implemented. Several of the groups explained that they were still somewhat apprehensive about using the program. One particular student wrote, "I think that he should have shown all of us how to work videoconferencing as opposed to just whoever knew already...Because when we do have it ready to go then I have no clue how to use it." Other groups expressed similar views regarding videoconferencing.

The authors discussed these concerns with Prof. Barnett, and realized that although it was too late to directly teach the groups how to use the program, it would still be necessary for them to make an attempt to install and run the program. The program had been provided, and installing it only took a few minutes. Once installed and set up, learning the program takes less than an hour of practice. Prof. Barnett suspected that

although the students were unfamiliar with NetMeeting, the actual reason that the program was not set up yet was because the groups wanted to avoid videoconferencing.

In corresponding over email, it is possible for the writer to easily mislead the recipients. Many of the groups, in their emails to the authors, had expressed that they were having problems with their projects. When they emailed Professor Barnett, they could conceal this fact much easier than through videoconferencing. Although hiding any problems is not a suggested practice, the students did for several reasons. First, they had local advisors and sponsors who they often looked to initially for assistance rather than Professor Barnett. Although Prof. Barnett was their main advisor, they often bypassed him as a means for help and looked to their other sources. Secondly, Prof. Barnett had not made his expectations clear enough before the groups left for Australia. He was not forceful enough in describing exactly what he wanted from the students and especially how he wanted the distance advising handled. As a result, the project groups did not expedite the setup of NetMeeting, and email, a much more indirect form of correspondence and a less efficient method, was used.

These were Prof. Barnett's personal opinions as to why his groups had not yet set up NetMeeting, yet similar views were expressed in the groups' own emails to the authors. For example, regarding videoconferencing, one group wrote, "We don't care about it but he wants it, we are like whatever. We know what we have to do and we are in good hands here, so it's annoying to email home three times a week with requests that we don't care about."

Through speaking with Prof. Barnett and receiving emails from the MQP groups, it was clear that both sides were at fault. Several groups complained that they emailed

Prof. Barnett several times without receiving much feedback. They complained that he only replied once in a while, and that when he did it was only a quick sentence to answer any direct questions. Prof. Barnett admitted that he did not like to reply to the groups unless they were off track or had any specific questions. However, judging from the students' responses, it was determined to be a good idea for him to respond more often, even if it was just to confirm that he received their email. It was also decided he was not active enough in his advising techniques. He had assumed that the groups could figure out on their own what needed to be done to increase communication. He recommended NetMeeting, but did not make it clear that it was a necessity. The groups, therefore, did not view it as such, and preferred either email or increased communication with their local advisors.

Despite some of these shortcomings on Prof. Barnet's behalf, the project groups, were also at fault. They realized that the communication was inadequate, and complained that Prof. Barnett did not respond well enough over email. However, they remained unaware of the fact that NetMeeting would greatly improve the communication. Some groups acknowledged that they did not care about using the software, and would rather just use email. Although they did not admit it, the authors sensed that this was due to the fact that by doing so, they would not have to deal with Prof. Barnett as much. As previously mentioned through the use of email, the groups could hide any problems they had and reduce the pressure. Others said they did not want to use NetMeeting and would rather correspond with their local advisors. All groups were having problems with their projects, whether large or small, yet they still refused to install the videoconferencing software.

In the middle of the term, Prof. Barnett spent two weeks visiting the project groups in Australia. Although it was essentially too late to set up NetMeeting at that point, it was valuable to display the communication gap. Production was much more efficient when Prof. Barnett visited with his project groups. One group said, "Of course Prof. Barnett is more helpful when he is in Australia. That is sort of a rhetorical question." With the communication gap gone, the groups could now collaborate more effectively with their advisor. The goal, then, became to formulate a plan to implement for the IQP groups to reduce this gap.

### *5.1.3 Adjustments for IQP Teams*

There were several major themes that were noticed throughout the completion of the C term MQP projects. Towards the end of the term, a final survey was distributed for the MQP students to complete, and they seemed to notice the same problems. To begin with, the students lacked an understanding of the potential communications difficulties. Although the groups had filled out the initial surveys, they did not realize the problems that could occur when such a great distance was added to the advising process. The importance of available technology had to be stressed up front. As part of this process either Prof. Barnett, the authors of this project, or a combination of both, would have to teach the IQP groups how to use videoconferencing, rather than assuming they would teach themselves. One of the MQP students directly suggested performing some test runs of the software with the IQP groups before they departed for Australia.

For the success of his off campus IQP teams, it became apparent Prof. Barnett would have to adjust a few of his normal practices and somewhat modify his advising techniques. The MQP groups had complained that various phone calls and visitors often

interrupted their meetings. It was necessary for Prof. Barnett to address this issue up front in dealing with the IQP groups. While this problem might seem insignificant, it affected relations with the groups, and every attempt to fix this problem would be helpful.

It was also noted that Prof. Barnett was lacking in availability and flexibility. This was certainly noticeable throughout the term, as many of the MQP groups complained that he did not respond to their emails adequately, and was generally not cooperative in their communications. At the same time, however, the MQP groups did not set up NetMeeting, which would have greatly improved the communication gap. First, by teaching the IQP groups up front about videoconferencing and its importance, the groups would be more apt to implement this tool into their projects. It was also decided Prof. Barnett would also have to be more forceful in his advising. Although the MQP groups had initially rated him as being neither too relaxed nor too commanding, it was obvious that in this distance advising setting, he was too passive. With the IQP groups, he would have to be clearer up front regarding his expectations and potential consequences. His laid back approach to advising might be outstanding with local project groups, but he needs to be more direct and forceful with overseas groups.

Another way for Prof. Barnett to improve his availability would be to implement a chat program. Although two programs were considered, AOL Instant Messenger and ICQ, ICQ was determined to be the better program. Although both have similar features, Prof. Barnett clearly preferred ICQ and already had ICQ installed on his computer. With this program, Prof. Barnett could have it running whenever he was in his office. If, at any point, the project groups had a question, they could send him a simple message over ICQ, and if he was in his office, could immediately respond.

Prof. Barnett would also have to be more conscious of responding to students' emails. Although many times it was not necessary to send a reply, it was determined that it would be a good idea for Prof. Barnett to reply to every email, even if it were just a short message to confirm he had read their email. As trivial as this response may seem, it makes the project team feel like their work is as important to their advisor as it is to them.

Finally, and along the same lines, communications would improve if the groups were required to send Prof. Barnett daily emails to inform him of their progress. Prof. Barnett took this idea one step further and suggested that they also be required to update their WebPages each week. The IQP groups, as part of their PQP, were required to create a Web Page relating to their project. Updating this on a weekly basis would be beneficial to both communications with Professor Barnett as well as their local sponsors. The authors asked the MQP groups about this idea, and they agreed that it would be very beneficial. One group responded by saying, "I believe that daily e-mails are a very good way of keeping students focused. The system that we are using right now has helped us a lot with keeping on track. We e-mail him on Monday, Wednesday, and Friday..."

The authors felt that these ideas would be very beneficial in dealing with the communications problems that were faced with the MQP groups. For the most part, the MQP groups seemed to agree with these recognized problems and the corresponding solutions.

## *5.2 IQP Analysis*

### *5.2.1 IQP Surveys*

The next step in this project was to repeat the distance advising process with the IQP groups, incorporating all of the previously mentioned suggestions and adjustments.

The IQP groups were first given an initial survey, similar to that given to the MQP students. Although the authors were generally satisfied with the survey that was given to the MQP groups, a few minor adjustments were made before giving them to the IQP groups. After the students had completed the surveys, they were collected, and the results were analyzed. The results of these surveys were not at all surprising, as they were very similar to what had been conveyed by the MQP groups. Again, although the groups recognized videoconferencing as an efficient form of communicating, they still preferred email. Regarding Prof. Barnett's personal abilities, they again felt that his poorest characteristics included availability and flexibility.

The similarities between the IQP initial surveys and the MQP initial surveys allowed an important assumption to be made. If the project were continued in the same fashion as it did during C term, the results would be almost identical. This gave the authors the confidence to implement the changes that were discussed earlier, which were based on the MQP groups' difficulties.

### *5.2.2 Implementation of Adjustments*

One of the primary goals of this project was to inform the IQP groups of available technologies, and to answer any questions they might have. Several copies of Australian AOL CDs and Microsoft NetMeeting CDs were obtained and distributed. A general information sheet, telling the students how to set up the two programs, and how to use NetMeeting, was also made and distributed. After giving the groups some time to review this material, an information session was held to go over the specifics of videoconferencing. Prof. Barnett had spent several weeks in Australia during C term to interact with the MQP groups. While there, the authors coordinated a time for the IQP

groups to videoconference with him. This seemed to be very beneficial, as they were able to see how to use the program. They observed various problems that could occur, the quality of the connection, and other general techniques to employ.

The authors also informed Professor Barnett of his deficiencies as an advisor, and how he could improve upon them. Therefore, he was much clearer up front with the IQP groups. He held several sessions to explain to them his expectations and evaluate their progress. It was also agreed upon that his emails would have to be more clear and specific, and that it would be beneficial to implement ICQ. Finally, he explained to the groups that he expected frequent emails and a weekly update of their WebPages to inform him of their progress.

### *5.2.3 Communication During D-Term*

The IQP groups departed for Australia, and the results for this term (D-term) were much different than for the previous term. Prof. Barnett immediately held a NetMeeting session with each group. Even though the quality of the connection was poor, this was an efficient way of beginning the projects correctly. In general, Prof. Barnett seemed to do a much better job during D-term in corresponding with his project groups. He took the suggestions that were given to him seriously, and made an effort to modify his advising technique. Throughout the term, the use of ICQ worked very well, as the groups were able to receive immediate feedback from him. The groups also videoconferenced with Prof. Barnett several times throughout the term. Again, the quality was not excellent, but it still greatly improved communications between the two parties. The groups sent Prof. Barnett email at least three times per week, and the authors also received feedback from each of the IQP groups over email. Unlike the MQP groups, the IQP groups made

excellent progress during the term. The MQP groups had generally made insufficient progress. On the other hand, the IQP groups met their project goals in an effective and timely manner. Major problems were avoided, and as a result, more specific issues were brought to our attention. Problems with interviewing, creativity in the write up of the IQP, and even areas as insignificant as using personal pronouns in the report were therefore able to be addressed. Under circumstances such as those surrounding the MQP groups, these areas might have gone undetected.

Although the projects proceeded much smoother than the previous term, there were still some minor difficulties that surfaced. Unlike the previous term, where Prof. Barnett seemed to be partially at fault for the lack of communication, the students this term seemed to be the cause of many of the problems that arose. Most of these problems were not direct results of the distance between the groups and the advisor, but were still indirectly related. Prof. Barnett complained that he felt he was being taken for granted. For example, at one point he set up a videoconferencing session for a specific time. Unfortunately, the group called him over an hour late. For distance advising to be successful, both parties need to make an honest commitment. Professor Barnett did his part by scheduling the time, while the project group failed to meet their responsibility. This was not an isolated incident, as Prof. Barnett went out of his way to accommodate the project teams a number of times, often with little cooperation from the students.

Many of the groups also showed signs of stubbornness and inflexibility. Most groups failed to realize that they were the students and Prof. Barnett was their advisor. They were at times uncooperative, and questioned many of his suggestions. In Prof. Barnett's defense, he has been advising project groups for numerous years, and generally

knows the directions the groups should take. This is an issue, however, that is difficult to solve, as it is not specifically related to distance advising. The best explanation for this phenomenon is that students often hope to perform their work as independently as possible, and this gets amplified if the advisor does not have direct contact with them. There is not any real solution for this, as it is difficult to change the common attitudes of college students. However, by communicating this issue prior to the students' departure for Australia, Professor Barnett might have been able to avoid the problem.

Another difficulty that arose during the course of the term was coordinating times to videoconference. The great time difference between the United States and Australia caused frustration on both ends. One of the project groups complained that Professor Barnett consistently made errors in scheduling videoconferencing sessions. They stated, for example, that he scheduled three groups to videoconference during a half-hour block, which was obviously not long enough. He realized this mistake, and asked them to adjust the times so that the three groups could meet with him for a total of one hour. Since the three groups were all living in the same apartment complex, he asked them to coordinate this between themselves, deciding which group would have to videoconference earlier. They found this request unreasonable, which is an unfortunate attitude on the part of the project groups, as it was much easier for them to coordinate the schedule. With distance advising, both parties need to be able to understand that difficulties are inevitable, and will need to compromise to correct it.

Finally, as previously stated, the quality of the videoconferencing was poor. In order to maintain adequate communication, Prof. Barnett often had to turn off the camera to his computer. Therefore, he was able to both hear and see the project groups, while

they were only able to hear him. This was somewhat unfair to the project groups, but it was the only way to effectively communicate through NetMeeting. Even with this adjustment, the connection was far from excellent. However, this form of communication was still more efficient than previous technologies. It was more effective than email, and at the same time cheaper than telephone calls. Future project groups, therefore, should hope for faster connections between the two computers to make for better NetMeeting quality.

As the end of the term approached, final surveys were again distributed to the project groups to assess their feelings about their advisor and of distance advising. After evaluating the surveys, it was clear that the project groups had many of the same concerns as Prof. Barnett had conveyed. For instance, they expressed similar feelings about NetMeeting. They were disappointed with the overall quality, which had first become evident through discussions with Prof. Barnett. Most groups blamed this on not only the poor audio and video, but also Prof. Barnett's involvement. They conveyed that most of the meetings were rushed, as he attempted to fit all three groups into a short period of time. They also noted, he was not flexible in these meeting times. According to the project groups, most meeting times were set up within a short period of time, on a specific day, and other alternative times were not available. Prof Barnett had set up two 45-minute blocks for the three groups to videoconference with him throughout the week, and it was the individual groups' responsibility to schedule videoconferencing sessions within this allotted time. The hour and ½ of available meeting time was apparently not enough for the three project groups. This made meetings unproductive, and most groups only became uncomfortable with the software and with their advisor. This issue, the

groups felt, could be attributed to Professor Barnett's other undertakings, and therefore his lack of time. They felt that he had taken on too many other activities, such as advising other projects, dealing with individual students, and teaching classes, and did not have the time to devote to overseas project groups.

Although the project groups are not necessarily in an adequate position to make this determination, they believed Prof. Barnett's busy schedule demonstrated a lack of commitment on his part. The problem resulted in the students feeling they were a burden to him rather than a group he really wanted to help. There were a number of miscommunications throughout the term, partially due to the distance between the advisor and the students as well as the lack of satisfactory communication technology. It reached a point, where at times, students were careful of what they said to him due to the fear that it would be misinterpreted. In speaking to Prof. Barnett throughout the term, he clearly demonstrated concern for the groups. The groups were not a burden to him in the least bit, and it seemed that he really cared about their well being as well as the progress of their projects. He often became frustrated as well due to miscommunications and what he sometimes felt was a lack of cooperation on their part.

Neither side is necessarily at fault. The communication gap is actually to blame, which does not lend itself to a perfect IQP experience. The groups felt, however, that this could have been corrected had Prof. Barnett had more time to devote to them. The nine final surveys that we examined all contained various suggestions on improvement, yet all pertained to the lack of time that their advisor devoted to them. For example, one student wrote, "I think if Dr. Barnett had office hours, it would have been better. We could have talked in a relaxed manner rather than at 7 a.m. and in a hurry." Another student felt that

the contact was inadequate, especially at the end of the term. This person suggested that Prof. Barnett devote an hour a week to the group, as he does with on campus groups, thus improving communications.

Another problem that arose throughout the term was one that occurred during C term as well. Even though the authors had indicated to Prof. Barnett that he had to be more attentive when responding to emails, the IQP groups revealed that he had not done so. Some groups said that he didn't respond to all of their questions, choosing only to reply to a certain few. One student suggested that Prof. Barnett could improve upon his advising had he, "Looked at our e-mails and responded to them each time. Even if it was just a 'Yeah, I got your note. I will get back to you in a bit.'" These thoughts had been specifically conveyed to him before the IQP groups had left for Australia, yet the students were still having difficulty with this issue. Prof. Barnett did make some improvement in this area, but it was evident that he still needed to improve his responses to the groups' emails even further.

There seemed to be several problems for both sides during the course of the term. These problems, however, can be connected with the lack of communication. Although NetMeeting was utilized as a communication tool, it was not used effectively. The lack of bandwidth had an immense effect on its usefulness, and more time should have been devoted to this tool, rather than rushed fifteen-minute blocks. These communication problems also extended beyond the use of NetMeeting as both sides became frustrated with misunderstandings and misinterpretations. One student wrote in the final survey, "Let me start by saying that Barnett is not the problem. It is the distance advising. We had no problems with his advising when we were face to face." The groups generally

seemed happy with his advising of their project and PQP during C term, but felt his advising faltered only due to the communication gap.

The sponsors of one of the project groups expressed these feelings as well. For example, one sponsor indicated disappointment with the lack of formal communication prior to the beginning of the project. They received no official notification that the project had been accepted by WPI. Also, they received limited information about the students, such as their interests, arrival time, etc. Finally, there was no direct communication between the sponsor and Professor Barnett regarding the expectations of the project. In one instance, a new sponsor was involved, and had never been involved in an MQP or IQP. Therefore, their expectations were much different than Prof. Barnett's, who has been advising projects for numerous years. This should have been discussed well in advance, so that misunderstandings and conflicts concerning progress and grades could be avoided. The sponsors also should have been made aware of the problems involved in distance advising. Some sponsors were unaware of the difficulties that develop as a result of the distance. They became frustrated with the scheduling conflicts, time difference, and miscommunications as well.

Overall, the lack in communication was truly the shortcoming of these projects. Prof. Barnett did an admirable job of adjusting his advising techniques to suit the situation, yet there was still more that could have been done to bridge the gap in communication. With practice, as well as the continuous advances in technology, the quality of distance advising will continue to increase.

## *6.0 CONCLUSIONS*

Distance advising proves to be a difficult and stressful experience for students and advisors alike. Throughout the course of this project the authors have had the opportunity to examine the cause and effect relationships of both sides of the situation. They have discussed, at length, the issues at hand with each group involved as well as with Prof. Barnett at their weekly meetings over the course of the three terms of research. In doing so, the project team has attempted to objectively place themselves in both perspectives with each new issue as well as evaluating it from this project's perspective as an on-campus project group. This analysis has led the authors to some astonishing results. Not only do they understand the perspective of the students but the project team also commends the efforts of the advisor.

It is clear that preparing the D term IQP groups with the aid of this project team greatly benefited Prof. Barnett in his effort to produce successful project teams and goals. On the other hand, allowing the C term MQP groups to begin their journey lacking the aid of this project team distinguished possible oversights on the part of Prof. Barnett. In addition, consistent evaluation of the overseas project teams' progress through the author's "check-up" emails seemed to bring a new aspect of the project concerns to Prof. Barnett in discussing them at weekly meetings.

Through the responses of the initial survey with the MQP groups, the project team realized that the students felt comfortable with email and telephone calls as a primary means of communication. However, some of the students had also used WEB conferencing programs such as NetMeeting before. Prof. Barnett clearly feels very adamant about NetMeeting as it allows him to observe students' visual cues while

presenting information and concerns. He realizes the impersonal effects of communication tools such as email. For this reason he chooses to employ software such as NetMeeting. He also expresses interest in associating a face with a conversation.

The MQP groups felt more comfortable with journeying to Australia to perform their projects initially than the IQP groups. They also assumed that they understood their task as well as feeling fully prepared to meet their goals. Unfortunately, their experience did not prevail as Prof. Barnett faced numerous communication challenges throughout C term 2000. They did not care to videoconference with him and felt that they were accomplishing as much as they could. In some cases though, students expressed concerns that they had lost sight of their project objectives or that this objective had changed altogether. In one instance, a project lab had been destroyed in a lab flood and water damage created havoc with their experimental set-up. Fortunately, through the cooperation of Prof. Barnett, the on-site sponsors, as well as the students involved these issues were resolved and the projects all turned out successful.

The MQP students, in general, found it helpful to communicate concerns and interests to the project team on a regular basis. They claimed that conveying concerns to the team as well as Prof. Barnett meant that they would certainly get addressed. After discussing specific concerns with Prof. Barnett on a weekly basis as well as inquiring about his views on progress and concerns the authors were able to formulate, through discussions with him, the best method to resolve a situation before it escalated.

After Prof. Barnett visited the MQP students in Australia in the middle of C term, their projects took on a definite direction. They expressed that this on-site meeting was essential to the progress of their project. He cleared up any confusion and problems with

their projects and/or sponsors. In general, the students felt much more comfortable with their situations and progress after Prof. Barnett met with them in person. From that point on, communication seemed better between the students and their advisor. Upon returning to the United States, however, they did have to complete their write up and finalize their project. For this reason, distance advising does not seem to be the optimum experience for the students and advisor alike. Had the students interacted face to face with Prof. Barnett on a more regular basis, the experience may have been more enjoyable and productive.

In dealing with the concerns and recommendations of the MQP groups the project team devised a method for training the IQP students to combat the poor experiences of the MQP groups before they surfaced. In doing so the project team planned a NetMeeting training sheet and session for the IQP students as well as a NetMeeting with Prof. Barnett that they could sit in on while he was in Australia visiting the MQP groups. This proved to be most beneficial. The students could base their expectations for communication issues before they left. They could experience the poor quality of the video and audio portions of the software limitations. In addition to this training session, Prof. Barnett had the students create web sites for their respective projects. This certainly gave their sponsor ample opportunities to review their progress before arriving in Australia. It also proved to be effective in giving Prof. Barnett insight into their progress while performing their project throughout D term.

The IQP groups seemed to express similar concerns to the MQP students, although some other concerns of the IQP groups could be attributed to reasons other that those of the MQP students. One major factor contributing to the issues relating to the

IQP projects is that Prof. Barnett was the sole advisor to these three groups. The MQP students had on-site advisors or sponsors who were experts in the field of study relating to their respective MQP. Being a technical project, Prof. Barnett could not interfere with the advice of this person or group. He merely served as a liaison between the group and the sponsor or the on-site advisor. In the case of the IQP's, Prof. Barnett served as the sole advisor to the project progress. Despite the fact that there was an on-site advisor for other IQP groups, Professor Matthew Ward, the group advised by Prof. Barnett solely corresponded with him. Their progress was judged and monitored by his knowledge from insight he gained through communication while at WPI. He also did not journey to Australia to check on their progress as he did with the MQP groups. This, in combination with the project based inexperience of the IQP students themselves brought on numerous concerns.

Preparing the students for the communication gap would have been impossible. Although the authors effectively aided them in attaining the knowledge of the communication tools available to bridge this gap, the project team could not fully prepare them for the experience. Prof. Barnett understood this concern and set his best efforts forward to lessen the anxiety of distance communication. The students started off great. They all felt the necessity for constant communication. Initially, they all felt comfortable in corresponding with Prof. Barnett so often and keeping him informed. Only until the project started to really take shape did they begin to face difficulties. One group felt that their project was not coming together well. After discussing this with Prof. Barnett, they were quickly put on track and felt confident in their efforts once again. Another group faced an issue in the written portion of the project. They could not understand Prof.

Barnett's recommendations and even got so upset that they were almost belligerent to him. The use of ICQ and numerous chat sessions seemed to combat any prevailing discomfort. Unfortunately, the IQP groups abroad did not enjoy the distance advising experience. They even felt overcome with anxiety and frustration at times.

It seemed that communication issues were more prevalent with the IQP groups than with the MQP groups. This could have been attributed to the nature of the project or the dynamics of the interaction between Prof. Barnett and the group's personalities themselves. Being a more objective project in nature, the groups were allowed more leeway in accomplishing their tasks and organizing and presenting their findings. Unfortunately, this warranted better communication between advisor and advisees. The dynamics of this situation are much more complicated than can be expressed. The daily emails, updated web page, constant chat conversations over ICQ, and consistent effort with NetMeeting proved a success, but the students still felt concerned about their success and progress through the completion of their project.

Prof. Barnett has a characteristic relaxed personality toward his advisees. The project team realized and understood this mentality from the onset of this project. In developing and working through the course of their effort, the authors took a proactive approach in accomplishing any tasks. They decided on proper courses of action in designing and completing this Interactive Qualifying Project. For this reason, Prof. Barnett has been very supportive and directional in this endeavor. The project team consistently trusted his advice and intuition. They feel that they developed an effective working relationship with him over the course of the eight months of this project. This was not the case for the D term IQP groups.

In completing their PQP, the IQP some teams felt confident with Prof. Barnett's advising style. They understood that he tends to offer insight only when questioned directly on an issue. This necessitates the proactive approach stated above. Through the course of their projects in D term, the IQP groups expressed concern in their efforts to piece their findings together. They lost faith and confidence in Prof. Barnett's advising style and seemed engrossed in their concern to finish their project write up. Numerous teams expressed disinterest to the authors in this situation. They felt lost in an effort to tie everything together. Prof. Barnett did give them all the necessary feedback, but after providing his mid term report where he expressed his major concerns for completing the project some teams were displeased with his feedback. In an effort to reconcile his concerns the groups expected more communication of his expectations. Prof. Barnett put forth his best effort to assist the teams in successfully completing their project. Communication continued successfully but the teams felt very distanced from his effort.

Perhaps Prof. Barnett was not stringent enough in tasking the IQP project teams so as to outline the necessary effort required for certain grading. He may have been too passive in his advising style. Interestingly, the authors felt very successful in assisting in his evaluation and advising efforts. The project team also felt, throughout the process, that Prof. Barnett was always there to offer assistance and guidance when necessary. In fact, one section of their weekly report involved a "questions/comments/concerns" section in which the team addressed anything relevant at that time. On the other hand, the D term IQP students seemed to question his credibility and lose faith in his competency in the final portion of their project experience. There is nothing that the project team could have done to fully prepare any of the students for a distance advising

experience like the Australia Project Center. In this instance, in order to gain the experience of performing a project abroad without a direct on-site advisor, one must sacrifice the personal interaction that comes with the on-campus experience. Therefore, it is the conclusion of the project team that no matter how great distance communication may be, a distance advising situation involving a sole advisor will encounter many circumstantial dilemmas.

## 7.0 RECOMMENDATIONS

Through the course of this project the team compiled numerous recommendations that prove useful for future reference in a distance-advising situation. Integrating the advice of faculty, student perspectives, as well as the advisor, the authors objectively conclude on a general compilation of points to make this unusual situation operate more effectively and efficiently. The project team researched various technologies and distance advising methods to gain a preliminary understanding of the topic. This knowledge was then applied to create an initial plan for the C term MQP groups. Observing these teams, and Professor Barnett's instruction of them, allowed the authors to make adjustments for the D term IQP groups. The use of surveys and general correspondence with the groups throughout the completion of their project helped to ultimately reach some important conclusions about distance advising. These results were then applied toward a primary plan of action. This plan can be used in future distance advising situations at Worcester Polytechnic Institute, and can also be adjusted and enhanced by future projects. The authors have also presented some secondary recommendations that can be used by these future project teams wishing to further this initial research.

### 7.1 Primary Recommendations

The primary recommendation includes a comprehensive plan to allow future projects and their advisors to communicate more effectively. There are several methods that can be employed, both with respect to technology and distance advising techniques, to enhance the overseas project experience for the students and the advisor.

It must be noted initially that although there are many improvements that can be made to these projects, distance advising is not currently an ideal situation. The team's recommendations can assist in optimizing the experience, yet on site, customary advising is the only ideal situation. Also, integrating advising techniques and advanced technologies can help the conditions, but will have no effect if the advisor does not have the time to commit to them. As noted by various project members throughout the course of our study, Prof. Barnett often did not have as much time as they would have liked to advise their project. This personal limitation must be noted up front, so that any recommendations made to improve the limitations that the distance causes can be differentiated from the conditions caused by the advisor's style. The authors personally did not notice any lack of commitment by Professor Barnett, and felt that although he has many undertakings at WPI, he still put forth his best effort in this endeavor. Nevertheless, it must be noted that complete commitment to the distance advising of project teams is required to ensure the recommendations made will have any effect.

### *7.1.1 Technology*

Even with recent advances in technology, connection speeds over such expansive distances proved to be far too slow to support effective videoconferencing. Although the overseas project teams did utilize software programs such as Microsoft NetMeeting to their advantage, it proved to be nothing more than a WEB based audio conversation. Professor Barnett was forced to turn off or pause the video portion of the connection as it constantly disrupted the audio signals making the conversation virtually impossible. After extensive research in the field of videoconferencing, other software was found that is comparable to Microsoft NetMeeting, such as VocalTec™ - Internet Phone 5 as well as

Ivisit - IPhone and Cu-See-Me. Unfortunately, in considering the cost to benefit ratio of other software, NetMeeting is still the best choice for videoconferencing for its ease of use and zero cost. In addition, the program is readily accessible to all students on the WEB.

In addition, due to the drastic time difference, fourteen hours after daylight savings time, Dr. Barnett was often forced to videoconference with the teams from his home where the connection speed is even slower than WPI's LAN connection. While this situation may be uncontrollable, it is something that needs to be addressed. Through a full understanding of this issue, the advisor could possibly arrange a LAN connection for videoconferencing through the project sponsor's. Both the receiver as well as the initiator of the videoconference should have a LAN connection for optimum effectiveness.

Most importantly, the videoconferencing software should be briefed to the students well before leaving the campus during the PQP state. It proved very useful to hold a training session for the project teams before going away. By showing them common misconceptions, walking through the set-up of the software, and a mock videoconference, the students can direct questions to the more experienced user. It is also beneficial to establish an instruction list for setting up the videoconferencing software for the journeying project teams.

Chat programs such as ICQ and AOL Instant Messenger proved most beneficial in addressing short conversations and direct questions. The students were able to get immediate responses to imperative questions. They could also address any other issues at will over these chat programs. In the future these programs should be an integral part of

the distance advising experience. Possible office hours for conversing over ICQ may be a suitable recommendation, only if arranged on an individual group basis to avoid confusion.

Finally, one cannot overlook the most obvious choice of electronic communication, email. All overseas project teams use this as a primary means of communication for reviewing and exchanging questions and files. It is a free and easily accessible means of communication. Unfortunately, one cannot detect the tone of voice messages are conveyed in. This brings about confusion and frustration. In combating this issue both parties must take caution in how they convey their concerns and comments. It is also paramount to keep an open mind in addressing these concerns on either end of the discussions.

### *7.1.2 Advising Techniques*

In addition to the available technology, there are also a few other methods in which distance advising can be improved upon. One of these is the adjustment of the professor's advising style. Many professors prefer a more passive approach to advising projects, letting the students have more control over the overall outcome of their project, and only providing guidance when it is needed. This advising style is beneficial to students working to complete an on campus project, however in the case of distance advising, it is imperative the advisor takes a more active roll in the projects. Past IGSD project groups have expressed concerns that they felt they were at a disadvantage because they did not have and on-site advisor, as well as not being comfortable with the effort that their distance advisor was putting forth in assisting their group. Oftentimes when groups got this impression, it was simply attributed to the professor's passive advising style. It is

important that the advisor realizes that his or her actions and efforts are often seen as the only help that a group may receive while abroad. The project team is in a foreign country with little assistance on their project, and the advisor must play a more active role in advising their students. One manner for the advisor to become more involved with the project is for him or her to always have an understanding of where the project stands. This should be done by frequently communicating with the team to discuss the project, and its progress. By maintaining constant communication with the overseas team, the advisor will know exactly how the project is progressing, as well as be immediately informed of any problems or questions that might arise. Keeping in close communication will also improve the work efforts of the project group. They will not feel neglected and will be able to ask questions whenever necessary to gain a better understanding of what the advisor seeks with respect to project goals.

In addition to maintaining adequate contact with the project team it is also important that the advisor and project sponsor be communicating on a regular basis. There are often minute discrepancies between the advisor's goals and the sponsor's objectives. In a distance-advising situation this places the students in an awkward dilemma. While the sponsor, who is on-site and with whom the team communicates face to face, may want one thing, the advisor, who assigns the grade, may be looking for something completely different. It should not be left up to the students to decide how to handle this situation. They should be able to simply work towards their project goal without trying to appease both parties with different results.

### *7.2 Secondary Recommendations*

The IQP team spent numerous hours analyzing the results of this study to prepare recommendations for future distance advising situations. For many instances, hard data is presented to accompany and support these recommendations. In some cases, however, the team suspected that certain recommendations would enhance distance advising, yet did not have the evidence to prove so. The authors did not have the time or capabilities to address these several issues. Therefore, several suggestions for the continuation of this project are presented, in the hope that a future team will attempt to pick up where this project left off.

To begin with, there is an obvious need to further research and develop the technologies used in distance advising. Although using a combination of email, ICQ, and Microsoft NetMeeting was adequate, and most likely an improvement over previous efforts, there were still problems with each. As previously mentioned, email causes inevitable misunderstandings and frustrations. To a lesser extent, ICQ does this as well. It seems that videoconferencing has the most potential to provide a clear, direct form of communication with minimal miscommunications. However, the circumstances under which NetMeeting was used with the D term IQP groups did not do this. The audio was choppy, and the video was either choppy as well, or nonexistent. Other forms of videoconferencing need to be researched. Either the connection speeds on both ends must be sped up by including a LAN connection, or other options must be considered. The project team considered three other options: Vocaltec Internet Phone, Iphone, and Cu-See-Me. Each of these programs was tested, and at the time, NetMeeting appeared

superior to them. However, there are numerous other programs available, and they must be examined to determine the most suitable for the large distances involved.

Additionally, if it is found that there is currently no real improvement over Microsoft NetMeeting, other alternatives to videoconferencing must be examined. For example, by turning off the video on his side, Professor Barnett essentially reduced NetMeeting to an audio conference call. Granted, turning off the video was necessary to improve the audio on both ends, but if this will be the case for future groups, is videoconferencing even worth using? Options as simple as the telephone should be considered. Long distance telephone rates should be explored, and then compared to the cost and effectiveness of videoconferencing.

ICQ proved to be a valuable asset for the D term IQP teams, as it allowed them to ask Professor Barnett simple questions, and carry on quick conversations. However, there are many other options that ICQ provides, and these options were not utilized effectively. Features such as file sharing would have been valuable to both the students and the advisor, yet they were not explored prior to the start of the projects. For instance, at one point Professor Barnett needed to view one of the team's final PowerPoint presentation. The group attempted to email the file to him, but could not do so. Microsoft NetMeeting has a file-sharing feature as well, but ICQ's file sharing tool would have provided a much faster and simpler means of sending the file to Professor Barnett.

A program called blackboard, which allows for easy uploads and downloads, would also have been effective in this case. Programs such as these, which allow for more effective and easier communication, must be looked at in the future as other means of bridging the communication gap.

In addition to researching other technologies, this project can be expanded to study the issue in a more refined manner. With Professor Barnett acting as both the distance advisor of the test groups and focus groups, as well as serving as this project's personal advisor, it proved to be extremely difficult to remain objective. Also, this study only focused in on one advisor, one overseas project site, and involved a minimal number of project teams to study. In the future, this project should be expanded to include a more diverse field to study. Hopefully, other advisors would be willing to become involved in such an endeavor. Also, there are many project sites that WPI offers students, such as Puerto Rico, Washington D.C., Denmark, Italy, and San Francisco, just to name a few. Each site introduces various difficulties that will affect the communication in different ways than the Australia site did. Finally, future projects should include a greater number of focus groups. This study only represented a small portion of the student body's views, and this should be improved upon.

A final recommendation for future groups attempting to reproduce this study, is to allow each group's local sponsor to become more involved in the process. It is unfortunate that the authors were only able to correspond indirectly with one of the group's sponsors. The information obtained from this one sponsor proved to be valuable to the results of this project, and it is unfortunate that more sponsors did not convey their feelings.

These suggestions will greatly improve future distance advising circumstances. The authors are extremely fortunate to have been given the opportunity for involvement in such a study. However, an optimum distance-advising situation has not yet been

reached. Hopefully, using the recommended adjustments, a future IQP team can improve the distance advising at Worcester Polytechnic Institute even more so.

### *7.3 Conclusions*

In retrospect, this study has revealed that distance advising, specifically in instances without an on-site advisor, is not recommended. Unfortunately, with limited resources, it is not practical to send numerous advisors abroad. However, the students, as well as the advisor, can be trained to be cognizant of the issues they may each face in this unique situation. Time and again the IQP and MQP students who were studied revealed that their projects were very successful; it was the distance situation that proved to be cumbersome in communicating their needs and objectives. Considering the limited resources and staffing ability, it is then the responsibility of the advisor or project center director to ensure the students understand and are prepared for the situation they are about to face.

Throughout this section numerous key aspects for improvement, as well as advice on combating potential issues before they arise, have been outlined. It is these key points that must be represented in training the global studies project teams and in particular the Australia groups. Although this project has focused simply on one advisor and his unique style, these same objectives can be related to most project sites. The project team has outlined major issues from a strictly objective standpoint. In collaborating closely with the students of this study, it was evident that these issues are of utmost importance in continuing to improve Global Opportunities projects both academically as well as professionally.

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## *Appendix A* – Interviewing and Questionnaires

### *Interviewing*

There are several key factors in conducting interviews. Each participant must remain comfortable throughout the interview. Therefore, the interviewer must avoid quizzing, or badgering, the participant. Every question should be read slowly, in the same order, and repeated if necessary (if misunderstood, misinterpreted, etc.). Each question must also be read and explained exactly the same for each participant in order to maintain the integrity of the interview. Throughout the session, the interviewer must keep track of any changes that should be made to the questionnaire, both for future interview, as well as to keep the participant comfortable.

As the interview progresses, the participant will most likely become more comfortable with the situation they are involved in. Therefore, personal information should be discussed at the end, as the participant will be more willing to cooperate, if they understand its importance. At the conclusion of the interview, the leader must also make sure to increase willingness for future contact.

One of the most important general recommendations for conducting a successful interview and keeping the participant comfortable is to probe for further information. If an answer is unclear, the interviewer must ask for further clarification to get the best possible response. This information is important as it relates to some of the processes the authors will be using in communicating with other project groups. The authors want the groups to remain comfortable and willing to give maximum effort throughout the process of the study. It is also necessary for the authors to follow many of these techniques. To

sustain optimum contact with the project groups throughout the course of the term, the authors must not badger the groups, keep them comfortable, track changes in the groups' attitudes and feelings, and increase willingness for future contact. (Young, 223-245).

### *Surveys*

There are several kinds of questionnaires that can be administered depending upon the situation and/or group it is being administered to, and the project group researched several of the major types.

### *Structured Questionnaires*

Structured questionnaires are those that contain specific, predetermined questions, and have not been created spontaneously during a questioning period. These questions may be refined, or new questions may be developed along the way if need for clarification exists. The responses to questions posed in structured questionnaires can be either open or closed. Closed form questionnaires are used when it is necessary to place data in defined classifications. These questionnaires are the most difficult to produce because the answers must be known prior to conducting the survey. However, many participants prefer this type of questionnaire because of a difficulty to express themselves while being surveyed. Additionally, closed form questionnaires allow data to be analyzed statistically, which is important in organizing and interpreting of data for groups of people (Fink, 33).

The open-ended responses, on the other hand, are unconstrained answers to questions, and the participant is not limited by choices to these questions. This type of questionnaire is used primarily for studies where a limited number of samples are available, or for preliminary research of new situations. In these cases, the participant is

asked to answer questions in essay form, with no restrictions. A wide range of answers is usually given, making it difficult to obtain statistical results. However, the answers can be used as an exploratory tool before any research objectives have been defined (Fink, 32).

### *Unstructured Questionnaires*

The primary advantage of unstructured questionnaires is flexibility. Unstructured questionnaires are also known as interview guides, and serve as a tool to assist the interviewer. They contain definite subjects that must be covered during the interview, but the interviewer is free to arrange and adjust the form and timing of the questions. While this type of questionnaire offers considerable flexibility, there are also several disadvantages. Even more so than the open-ended question of the structured questionnaire, the unstructured questionnaire usually acquires a wide range of answers, some being extremely useful and others being meaningless (Young, 192-193).

### *Language*

One of the most important considerations in constructing a questionnaire is its language. "The language should be concise and directed toward producing uniformity of understanding among the respondents. In evaluating a question, it is more important to ask, 'How will the respondent interpret this?' than to ask: 'What does this question mean (Young, 193)?"

The vocabulary chosen should be simple, so everyone being studied, even the least intelligent easily understands it. In the same respect, everyone should comprehend the phrases used. Jargon and other expressions that are only understood by some of the participants should be avoided. Each question should be straightforward and short, as

long questions that require too much focus on the part of the participant tend to be misinterpreted (Fink, 22-24).

Other expressions to avoid are those of a leading character, questions that sway how the participant will answer a question, or put words into his or her mouth. Pauline V. Young describes these questions, saying, "Presenting a choice to the respondent is acceptable, provided that more than one choice is offered. For example, the question 'Is...used most of the time?' invites an affirmative answer whereas the question 'Is...used most of the time, occasionally, or almost never?' invites no particular answer, and is, therefore, a non-leading question (Young, 194)." The phrasing of a question should not make the participant more likely to answer, "yes" than "no", or vice versa.

### *Arrangement*

Although the wording is one of the most important aspects of a survey, there are other significant considerations, such as the placement of the questions throughout the questionnaire. The easiest questions should be placed first, such as the participant's name, age, and relationship. Also, placing a question early in the survey that may affect questions later on is not suggested. Participants in the survey may be more likely to answer a question a certain way if they have been influenced earlier in the survey, or they may not answer the question properly.

There are also particular sequences that should be followed when developing a questionnaire. For example, a time sequence is important to follow, where questions should be grouped according to time. Participants should not have to jump from one time frame to another, as it will only make the survey more difficult for them to complete. Similarly, subject matter sequence should be followed. Questions relating to a certain

subject matter should also be grouped together in the questionnaire. If time sequence and subject matter sequence conflict, it is often beneficial to maintain the subject matter sequence over the time sequence (Young, 196).

### *Length*

While there has been much debate over how long a survey should be, the most important consideration is that the survey is complete and well designed, no matter how long it is. It is important to keep the questionnaire as simple as possible, but more important to make sure that the administration of the survey will be successful. Questions should be pertinent to the study, and unnecessary information or repetition should be avoided, to make the survey as short as possible. If a survey seems to be too long, it is more important to make sure that it can be administered properly, rather than trying to shorten it by removing important information or restructuring important questions (Fink, 55).

### *Form of the Response*

Standardized questions ask the participant to select from a list of preset choices. For example, possible questions to a standardized format could include those that require answers of "yes" or "no." A sufficient amount of information is not usually acquired from this type of question. However, tabulation of this type of question is very easy and can be converted to statistical data, and it presents relatively no bias (Fink, 15).

Multiple-choice questions are very effective, especially when there are only several answers to choose from and they are easy to understand. This type of question is also well suited for compiling statistical data, and presents limited bias if it is worded correctly. The participant should not be more likely to answer a question a certain way

based on the position of an answer among the choices, so care must be taken when ordering the choices. This type of question can be employed to rate a particular item. In the case of this study, the participants will be asked to rate both various technologies and Professor Barnett's advising capabilities. Therefore, this format will be most beneficial to use in the surveys (Singer, 124-125).

There are some drawbacks of multiple-choice questions. For example, there might be cases where it will be difficult to cover the entire range of a subject. If a subject is large, there may be important information missing from the questionnaire. On the other hand, attempting to include all the information on a particular subject may result in the questions becoming too complicated, or containing too many choices. Secondly, the choices must remain exclusive from one another. Choices that are too similar will make the participant uncomfortable and unsure. Finally, participants tend to remain conservative in their answers to questions, and avoid extreme positions. Therefore, this creates another difficulty in constructing a multiple-choice question.

Checklists are similar to multiple-choice questions. The participant is given a list of items and asked to respond to each item on the list rather than making a choice out of the items. This type of question is somewhat more involved and complicated than other questions, and should be used only when it is not harmful to the results (Young, 203).

### *Pre-Testing Questionnaires*

Before the survey is distributed, it is important that it be tested. Testing the survey allows mistakes to be detected before they are given to the final group. It tests the clarity of each question and allows the possibility of discovering new aspects of the

problem not expected in developing the survey. If a survey is not pre-tested, the result could be a low number of returns, or a lack of reliability and validity (Fink, 67).

## ***Appendix B*** – MQP Initial Survey

Name: _____ e-mail: _____
Major: _____

### *I. Demographics:*

1. MQP Topic and location: _____
   _____

   a.) Project Goals:
   _____
   _____
   _____

   b.) Project Partners: _____

   c.) Project Advisor: _____

### *II. Available Technology*

(Please circle the number answer that best describes your personal experience in each category.)

| | No Experience | | | | Very Experienced |
|---|---|---|---|---|---|
| 1. International Telephone Calls: | 1 | 2 | 3 | 4 | 5 |
| 2. E-mail (utilizing file attachments): | 1 | 2 | 3 | 4 | 5 |
| 3. International Internet Service Providers: | 1 | 2 | 3 | 4 | 5 |
| 4. Teleconferencing: | 1 | 2 | 3 | 4 | 5 |
| 5. ICQ: | 1 | 2 | 3 | 4 | 5 |
| 6. WEB Based Conferencing | 1 | 2 | 3 | 4 | 5 |

7. Rank the above for ease of use:

   _____ _____ _____ _____ _____ _____
   Most difficult Easiest

8. Rank the above for most efficient means of communication:

   _____ _____ _____ _____ _____ _____
   Least efficient Most efficient

9. Rank the above for your preferred choice of communication:

   _____ _____ _____ _____ _____ _____
   Least preferred Most preferred

10. A. How often would you like to have direct contact (real time) with Professor Barnett?

a. Once a day
b. Three/Four times a week
e. Other _____
c. Once a week
d. Less than once a week

10. B. How important is this time in meeting your project goals, and why?

_____
_____
_____

11. Would set office hours in addition to weekly meetings be beneficial, and why?

_____
_____
_____

12. A. In your experience with your advisor thus far, how have your meetings generally gone? (i.e. interruptions, productivity, communication…)

Poor 1 2 3 4 5 Excellent

12. B. Please explain:

_____
_____

13. How often do you think Professor Barnett meets with a typical on-campus project group?

a. Once a day
b. Three/Four times a week
c. Once a week
d. Less than once a week
e. Other _____

14. What are your major technological concerns in communicating with your advisor?

_____
_____
_____

***III. Distance Advising***

(Rate you advisor on the following qualities.)

| | Does not meet expectations | | | | Exceeds Expectations |
|---|---|---|---|---|---|
| 1. Listening Skills: | 1 | 2 | 3 | 4 | 5 |
| 2. Flexibility: | 1 | 2 | 3 | 4 | 5 |
| 3. IQP Related Expertise: | 1 | 2 | 3 | 4 | 5 |
| 4. Project Management Skills: | 1 | 2 | 3 | 4 | 5 |
| 5. Availability: | 1 | 2 | 3 | 4 | 5 |
| 6. Objectivity: | 1 | 2 | 3 | 4 | 5 |
| 7. Guidance toward achieving project objectives: | 1 | 2 | 3 | 4 | 5 |

8. Please explain your reasoning for any of the above answers which might need clarification.

_____
_____
_____
_____
_____

9. A. Do you feel your advisor is too commanding or too relaxed in his guidance of your project group?

Too commanding 1 2 3 4 5 Too relaxed

10. B. Please explain:

_____
_____
_____

11. A. How well do you feel your advisor has helped you organize your project?

Poor 1 2 3 4 5 Excellent

11. B. Please explain:

_____
_____
_____

12. A. Do you feel comfortable and well prepared with your project and prospective journey prior to leaving WPI?

Not Comfortable 1 2 3 4 5 Very Comfortable

12. B. Please explain:

_____
_____
_____

13. A. How much do you feel your advisor and his capabilities limit your success in achieving your project goals?

Completely 1 2 3 4 5 Not at all

13. B. Please explain:

_____
_____
_____

14. A. How much do you feel the foreign atmosphere you are entering will limit your success in achieving your project goals?

Completely 1 2 3 4 5 Not at all

14. B. Please explain:

_____
_____
_____

## *IV. Personal*

1. What sort of personal limitations do you expect to encounter (i.e. foreign culture, homesickness, emotional separation...)?

_____
_____
_____

2. Do you anticipate academic dishonesty becoming an issue in your project (i.e. your partner(s) not participating as much as expected)?

_____
_____
_____

3. How much time do you plan to spend on each of the following (weekly percentage)?

a.) IQP: _____
b.) Travelling: _____
c.) Social Atmosphere: _____
d.) Other _____

4. Do you feel there are any other major topics or concerns we have not addressed in this survey?

_____
_____
_____

5. Comments:

_____
_____
_____

***Appendix C*** – MQP Survey Qualitative Results

## Survey Results for MQP Students

| | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Student 6 | Student 7 | Student 8 | Student 9 | Student 10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **II. Available Technology (1-5 scale; 1=not knowledgeable, 5=knowledgeable)** | | | | | | | | | | | **Average** |
| 1-Phone | 4 | 3 | 3 | 2 | 1 | 5 | 4 | 2 | 4 | 4 | **3.20** |
| 2-Email | 2 | 4 | 5 | 3 | 5 | 5 | 2 | 5 | 5 | 5 | **4.10** |
| 3-IISP | 1 | 1 | 1 | 1 | 5 | 3 | 1 | 3 | 1 | 5 | **2.20** |
| 4-Teleconf. | 1 | 3 | 2 | 2 | 1 | 3 | 1 | 1 | 1 | 5 | **2.00** |
| 5-ICQ | 2 | 3 | 2 | 1 | 1 | 4 | 1 | 1 | 1 | 5 | **2.10** |
| 6-Web conf. | 1 | 1 | 2 | 1 | 1 | 3 | 1 | 1 | 1 | 5 | **1.70** |
| **7. Ease of use (Each technology is ranked 1-6)** | | | | | | | | | | | |
| 1-Phone | 1 | 2 | 5 | | 1 | 5 | 1 | 2 | 2 | 4 | **2.56** |
| 2-Email | 3 | 1 | 1 | 1 | 2 | 6 | 2 | 1 | 1 | 2 | **2.00** |
| 3-IISP | 6 | | 6 | | 4 | 2 | | 3 | 5 | 3 | **4.14** |
| 4-Teleconf. | 5 | 3 | 3 | | 6 | 1 | | 4 | 4 | 5 | **3.88** |
| 5-ICQ | 2 | 4 | 2 | | 3 | 4 | | 5 | 3 | 1 | **3.00** |
| 6-Web conf. | 4 | | 4 | | 5 | 3 | | 6 | 6 | 6 | **4.86** |
| **8. Most efficient (Each technology is ranked 1-6)** | | | | | | | | | | | |
| 1-Phone | 2 | 3 | 3 | | 4 | 6 | 5 | 3 | 2 | 6 | **3.78** |
| 2-Email | 1 | 4 | 6 | 1 | 3 | 4 | 1 | 4 | 1 | 2 | **3.00** |
| 3-IISP | 6 | | 5 | | 6 | 2 | 6 | 5 | 6 | 4 | **5.00** |
| 4-Teleconf. | 4 | 1 | 1 | | 5 | 3 | 3 | 1 | 3 | 5 | **2.89** |
| 5-ICQ | 3 | 2 | 2 | | 1 | 5 | 2 | 6 | 5 | 3 | **3.22** |
| 6-Web conf. | 5 | | 4 | | 2 | 1 | 4 | 2 | 4 | 1 | **2.88** |
| **9. Preferred choice (Each technology is ranked 1-6)** | | | | | | | | | | | |
| 1-Phone | 2 | 4 | 1 | | 1 | 5 | 2 | 2 | 2 | 6 | **2.78** |
| 2-Email | 1 | 1 | 6 | 1 | 2 | 6 | 1 | 1 | 1 | 2 | **2.20** |
| 3-IISP | 6 | | 5 | | 6 | 3 | 6 | 6 | 5 | 5 | **5.25** |
| 4-Teleconf. | 4 | 2 | 3 | | 5 | 2 | 4 | 3 | 3 | 4 | **3.33** |
| 5-ICQ | 3 | 3 | 2 | | 3 | 4 | 3 | 4 | 4 | 3 | **3.22** |
| 6-Web conf. | 5 | | 4 | | 4 | 1 | 5 | 5 | 6 | 1 | **3.88** |
| **10. Desired direct Contact time (meetings per week)** | | | | | | | | | | | |
| | 1 | 2 | 2 | 1 | 1 | 1 | 3.5 | 1 | 1 | 1 | **1.45** |
| **12. Quality of meetings (1-5 scale)** | | | | | | | | | | | |
| | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 4 | 3 | 4 | **3.40** |
| **13. Expected contact for on-campus groups (meetings per week)** | | | | | | | | | | | |
| | 7 | 1 | 2 | 1 | 2.5 | 1 | 2 | 1 | 1 | 1 | **1.95** |

**III. Professor Barnett's advising capabilities (1-5 scale; 1=negative, 5=positive)**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-Listening | 4 | 4 | 5 | 5 | 3 | 4 | 4 | 4 | 5 | 4 | **4.20** |
| 2-Flexibility | 2 | 3 | 4 | 3 | 4 | 3 | 3 | 2 | 4 | 3 | **3.10** |
| 3-Expertise | 4 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 5 | 5 | **4.50** |
| 4-Mngmnt Skills | 4 | 3 | 5 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | **4.50** |
| 5-Availability | 1 | 3 | 4 | 2 | 4 | 4 | 2 | 2 | 2 | 3 | **2.70** |
| 6-Objectivity | 4 | 3 | 4 | 3 | 5 | 4 | 3 | 4 | 4 | 4 | **3.80** |
| 7-Guidance | 4 | 2 | 5 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | **4.30** |

**9. Too commanding/Too relaxed (1-5 scale; 1=commanding, 5=relaxed)**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 3 | 3 | 2 | 3 | 3 | 3 | 4 | 3 | **3.10** |

**11. Help in organizing project (1-5 scale; 1=least helpful, 5=most helpful)**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4 | 3 | 4 | 4 | 3 | 4 | 4 | 2 | 2 | 1 | **3.10** |

**12. Comfort with project/journey (1-5 scale; 1=not comfortable, 5=comfortable)**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 3 | 5 | 3 | 3 | 5 | 3 | 3 | 2 | 5 | **3.50** |

**13. Limited by advisor's capabilities (1-5 scale; 1=yes, 5=no)**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 4 | 3 | 5 | 5 | 5 | 4 | 4 | 5 | 5 | **4.50** |

**14. Limited by foreign atmosphere (1-5 scale; 1=limited, 5=not limited)**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | **4.90** |

**IV. Personal**

**2. Academic Dishonesty A Potential Issue?**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | No | No | No | No | No | No | No | No | No | **No, 100%** |

**3. Time devoted to (Weekly Hours):**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MQP | 35 | 40 | 30 | 30 | 40 | 50 | 50 | 41 | 40 | 40 | **39.60** |
| Travel | 15 | 20 | 10 | 20 | 10 | 15 | 15 | 8 | 20 | 5 | **13.80** |
| Social | 20 | 20 | 20 | 20 | 40 | 35 | 15 | 38 | 20 | 30 | **25.80** |
| Other | 30 | 20 | 40 | 30 | 10 | | 20 | 13 | 20 | 25 | **20.80** |

## ***Appendix D*** – IQP Initial Survey

Name: _____ e-mail: _____
Major: _____

### *I. Demographics:*

2. IQP Topic and location: _____
_____

d.) Project Goals:
_____
_____
_____
_____

e.) Project Partners: _____

f.) Project Advisor: _____

### *II. Available Technology*

(Please circle the number answer that best describes your personal experience in each category.)

| | No Experience | | | | Very Experienced |
|---|---|---|---|---|---|
| 1. International Telephone Calls: | 1 | 2 | 3 | 4 | 5 |
| 2. E-mail (utilizing file attachments): | 1 | 2 | 3 | 4 | 5 |
| 3. International Internet Service Providers: | 1 | 2 | 3 | 4 | 5 |
| 4. Teleconferencing: | 1 | 2 | 3 | 4 | 5 |
| 5. ICQ: | 1 | 2 | 3 | 4 | 5 |
| 6. WEB Based Conferencing | 1 | 2 | 3 | 4 | 5 |

15. Rank the above for ease of use (Make sure you put down each choice. If you have never used a certain technology, list it towards most difficult.):

_____ _____ _____ _____ _____ _____
Most difficult Easiest

16. Rank the above for most efficient means of communication:

_____ _____ _____ _____ _____ _____
Least efficient Most efficient

17. Rank the above for your preferred choice of communication:

_____ _____ _____ _____ _____ _____
Least preferred Most preferred

18. A. How often would you like to have direct contact (real time) with Professor Barnett?

a. Once a day b. Three/Four times a week e. Other _____
c. Once a week d. Less than once a week

10. B. How important is this time in meeting your project goals, and why?

_____
_____
_____

19. Would set office hours in addition to weekly meetings be beneficial, and why?

_____
_____
_____

20. A. In your experience with your advisor thus far, how have your meetings generally gone? (i.e. interruptions, productivity, communication…)

Poor 1 2 3 4 5 Excellent

12. B. Please explain:

_____
_____
_____

21. How often do you think Professor Barnett meets with a typical on-campus project group?

a. Once a day b. Three/Four times a week
c. Once a week d. Less than once a week
f. Other _____

22. What are your major technological concerns in communicating with your advisor?

_____
_____
_____

***III. Distance Advising***

(Rate you advisor on the following qualities.)

| | Does not meet expectations | | | | Exceeds Expectations |
|---|---|---|---|---|---|
| 10. Listening Skills: | 1 | 2 | 3 | 4 | 5 |
| 11. Flexibility: | 1 | 2 | 3 | 4 | 5 |
| 12. IQP Related Expertise: | 1 | 2 | 3 | 4 | 5 |
| 13. Project Management Skills: | 1 | 2 | 3 | 4 | 5 |
| 14. Availability: | 1 | 2 | 3 | 4 | 5 |
| 15. Objectivity: | 1 | 2 | 3 | 4 | 5 |
| 16. Guidance toward achieving project objectives: | 1 | 2 | 3 | 4 | 5 |

17. Please explain your reasoning for any of the above answers which might need clarification.

_____
_____
_____
_____
_____

18. A. Do you feel your advisor is too commanding or too relaxed in his guidance of your project group?

Too commanding 1 2 3 4 5 Too relaxed

15. B. Please explain:

_____
_____
_____

16. A. How well do you feel your advisor has helped you organize your project?

Poor 1 2 3 4 5 Excellent

11. B. Please explain:

_____
_____
_____

17. A. Do you feel comfortable and well prepared with your project and prospective journey prior to leaving WPI?

Not Comfortable 1 2 3 4 5 Very Comfortable

12. B. Please explain:

_____
_____
_____

18. A. How much do you feel your advisor and his capabilities limit your success in achieving your project goals?

Completely 1 2 3 4 5 Not at all

13. B. Please explain:

_____
_____
_____

19. A. How much do you feel the foreign atmosphere you are entering will limit your success in achieving your project goals?

Completely 1 2 3 4 5 Not at all

14. B. Please explain:

_____
_____
_____

***IV. Personal***

6. What sort of personal limitations do you expect to encounter (i.e. foreign culture, homesickness, emotional separation…)?

_____
_____
_____

7. Do you anticipate academic dishonesty becoming an issue in your project (i.e. your partner(s) not participating as much as expected)?

_____
_____
_____

8. How much time do you plan to spend on each of the following (weekly hours)?

e.) IQP: _____
f.) Travelling: _____
g.) Social Atmosphere: _____
h.) Other _____

9. Do you feel there are any other major topics or concerns we have not addressed in this survey?

_____
_____
_____

10. Comments:

_____
_____
_____
_____
_____

***Appendix E*** – IQP Survey Qualitative Results

## Survey Results for IQP Students

| | Student 1 | Student 2 | Student 3 | Student 4 | Student 5 | Student 6 | Student 7 | Student 8 | Student 9 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **II. Available Technology (1-5 scale; 1=not knowledgeable, 5=knowledgeable)** | | | | | | | | | | **Average** |
| 1-Phone | 3 | 3 | 3 | 2 | 1 | 3 | 2 | 2 | 3 | **2.44** |
| 2-Email | 4 | 4 | 5 | 4 | 4 | 5 | 5 | 5 | 4 | **4.44** |
| 3-IISP | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | **1.33** |
| 4-Teleconf. | 2 | 4 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | **1.89** |
| 5-ICQ | 1 | 4 | 4 | 4 | 4 | 3 | 5 | 3 | 4 | **3.56** |
| 6-Web conf. | 1 | 3 | 1 | 5 | 1 | 1 | 2 | 2 | 2 | **2.00** |
| **7. Ease of use (Each technology is ranked 1-6)** | | | | | | | | | | |
| 1-Phone | 1 | 4 | 3 | 4 | 6 | 3 | 3 | 4 | 3 | **3.44** |
| 2-Email | 3 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 2 | **1.78** |
| 3-IISP | 4 | 6 | 4 | 5 | 3 | 4 | 6 | 3 | 5 | **4.44** |
| 4-Teleconf. | 2 | 1 | 5 | 6 | 5 | 5 | 4 | 6 | 4 | **4.22** |
| 5-ICQ | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | **2.22** |
| 6-Web conf. | 6 | 6 | 6 | 1 | 4 | 6 | 5 | 5 | 6 | **5.00** |
| **8. Most efficient (Each technology is ranked 1-6)** | | | | | | | | | | |
| 1-Phone | 2 | 4 | 3 | 2 | 3 | 1 | 1 | 2 | 3 | **2.33** |
| 2-Email | 5 | 3 | 1 | 1 | 5 | 2 | 3 | 1 | 2 | **2.56** |
| 3-IISP | 4 | 6 | 4 | 3 | 6 | 6 | 6 | 6 | 5 | **5.11** |
| 4-Teleconf. | 1 | 1 | 5 | 6 | 2 | 4 | 2 | 3 | 1 | **2.78** |
| 5-ICQ | 6 | 2 | 2 | 5 | 4 | 3 | 4 | 4 | 4 | **3.78** |
| 6-Web conf. | 3 | 5 | 6 | 4 | 1 | 5 | 5 | 5 | 6 | **4.44** |
| **9. Preferred choice (Each technology is ranked 1-6)** | | | | | | | | | | |
| 1-Phone | 2 | 4 | 2 | 3 | 1 | 1 | 3 | 2 | 3 | **2.33** |
| 2-Email | 4 | 2 | 1 | 1 | 4 | 2 | 1 | 1 | 2 | **2.00** |
| 3-IISP | 5 | 6 | 4 | 5 | 6 | 4 | 6 | 6 | 5 | **5.22** |
| 4-Teleconf. | 1 | 1 | 3 | 4 | 3 | 5 | 4 | 4 | 1 | **2.89** |
| 5-ICQ | 6 | 3 | 6 | 6 | 5 | 3 | 2 | 5 | 6 | **4.67** |
| 6-Web conf. | 3 | 5 | 5 | 2 | 2 | 6 | 5 | 3 | 4 | **3.89** |
| **10. Desired direct Contact time (meetings per week)** | | | | | | | | | | |
| | 1 | 1 | 2 | 1 | 3.5 | 2 | 1 | 1 | 2 | **1.61** |
| **12. Quality of meetings (1-5 scale)** | | | | | | | | | | |
| | 4 | 4 | 4 | 3 | 5 | 4 | 4 | 4 | 4 | **4.00** |
| **13. Expected contact for on-campus groups (meetings per week)** | | | | | | | | | | |
| | 1 | 1 | 2 | 2 | 3.5 | 1 | 2.5 | 2 | 2 | **1.89** |

**III. Professor Barnett's advising capabilities (1-5 scale; 1=negative, 5=positive)**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1-Listening | 4 | 3 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | **3.56** |
| 2-Flexibility | 5 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | **3.33** |
| 3-Expertise | 5 | 4 | 5 | 4 | 3 | 5 | 5 | 5 | 4 | **4.44** |
| 4-Mngmnt Skills | 3 | 3 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | **3.89** |
| 5-Availability | 2 | 3 | 3 | 2 | 4 | 4 | 5 | 2 | 3 | **3.11** |
| 6-Objectivity | 4 | 3 | 3 | 2 | 5 | 4 | 3 | 4 | 4 | **3.56** |
| 7-Guidance | 2 | 3 | 4 | 2 | 5 | 4 | 3 | 4 | 3 | **3.33** |

**9. Too commanding/Too relaxed (1-5 scale; 1=commanding, 5=relaxed)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 | 3 | 2 | 3 | 3 | 2 | 3 | | **2.11** |

**11. Help in organizing project (1-5 scale; 1=least helpful, 5=most helpful)**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 2 | 4 | 4 | 4 | 3 | 4 | **3.33** |

**12. Comfort with project/journey (1-5 scale; 1=not comfortable, 5=comfortable)**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 2 | 5 | 3 | 1 | 4 | 4 | 3 | 3 | **3.11** |

**13. Limited by advisor's capabilities (1-5 scale; 1=yes, 5=no)**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 4 | 5 | 3 | 4 | 4 | 5 | 5 | 4 | **4.33** |

**14. Limited by foreign atmosphere (1-5 scale; 1=limited, 5=not limited)**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 2 | 4 | 4 | 3 | 4 | 3 | 4 | 3 | **3.56** |

**IV. Personal**

**2. Academic Dishonesty A Potential Issue?**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No | No | No | No | No | No | No | No | No | **No, 100%** |

**3. Time devoted to (Weekly Percentage):**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MQP | 40 | 45 | 55 | 30 | 35 | 40 | 40 | 45 | 40 | **41.11** |
| Travel | 10 | 10 | 12 | 20 | 10 | 7.5 | 5 | 10 | 15 | **11.06** |
| Social | 30 | 15 | 20 | 40 | 22.5 | 12 | 10 | 20 | 20 | **21.06** |
| Other | 20 | 30 | 13 | 10 | 32.5 | 40.5 | 45 | 25 | 25 | **26.78** |

## ***Appendix F*** – MQP Final Survey

Name: _____ e-mail: _____
Major: _____

### *I. Demographics:*

3. MQP Topic and location: _____
_____

g.) Project Partners: _____

h.) Project Advisors: _____

### *II. Distance Advising:*

1. How often did you have contact with Professor Barnett?
   a. Once a day b. Three/Four times a week e. Other _____
   c. Once a week d. Less than once a week

1. b. Was this enough or too much? Why or why not?
_____
_____
_____

2. a. What were the sources of communication with WPI?
_____
_____
_____

2. b. Please explain any problems with each of the previously mentioned sources of communication.
_____
_____
_____

3. What is the reason for the lack in videoconferencing through the course of your project?
_____
_____
_____

4. What do you think Dr. Barnett or your project group could have done to better bridge the communication gap?

5. What did you perceive as some major faults within your MQP group as far as group dynamics?

6. What did you perceive as major faults and/or successes with the organization of your MQP with respect to each of the following?

   Advisor and PQP:

   Sponsor and affiliated organizations:

5. What do you perceive as major faults with Professor Barnett's advising techniques?

6. What do you perceive as positive aspects of Professor Barnett's advising techniques?

7. Was Dr. Barnett too commanding, too relaxed, or optimum as an advisor and why?

8. Disregarding the personal limitations of your advisor, how do you feel the distance limited your success?

9. How effective was communicating, through our IQP group, any issues you faced?

_____

_____

_____

10. Please address any issues not covered in this survey that you think are beneficial to note in our study.

_____

_____

_____

## ***Appendix G*** – IQP Final Survey

Name: _____ e-mail: _____
Major: _____

### *I. Demographics:*

1. IQP Topic and location: _____
   _____

   a.) Project Partners: _____

   b.) Project Advisors: _____

### *II. Distance Advising:*

1. How often did you have contact with Professor Barnett?
   a. Once a day b. Three/Four times a week e. Other _____
   c. Once a week d. Less than once a week

1. b. Was this enough or too much? Why or why not?
   _____
   _____
   _____

2. a. What were the sources of communication with WPI?
   _____
   _____
   _____

2. b. Please explain any problems with each of the previously mentioned sources of communication.
   _____
   _____
   _____

3. What is the reason for the lack in videoconferencing through the course of your project?
   _____
   _____
   _____

4. What do you think Dr. Barnett or your project group could have done to better bridge the communication gap?

5. What did you perceive as some major faults within your MQP group as far as group dynamics?

6. What did you perceive as major faults and/or successes with the organization of your IQP with respect to each of the following?

   Advisor and PQP:

   Sponsor and affiliated organizations:

7. What do you perceive as major faults with Professor Barnett's advising techniques?

8. What do you perceive as positive aspects of Professor Barnett's advising techniques?

9. Was Dr. Barnett too commanding, too relaxed, or optimum as an advisor and why?

10. Disregarding the personal limitations of your advisor, how do you feel the distance limited your success?

11. How effective was communicating, through our IQP group, any issues you faced?

_____

_____

_____

12. Please address any issues not covered in this survey that you think are beneficial to note in our study.

_____

_____

_____

## ***Appendix H*** – Summary of MQP Response E-mails

Professor Barnett:

We emailed all of the MQP students this past Thursday. We have received only two responses thus far, and are expecting at least one other report in the near future. Some of the general comments and concerns conveyed in the emails:

- The groups were not adequately prepared for their projects. Work was done during B term and over Christmas break, but it was not directly related to their projects. Therefore, it seems they are currently doing most of the preliminary work that should have been done prior to arriving in Australia.
- They do not seem to think they will be able to finish the MQP in 7 weeks.
- One group in Melbourne has attempted to install NetMeeting, but have not got it to work yet. Another group has not attempted to install it yet. Both groups have shown concern regarding their lack of previous experience using webconferencing.
- We will bring the emails to our meeting tomorrow if you would like to look at them. We were unsure whether showing them to you would compromise their confidentiality.

## ***Appendix I*** – AOL/NetMeeting/ICQ Instructions

### *AOL Set-Up Instructions*

1. Obtain copy of Australian AOL. If you lose, or choose not to use the copy provided to you, you can obtain another by purchasing a PC or equivalent magazine. Most of these magazines include a free copy of an Australian AOL CD.
2. If you are using the burnt copy of AOL, you will need to call AOL's customer service at 1-300-654-633. You will need to tell them that you have a copy of the AOL CD, but need a new password. The original registration number is 4S-3306-4627, and the original password is *DEMAND-SANER*. If you are using a copy that you obtained from a magazine, a password should be provided.
3. To install AOL, first insert the CD-ROM into the computer, and the AOL Install program should automatically start. If the AOL screen does not appear, double click on the "My Computer" icon on the desktop, and then double click on the "AOL Setup" icon. Finally, follow the easy instructions and begin your free AOL trial.
4. To install the AOL CD, you will need a credit card number. You will not be billed for this service as long as you call AOL and cancel before either your free hours are used up, or you have used the trial beyond 30 days, whichever comes first. If you run out of hours, purchase another magazine to receive another free trial. You will, however, need a different credit card number each time you use a new free trial.
5. If you have any questions, call member support at 1-300-654-633, or email aussiehelp@aol.com, or use AOL keyword "Tech Live."

### *NetMeeting Instructions*

1. If Microsoft NetMeeting has not already been installed on your computer, use the CD provided to you. Follow similar instructions for NetMeeting installation as you used for AOL installation.
2. Before you videoconference with Dr. Barnett, spend some time reviewing the various aspects of NetMeeting.
    - Make sure your video and audio are both sending and receiving. Spend some time looking at the various options in the main toolbar.
    - If you need to place a call, you will need the IP Address of the person you are calling.
    - Whiteboard – This option is basically a virtual chalkboard. It allows you to create, review, and update graphical information in real time.
    - Chat – This option allows you to write text messages to the person you are meeting with. It is the equivalent of AOL Instant Messenger or ICQ.
    - File Transfer – This option allows you to share or send files to the person you are meeting with.

- Program Sharing – If you would like to experiment with program sharing, feel free to do so. However, it is somewhat complicated, and may not be applicable.

### *ICQ Instructions*

1. Most of you are familiar with these programs.
2. Whenever Professor Barnett is in his office, he has ICQ running. This might be very useful if you have a quick question.
3. If you do not have ICQ, you can download the latest free version by going to www.icq.com.
4. This is a complicated program, but you will get the hang of it will practice. You will most likely only need to use the chat feature anyway. To get in touch with Professor Barnett, you will need to know his ICQ number. His address at school is 383298, and his address at home is 1498879.

## ***Appendix J*** – Suggestions for Term D 00 IQP Students

- Have set "office hours;" times when you guarantee to the project groups that you will be in a specific place, whether in your office, or at home. The students can have the option of emailing you, corresponding over ICQ, or even videoconferencing if need be. Most students wanted between 1 and 2 meetings per week, so maybe having one videoconferencing meeting per week together with the office hours will equal this desired meeting time.
- We have informed the groups of the various options available to them for corresponding with you from Australia. Hopefully, they realize the importance of keeping in touch with you. However, it would be better not to wait and see what happens, and instead take a more active approach to things (i.e. setting up a specific time to videoconference with them before they leave for Australia.).
- Ensure that the student's laptops have been set up for videoconferencing prior to their departure for Australia. Possibly due this the same day that they pick up their laptops over break.
- Possibly make the groups email you on a daily basis. Some of the MQP groups thought that this was a good idea, but instead of on a daily basis, only requiring them to email you approximately three times a week. Having them update their website on a weekly basis is also a good idea.
- Some groups were upset with your responses to their emails. Although we agree that it is often not necessary to answer them in detail unless they have a specific question, they didn't understand this. Maybe you could always reply to them as soon as possible, even if it is just a confirmation that you received their email.
- Another solution to this problem, as well as the general confusion that occurred, would be to explain to the IQP Groups your expectations regarding your communication with them before they leave for Australia. Explain to them your policies, and make sure they are clear and happy with this.