Surveying Student Opinion about the Humanities & Arts and Social Science Requirements

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*This report was also a result of the efforts of Alexander Turland and Elizabeth Whittle, who will be submitting their version of the project for approval in D'14

ABSTRACT

Currently there is no record of what the "typical" WPI student thinks of the current Humanities and Arts and Social Science requirements. Large scale data collection using a sample size of at least 350 students was required to get an accurate interpretation of undergraduate opinion. It was found that students understand the Humanities and Arts requirements more than the Social Sciences requirement, that students prefer to took classes they were interested in and that fit into their schedules rather than taking classes that would prepare them for the future, and that about 1/3 of students thought that the required number of Humanities and Arts classes was too high.

ACKNOWLEDGEMENTS

DIVISION OF WORK

Cody Gonyea:

- Cody is the primary organizer of meetings, presentations, project goals and objectives. He is responsible for writing literature reviews, contributing to the Methodology, Results and Analysis, and Conclusions sections, composing appendices B, C, and D, and the finalized formatting of the paper.

Jeffrey Signore:

- Jeffrey is responsible for construction of the survey through the use of the Qualtrics survey software. He has written literature reviews, contributed to the Methodology and Results and Analysis sections, and composed appendices A and F.

Alexander Turland:

- Alexander is responsible for construction of the survey through the use of the Qualtrics survey software. He has written the Methodology and Results and Analysis sections as well as one of the literature reviews.

Elizabeth Whittle:

- Elizabeth is responsible for writing 12 of the literature reviews. She contributed to the team's research efforts, the Methodology and Conclusions sections and assisted in the finalized formatting of the paper.

*A more generalized view of the work which was done by the group as a whole can be viewed in the Methodology section of this report (See page 25.).

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BACKGROUND

Introduction

The IQP project was found by inspecting the official list of projects on the WPI website. This project was the one that seemed most interesting to all members of the team, and it was agreed upon that each team member could bring something useful to the project. After speaking with the advisors, a more specific problem statement was created as follows: "The project will survey WPI undergraduates concerning their expectations, attitudes, work commitments, and anticipated outcomes/benefits of the Humanities and Arts and Social Science requirements". An important distinction between this IQP and the results of all of the course reports is that this project aimed to obtain more generalized results, in that the data gathered was not specific to individual classes. Moreover, the data gathered pertains more to the requirements, and to either the humanity and arts or social science department in general, and even to disciplines within each department, as opposed to the specific class and the specific professor that is targeted for evaluation by the WPI course reports.

Accreditation Agency [13, 14, 15]

For all engineering institutions, including Worcester Polytechnic Institute, accreditation must be present in order for the higher education establishment to be considered offering an education that meets the quality standards established by the profession that prepares students for post-graduation employment. Every university that consists of applied science, computing,

engineering, and engineering technology must consist of accreditation from ABET. ABET is the accreditor by the Council for Higher Education.

The United States requires two types of academic accreditation: institutional and specialized. Institutional accreditation is from national and regional accreditors. This type focuses on the overall quality of an institution. Specialized accreditation focuses on the individual program and ABET only accredits specialized accreditation. They have accredited about 3,100 programs at over 670 colleges and universities. Inside ABET, there are four accreditation commissions: Applied Science Accreditation Commission (ASAC), Computing Accreditation Commission (CAC), Engineering Accreditation Commission (EAC), and Engineering Technology Accreditation Commission (ETAC). ASAC accredits bachelors and master's programs, CAC accredits bachelor's degrees, EAC accredits bachelors and master's degrees, and ETAC accredits associates and bachelor's degrees.

Accreditation is vastly important to an institution because accreditation is another word for value. The present value is proof that the graduates of a specific program have met the standards that are needed to enter the professional world. Students who graduate from an accredited institution have a vast amount of opportunities for the future such as better employment, licensure, registration, certification, graduate education, and global mobility.

Out of all the individuals who are impacted by accreditation, students are the most impacted, due to being the ones who require utilization after a degree is obtained. The quality of the degree is crucial because it impacts the success and future of an individual. Receiving a degree from an ABET accredited institution provides several benefits. Some of these benefits are: verification that the quality of the educational experience received meets professional

standards, increased employment opportunities, easier access to professions involving licensure/registration/certification, and established eligibility for several federal student loans/grants/scholarships.

Attending an ABET accredited agency gives assurance to students and their families that they are receiving a top notch education. Some of the assurances of the ABET institutions are: the institution is committed to improving their educational experience, the program is committed to using best practices/innovation in education, the program is guided by the industry/government/academic constituents via formal feedback, and the program considers the students' perspective as part of its continuous quality improvement process.

Accreditation is important to the program amongst the institution because of the positive reputation given to it. Some of the facts that are universal amongst ABET accredited programs are: has received international recognition of its quality, promotes best practices in education, directly involves faculty and staff in self-assessment/continuous quality improvement processes, is based on learning outcomes instead of teaching inputs, and can easily determine the acceptability of transfer credits amongst institutions.

Worcester Polytechnic Institute is an accredited institution of the ABET. The ABET shows that although engineering schools, such as WPI, are math and science based, that the humanities and arts classes are important and necessary to the degree obtained. Thus, the project is significant to the experience of the WPI student.

Literature Reviews

The following section details all of the literature reviews that we completed. These literature reviews were all chosen as prime sources because of their utility to the project in either the survey planning phase, the survey implementation phase, or the results and statistical analysis phase. These sources were chosen as reliable sources because they were both .edu sources and therefore being associated with (upon inspection) reputable educational institutions, or authored by other reputable figures. For example, a number of the sources dealt with how to create a proper survey. These sources ranged in topics from ideally designing a survey and making sure to have a question for every question we wanted an answer for, to correctly wording questions in order to avoid biasing or confusion. A number of the sources also dealt with survey implantation, which could touch upon the best method of obtaining results, or what type and quantity of reward is best to increase the response rate. The last phase, the result analysis phase, had a majority of sources explaining what statistics to perform on the data that was received. These topics included in-depth explanations of t-tests, chi-squared tests, and analyses of variance, as well as broader explanations of why these tests were useful and what could be gained by performing these tests.

This article, called "Best Practices for Improving Survey Participation," is written and owned by Oracle. The article was written in order to document some of the best practices that will aid in increasing the response rates of any given survey. These practices relate to the topics of question creation, survey construction, and feedback analysis, and in the article there are three separate sections which each deal with one of these categories.

The most relevant section is the first section, which deals with presenting seven of the best practices for question creation, including the following:

- Keep the survey relevant to assure that the questions being asked will have answers that are useful to the purpose of the survey.

- Make the questions, as well as the possible answers, as short as possible, which is important because the shorter they are, the more likely that the audience will continue having interest in the survey and will continue to actually read and take the survey.

- Write concise questions, in order to make sure that the audience does not get confused or are unsure of the question's purpose.

- Use simple language in order to ensure that the audience can understand the exact meaning of the question and therefore reply to it most appropriately.

- Be careful with the response choices, because it is important to present any option that any member of the audience could think of as a possible response in order to ensure that the answers provided are all as accurate as possible.

- Use clearly defined answer labels, which is especially important for questions that involve rating in order to ensure that all questions are being answered or rated on a uniform scale for all respondents.

- Use open-ended questions sparingly, because this not only decreases the time required to take the survey (and therefore decreasing the likelihood that a reader abandons it) but it also creates fewer questions that will have answers that must be analyzed individually as opposed to a multiple choice question which could be analyzed, to a degree, automatically by the surveying software.

The other two sections, which are also relevant to the project, are constructing and executing the survey, and analyzing the results, respectively. Some topics presented in the second section include timing the survey, keeping it personal, motivating the audience, and optimizing and testing. These topics are important because they specify how to properly send out the survey at the best timing to get the highest response rate, how to continuously relate the survey to the audience to keep their interest levels high, how to encourage (and provide incentives to) the audience to complete the survey, and how to modify and improve the survey based on test results in order to get the overall best results with the final draft. Topics included in the third section include using scores and charts, using proper organization and archiving, and identifying trends. These topics are important because they specify how to calculate and represent the data received, how to present and store data in an organized manner according to category or subject, and how to analyze data specifically in looking for possible patterns in the received responses.

This paper was very useful in creating the survey questions and in distributing the survey and later in analyzing the results. The rationale behind all the strategies presented in this article is logical, because the strategies create reliable solutions to potential problems that could be encountered when creating a survey. By using the practices presented in this article, the group was able to avoid these problems and therefore created a better survey that will hopefully obtain better (and more) results. When proceeding to the further stages of the IQP, this article will likely be revisited countless times in order to ensure accuracy and quality in every step of the project.

Review #2: "Determining Statistical Confidence in a Survey" [2]

The article "Determining Statistical Confidence in a Survey" touches upon response rates when conducting a survey. In the article, the four factors of determining statistical confidence are explained, which are: size of the population, segmentation analysis desired, degree of variance in response from the population, and tolerance for error.

The size of the population for our survey is around 4,000 undergraduate students. In the project's survey, there is minimal, if none, segmentation analysis desired. Yes, there are demographics we are asking such as: gender, class year, and major, primarily focusing on the gender and majors due to the responses to the survey. The main purpose of the demographics are to make sure our data are representing the overall student population, percentage wise per demographic. In order to require fewer responses from the population, the consensus of the responses would need to favor the humanities and arts and social science requirements, or not favor them; they need to be very similar to each other. If the responses vary as described in the article, then more responses will be essential to conclude with confident data. The tolerance for

error in the survey is not extremely low as would be needed for making risky business decisions as described in the article, but the results could potentially result in a project following this one. The group desires the lowest error possible for the completion of the project, but if the error percentage is a little big greater than desired, nothing serious can happen. For example, in a risky business decision environment, the tolerance for error is lower because if something goes wrong or is done less than perfectly, vast amounts of money can be jeopardized, as well as jobs. If the number of responses is a little less than the minimum desired, the data has a less percentage of confidence, but there is no harm done to any individual or the school. The tolerance for error is in between not important and extremely important looking at the project overall due to the fact the group wants the most accurate results possible but is low to the group as a whole, due to the almost no risk involved.

A few important points that the article states have to do with percentages of responses from the population. First off, the most obvious one is that the more individuals who respond to a survey in a small population, the more accurate the results are. However, the bigger the population is, the number of individuals who need to respond doesn't have to be as high as a percentage as the smaller populations.

In the graph displaying the percentage of certainty and the percentage of margin of error for the different population sizes, the population being considered for this IQP is roughly 4,000. Thus, by looking at the graph, it can be determined the percentage of accuracy needed for the survey. In accordance with this information, roughly 350 student responses to the survey will be needed, for a 95% degree of accuracy.

The article "Survey Response Rates" subject to this review mentions how internal surveys are typically more responded to than external surveys, and explains the difference between these. This article also explains how a response rate over 85% can be achieved.

There are several ways that response rates can be influenced, according to the article. Some of the influences are: population loyalty, incentives, invitation wording, and perceived benefit from participating in survey. The group will use all these factors in attempting to maximize the response rate. The team is counting on some of the students to fill out the survey based on WPI student loyalty. There are some individuals who will fill out a survey executed by other students in order to help them out. Another influence the group will utilize is $500 worth of incentives for the majority of the population, who does not consist of population loyalty. The execution of the survey will be taken into account, to ensure that every student has multiple opportunities to take the survey and win a prize. Lastly, in the introduction the survey, it will be made clear that the data collected from this survey can potentially be used for future applications to further examine and possibly impact the humanities and arts and social science requirements. No personal suggestions will be made for any alternations, but the data can potentially lead to multiple follow up projects and actions.

The article states that internal surveys generally consist of higher response rates than external surveys. Thus, the survey is internal, only consisting of undergraduate students. Alumni of WPI have gone through the different requirements in their entirety, but the percentage of them who would answer is significantly lower than current enrolled students, as the article states.

Also, this can be assumed due to the fact that not every alumni is involved with WPI activities as they were during their undergraduate years.

In order to strive to achieve the 85% population response rate (which would surpass our needed minimum), the methods explained in this article will be applied. First off, the team will motivate the population with the already mentioned $500 worth of incentives. With college students as the selected population, the motivation for free gift cards for places they would be highly interested in purchasing items from is a great way to motivate more individuals to participate.

The survey is no longer than 10 minutes to complete, which is another suggestion from the website. Suggestions have been given from professors to add more questions to our survey, but the team has resisted in efforts to not make the survey longer than will allow viable results.

Lastly, the group is going to send reminders in different fashions for individuals to take the survey in hopes of more responses. Several of the methods presented in this article are going to actively be used to promote our survey and achieve the needed results.

Review #4: "How Statistically Valid Are Your Survey Results?"[4]

The article "How Statistically Valid Are Your Survey Results?" has a chart that displays the number of responses needed relative to the population number to have 95% certainty that the data are accurate. This article also explains that if the desired amount isn't given, then in the report on the data it needs to be explained that the data are from the opinions of the percentage filled out. This will be used information to determine if the sample size for the IQP's survey is

legitimate enough for viable results. If in the worst case scenario, the needed sample size is not met, the following methods will be implemented in order to explain the project findings.

In this article, there is a chart that displays the absolute minimum responses needed in order to have 95% certainty with the results. Going step by step reading the chart described in the article, the total number of individuals needed for the survey can be determined. The survey will be sent to approximately 4,000 individuals. There is a column that coordinates with population sizes. In the column next to population sizes, there is a corresponding column with minimum sample sizes that result in a 95% certainty of data. The number that coordinates with the 4,000 population size for this survey is 350 individuals. Thus, the minimum number of individuals the team needs for viable results that represent the opinion of the population of undergraduate students is 350.

Worst case scenario, if the group does not obtain the minimum 350 student responses, the team needs to know how to report the data not received in the report. In this case, the group will use the last step observed and explained in the article. The report will state that the findings only represent the opinions expressed from those few individuals. It needs to be clear that these findings do not represent the population as a whole, as it normally would, with the appropriate number of responses.

This source will be very important to the final report because it gives a solid sample size needed and explains how the research can still be valid, but in a different fashion, if less than 350 responses are present.

The article "How to Increase Response Rates for Customer Satisfaction Surveys" talks about the factors to achieving a higher response rate. It slightly differs from others with similar context because it is a customer satisfaction survey. The group's survey is not quite one offered at a supermarket, but the goal of the survey is to discover if WPI students are satisfied with the humanities and arts and social science requirements and departments. The team will accomplish this by asking specific questions regarding students'' experiences in the classes they took to complete the requirements. Thus, these elements of the article are viable and important to the project.

There are five key elements that are associated with survey response rates being influenced: target audience, survey frequency, timing, perceived benefit, and incentive. The target audience in the team's project is the WPI undergraduate population. As mentioned in the article and applied to the group's needs, the survey should not be given out to individuals who have not started the humanities and arts and social science requirements. However, there is no alias that excludes these few students. In order to make sure only individuals who have started or completed these requirements fill out the survey, the survey is designed for certain questions to pop up due to specific answers to specific questions. For example, if a student answers that they have not taken any humanities and arts and social science classes, they cannot continue with the survey. This will help avoid useless information obtained and a student's time wasted.

The aspect about survey frequency will not be used for the project because this article talks about the same survey being used over and over again, possibly over a few years length. The group has one survey and only 2 months to collect data; thus this aspect will be void.

Survey timing will greatly be taken into account based on this article due to the life of a typical WPI student. For example, the group plans on emailing out the undergraduate alias a couple times in hopes of obtaining responses, along with the other methods decided, such as social media and table sitting in the campus center. However, there will be no attempts to receive responses during midterm and finals week, because these are the two weeks during a typical WPI student's term that are the busiest, and chaos tends to occur. Students will not be focused on filling out a survey, even with incentives involved – they will be studying for a week straight and become very fatigued because of it. Thus, the attempts for responses will start the first week of B term when everyone is the least busy, and work at it every other week besides these two weeks. This deadline had to be revised, as explained in methodology.

In the introduction of the survey, it will be explained that although the group is not using the data received to make suggestions for potential improvements to the humanities and arts and social science departments, the data will be available for future IQP groups, as well as faculty, to potentially make changes/improvements. Thus, as described in the article, the team hopes more students, especially ones dissatisfied with the requirements, will be more likely to complete the survey in hopes there will be changes/improvements

With $500 worth of incentives, the group is going to attempt to motivate the target audience to take the survey. Although this article talks about customer satisfaction surveys, gift cards are going to be offered to students to win in a raffle they can enter if they complete the survey. The team is going to take the idea of an incentive being offered as stated in the article, but offer a completely different one for our purpose.

The article "Introduction to Survey Methodology and Design" specifically touches upon the necessary understandings and facts a student needs to know about a survey IQP. This is a very important article relevant to our project because every group member must be able to answer the true or false personal quiz questions correctly to ensure the survey made is legitimate and will produce the most accurate data and effective survey.

The true or false questions presented that are relevant to our project are:

1) Determining the opinions of the population of a city of 10,000,000 people requires a much larger sample than an opinion survey of a city of 100,000 people.
2) Survey questions should appear in random order.
3) Posting a survey on a website is a good way to reach large numbers of people and to increase sample size.

Every member of the project group can answer the above questions correctly, thus reflecting their knowledge of important elements essential to the completion of the survey. These elements are: needing at least 350 individuals as the number of responses from a 4,000 sample size, chronologically ordering the survey questions, and utilizing email and social media to distribute and promote the survey.

This article is very important towards this IQP because it is from Worcester Polytechnic Institute, the technical school that requires such a project. Thus, if everybody in the group meets

the WPI requirements knowledge wise for conducting a survey for an IQP, then the group can be confident with further actions taken.

Review #7: A Web Survey of Winter Sport Accidents Involving Equipment Failure" [7]

The report "A Web Survey of Winter Sport Accidents Involving Equipment Failure" consists of an in depth methodology section describing the aspects of a survey online, which is the same type of survey that was constructed for this "Surveying Student Opinion about the Humanities & Arts and Social Science Requirements" IQP. This report is used as a basis that the researched methods for conducting and administering the survey are correct, and have the best chance to obtain a high response rate.

The first aspect that the group's project and the project already completed and being reviewed share is the fact that both surveys made are not too long. The team, as well as the group that wrote the report being reviewed, concluded that a survey past a certain length will result in individuals losing interest in filling it out. Although the team has been given input from faculty about adding more questions to touch more bases, the group resisted for the purpose of not having a survey too long that students will not fill it out. A couple more aspects that both projects share is making sure every question is clear for any student to understand, and making sure the survey is easy to navigate. Both groups have concluded that these two aspects are important towards a higher response rate because it gives student no reason to not complete the survey once they have started.

The team's projects, as well as the project subject to this review, both consist of demographics to compare results. There has been slight questioning if the demographics are necessary for the group's project. This report confirms the team including them, as the completed report also did, is a beneficial aspect of data collection.

Along with the demographics, the Interactive Qualifying Project being reviewed on surveying displays some of the successful methods towards conducting and administering a survey to meet the minimum response rate needed for viable information to analyze, that the group has already completed, as well as plans on completing in further steps in our project.

Review #8: "Survey Questions 101: Do You Make any of These 7 Question Writing Mistakes?" [8]

It is important that a survey does not include any commonly made mistakes. Within this article are some very basic principles when it comes to the structure of most survey questions. There are certain parts of the article that apply to this IQP's survey while others do not:

- The article begins with stressing the importance of careful wording. Seemingly innocuous words can bend survey questions into forcing a particular answer. This includes words from all parts of speech. Adjectives are the most obvious, but there are also verbs and nouns that have connotations which will influence the result of the question. The best way to avoid this is to use as few adjectives as possible as well as being careful to use only unbiased words.

- Giving mutually exclusive choices is essential. This is a much more concrete problem that can be fixed by making sure that if there are multiple possible "correct" answers, then they should all be selectable.

- The questions should not be vague or unclear. The most common occurrence of this problem is within open-ended questions. Without limiting the respondents to a set selection of answers, the wide range of responses may lead to useless data.

- The fourth point is not very relevant to our survey, as it is that "Prefer not to Answer" should be a possible answer to sensitive questions. However, it isn't very relevant because we have no questions which are sensitive.

- Failing to cover all possible answer choices is disastrous for a survey. It notes that if "other" has been selected more than 10% of the time for a multiple choice question then there are probably one or multiple missing options. This is one problem which the team has had much difficulty with. However, the group has have attempted to addresses this problem by running test surveys and incorporating in the responses received from written-in choices.

- Scales and how they should be balanced are other important aspects of survey construction. By this it means that when making scales, the use of all positive words should be avoided. For example: "rate this question with one of the following: good, great, and excellent," is not a balanced question because there can only be positive answers. The choices that should be possible need to include both negative and positive, for example: "rate this question with one of the following: bad, mediocre, and good." This is very important; however, the only scales in our survey are numerical from zero to

ten. While the value of the numbers may be abstract, it includes the lowest choice as well as the highest choice in unbiased fashions.

- The final point which is addressed is that each question should only ask one question at a time. This is relatively straightforward, but it also states that if it is absolutely necessary, than it is important to include all possible choices for each question within the question.

Review #9: "Approaches to the Analysis of Survey Data" [9]

When answering questions through means of the implementation of surveys, having adequate data and proper analysis techniques is essential. The 2001 article from The University of Reading Statistical Services Centre "Approaches to the Analysis of Survey Data" outlines the necessities for proper survey analysis in a very informative and practical manner. This article emphasizes the importance of insuring that the data relevant to the question which is being asked is being collected, and that said data are being appropriately processed and presented.

Proper data analysis for survey results consist of three main stages: exploratory data analysis, deriving the main findings, and archiving. Early stages of the data collection process for the survey are a prime time for exploratory data analysis, which is the process of using early data collections to "tweak" questions to ensure that the data collected is relevant to the questions which the survey is attempting to answer. Once data collection has been completed, deriving the main findings of the survey must occur. Essentially this stage in the process calls for proper presentation and summarization of the collected data so that it may be properly referenced in future applications. When the questions have been fully optimized and the findings have been properly recorded, archiving the entire process leading up the hopefully successful data

collection must be documented. Archiving helps solidify the overall presentation and purpose behind the implementation of the survey and the data collected from said survey.

This article also mentions other key aspects behind the implementation of surveys. There are flaws with data collection in reference to having questions sets which are only available pending how you answer previous questions. In some cases having set ups like this can make it more difficult to collect the proper data from an evenly represented demographic. Besides addressing the difficulties of reaching the necessary response rate for all categories, strategies for organizing and analyzing data from questions with multiple responses are highlighted. Computerized spreadsheets are an excellent way to create tables which can compare the responses subjects had to two different questions in order to derive if certain "sub-groups" within the sample population were present.

Overall, this article was only slightly useful towards the work on the survey being constructed to judge WPI's student's feelings on the humanities and arts requirements.   Most of the problems with data collection and analysis which are brought up in the article are solved through the use of the Qualatrics survey administrative software. However, the information presented here did confirmed that the general direction of the survey construction and hypothesized methods of data collection and analysis is well structure and has potential to yield much interesting data on students opinions of the HUA.

Review#10: "A Survey and Best Practices Guide to University Involvement in FIRST" [10]

This review is about a previous IQP that was completed on determining some of the causes and ways that universities become involved with FIRST. This IQP was found by

searching the online database of IQPs – the Electronic Projects Collection – and by searching

with the keyword 'survey'. This IQP was among many others related to surveys; however this

one was found to be especially relevant because of its in-depth analysis of their survey creation

process and their methodology for distributing the survey.

 In particular, the relevant sections that are discussed were:

- Determining the objectives of the survey.

- Determining how to best administer the survey.

- Developing appropriate questions.

- Soliciting responses.

Determining the objectives of the survey is significant because it is crucial that a purpose

is understood before beginning creation of the survey in order to ensure that the survey is created

to answer specific questions and to fulfill the objective. Determining how to best administer the

survey is important because ideal distribution of the survey will help return the greatest number

of responses, and this will in turn increase the degree of confidence in the accuracy of the

obtained results. Developing appropriate questions is also critical because if the questions asked

in the survey are not explicitly related to the objective of the survey, then there will be irrelevant

data that cannot be used, and this will also cause the survey to be unnecessarily longer which

could likely result in less responses being delivered, as the length of the survey will sometimes

turn away potential responders. Lastly, soliciting responses is important because it provides a

basis on how to ensure that those who are sent the survey will actually take the time to read and

respond to it, and this will of course be beneficial because it will increase the number of obtained responses.

Review#11: "Conducting an Effective Housing Survey to Inform Planning in the Royal Borough of Kingston Upon Thames" [11]

This literature review is about a previous IQP that was completed on gathering information about residents in new housing developments in a particular area in order to provide data to local services and to create recommendations for future developments. This IQP was found by searching the online database of IQPs – the Electronic Projects Collection – and by searching with the keyword 'survey'. This IQP was among many others related to surveys; however this one was found to be especially helpful because of its investigation and comparison of various types of surveys – specifically concerning distribution methods – and because of its use of numerous case studies regarding the successes and failures of past surveys. More specifically, the most significant survey distribution methods analyzed included:

- Face-to-face
  - Pros: Generally higher response rates, allow the respondents to comment or ask questions about any of the questions in the survey.
  - Cons: Extremely inefficient.
- Through traditional mail
  - Pros: Larger distribution population available, very efficient.
  - Cons: Small cost for postage, lower response rates.

- Through e-mail

  - Pros: Extremely efficient, large populations available (100% of target audience for undergraduates at WPI).

  - Cons: Lower response rates, technical difficulties.

- Using web applications

  - Pros: Graphics/ animations to increase reader interest, question filtering/ display logic.

  - Must be sent out through other medium, technical difficulties, lower response rates.

- Through text messages

  - Pros: Large populations available, often convenient for respondents.

  - Cons: Not realistic for lengthier surveys.

In general, the information found in this IQP was not only found to be relevant but also applicable. The conclusion made by this IQP group – to use a combination of distribution methods – appears to be appropriate, so all methods for distribution of the survey will be carefully considered.

Review #12: "Affordable Survey Incentives That Motivate Your Respondents." [17]

The article "Affordable Survey Incentives That Motivate Your Respondents" talks about what types of incentives are the most effective for an increased response rate. In the article, there are two drastically different types of incentives for the best response rates. The first one discussed is giving every survey taker a very small reward, such as a $2.00 Red Box movie

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rental. Although this might be beneficial for other surveys, for the purpose of this survey, this first method is not one desired. First off, the budget for incentives given to the group is $500. With needing 350 responses and the possibility of receiving more, this puts at least $200 debt on the group to ensure every individual obtains their incentive. The second reason that this type of incentive would not work for this survey is because WPI is a school that consists of tech savvy individuals. Thus, they all know how to watch a desired movie without owning it.

The other incentive type, as mentioned in the article, that the team chose was a lottery incentive. Lottery incentives typically consist of fewer prizes but of higher value. Thus, the group decided on ten $50.00 Amazon gift cards. They can be used to buy almost anything, and it is a significant amount of money. This worked out in the group's favor because the number of responses is never fully known, and the process of making sure individuals who get entitled to get incentives is easier. Giving out 350 incentives versus 10 is significantly easier for the group members.

Using the lottery incentive method proved to be successful because the team achieved the goal of 350+ responses despite the challenge of not being able to ensure that the survey was given to every WPI undergraduate student.

Review #13: "Single-Group Statistical Tests with a Binary Dependent Variable"[20]

The article "Single-Group Statistical Tests with a Binary Dependent Variable" focuses on the different statistical methods used for analyzing data, similar to the data obtained from the group's survey. Tests described in the article are to determine if there are more "yes" than "no"

responses. In correlation to the team's data, this would be if there are more sincere versus insincere responses, as well as the specific first question of whether or not students understood the Humanities and Arts or the Social Science requirements.

For the survey, the desired statistical confidence was to be 95%, for data to be determined accurate. The described t-test aids in figuring out the range of statistical confidence. Using the information in this article, once the data were entirely received, the team calculated various intervals for statistical analysis throughout the survey. The article described not only how to calculate the initial tests of significance, but also the resulting confidence intervals. It also specifies how to determine whether or not a calculated p-value (resulting from the test of significance) or a calculated confidence interval indicates statistically significant data. This article advises to use p-values of less than 0.10 and 90%+ confidence intervals. For example, the question of whether or not students understood the Social Science requirement had a confidence interval of 98%-99%, so this ensures that the data received on this question is statistically significant and therefore hypotheses can be safely concluded (with a 2% assumed error) for that question.

Thus, the data can be determined to be accurate in reflecting the experiences and attitudes of students taking the humanities and arts and social science requirements. This was expected because the desired number, as stated from previous research, of respondents for 95% was 350, which the group exceeded.

Review #14: "Tests for Significance"[21]

The article "Tests for Significance" breaks down the three reasons for using a t-test to analyze data. These reasons are: 1) to test whether there are differences between two groups on the same variable, based on the mean (average) value of that variable for each group, 2) to test whether a group's mean (average) value is greater or less than some standard, and 3) to test whether the same group has different mean (average) scores on different variables. From this information, all three categories can be applied to our data. For example, for the first reason, the different groups can be genders, majors, or grade levels focused on the same social science class. For the second reason, for example, the percentage of people who responded that they do not understand the Humanities and Arts or Social Science requirement can be compared to 0%. For the third reason, for example, mechanical engineers can have different thoughts and feelings towards the music humanities and arts classes.

Reading on in the article, there are five aspects to calculate the value of t. These aspects are: a) state the research hypothesis, b) state the null hypothesis, c) stipulate whether the t-test will be a one-tailed test or a two-tailed test for significance, d) select the level of alpha, and e) calculate t. For the purposes of the group's project, b and e were used. As an example, the first question of whether or not the students understood the Social Science requirement, the null hypothesis could be that the number of students who responded 'no' (that they did not understand) was not statistically different from 0. This article describes the process of calculating the t-test which was used in the results to obtain a value that was statistically significant, which shows that the number of students who responded 'no' was in fact statistically different from 0%.

The final step towards the aspects to calculate the t-value consist of five steps within itself. These steps are: 1) subtract the mean of the second group from the mean of the first group, 2) calculate, for each group, the variance divided by the number of observations minus 1, 3) add the results obtained for each group in step two together, 4) take the square root of the results of step three, and 5) divide the results of step one by the results of step four. Applying this to the data, the t value was calculated as seen in the results.

Thus, throughout the results, it can be seen that the t-values calculated reflects the fact that the data the team collected is accurate for determining the experiences and attitudes towards the humanities and arts and social science requirements of WPI undergraduates.

METHODOLOGY

Project Work

The project group has weekly meetings among the team, along with the weekly meetings with the academic advisors, in which research efforts are shared and discussed and meeting minutes are composed. During A-term, these group meetings resulted in brainstorming sessions aimed at drafting the questions which make up the survey. The literature reviews and parts of the methodology section were composed in this term as well. For B-term, the majority of the group's efforts have been directed towards getting responses to the survey. As for the report itself, a great deal of individual research and writing was performed individually outside of meetings towards the methodology section. C-term, the final term for the project, was spent consolidating and analyzing data. The Results and Analysis, Conclusions, Recommendations, and Future Projects sections, more literature reviews, and further minor revisions were also completed during this term.

Survey Creation

When considering how to create the survey, a few methods were examined. A paper survey created without survey software was the least likely to be used due to the necessity and difficulty of physical distribution and physical data tabulation, as well as using a large volume of paper. Although handing out surveys in a classroom when given permission would have resulted in more results, the survey relies heavily on skip logic, which translated to paper, is very difficult

to complete in a short period of time, as well as almost impossible to understand. If the paper

method was used, the survey would have to be written completely differently, but the skip logic

of Qualtrics is what helps maximize the amount of useful, detailed data collected. Also, by

giving a paper survey out, students entering the raffle would prove to be difficult because there is

no easy way for them to enter while keeping it anonymous. The website SurveyMonkey is a

common digital survey distribution method, but has limiting features unless a "Pro" subscription

is paid for. Along with having to pay for a subscription, SurveyMoney does not provide skip

logic as Qualtrics does. Even though it is the most well-known software for surveys, it is not

beneficial to the type of survey the team needed to create. The only advantage that could be seen

is that it is well known so individuals might trust it more, but the survey would be inconvenient

to complete, due to the fact that the student would have to skip to certain questions on their own

based on their answers. The software the group decided on was Qualtrics which is both versatile

and user friendly. The survey creation suite that Qualtrics provides is intuitive and allows for

complex question skipping logic, which was used extensively. Equally as important, there is a

collaboration feature which allows for changes to be made to the survey by multiple contributors

simultaneously. The software also allows for a wide variety of options once data are collected.

This includes being able to being able to perform data correlations and show answers to certain

based on how other questions were answered (this is called drilling down in the software). Also,

Qualtrics allows for data to be exported in PDF, Excel and Word document file types. Qualtrics

requires a paid license to use; however WPI has purchased one which allows all students to use

it.

Limitations

Throughout the course of the creation and distribution of the survey, several limitations arose. The following is a list of the restrictions which the group had to overcome in order to successfully complete the project:

- Making sure that the wording of the questions was easily understandable.
  - Involved much editing and re-editing of the questions.
- Ensuring that there were not too many questions, thus making the survey too long and causing participants to lose interest before finishing.
  - Involved many hours of brainstorming and the use of test subjects to ensure that the data that would be collected would allow the group to make concrete statements towards the end of the project.
- Having the questions be in a logical order which would not confuse the participant.
  - Required the use of test subjects opinions on the survey as it was developed.
- Due to recent changes within the SGA's bylaws, the group was unable to contact every undergraduate, which resulted in no decent way of being able to determine a response rate for the survey.
  - This problem was addressed by the group utilizing any WPI email alias which they were on, social media contacts, and approaching people in the WPI Campus Center in order to acquire participants.

Subjects and Sample Demographic [16]

For the purposes of this project, the undergraduate community at WPI was the target subject group for the survey. The demographic data which was collected using the survey was compared to the actual demographics of WPI using the WPI Fact Book. One problem which was presented by this subject pool was the inability of the group to give every undergraduate the opportunity to take the survey. Due to this problem, there was no actual way to determine a response rate for the survey. The only way in which this would have been remotely possible would have been for the group members to cross reference all the people on the email aliases which they presented the survey to with all the social media contacts they made. This would have proved to have been a very time consuming tasks which in the end would have not provided any truly significant/necessary input to the project. These trials and tribulations will be mentioned further on in the Methodology section.

Question Justifications

Below is every question included in the current draft of the survey with an explanation for why it was included:

- Do you believe you are aware of the requirements of the social sciences program at WPI?
    - Checking efficacy of informational distribution regarding the program.

- How many social science classes have you taken or are currently enrolled in at WPI? (Includes Psychology, Economics, Environmental Studies, Political Science and Law, Sociology, and System Dynamics.)
  - Establishing how many SS classes to ask about
- Why did you choose the first social science class that you've taken?
  - Find motivations behind taking SS classes
- Why did you choose the second social science class that you've taken (answer all that apply)?
  - Checking if motivations changed after having already taken one class
- If you did take 3 or more social sciences, why?
  - Identifying reasons for taking more than three SS
- For the first class that you took, rate the following with 0 being the lowest and 10 being the highest:
  - How much did you think you would enjoy the class?
  - How much did you enjoy the class?
    - Evaluates expectations vs. reality regarding enjoyment of the class.
  - How much did you learn in the class?
    - Evaluates perceived value of the class.
  - How much work did you do for the class?
    - Evaluates workload of the class (do people see SS classes as more work than other classes).
  - How useful was the material you learned in this class?
    - Evaluates the applicability of the class.

- For the second class that you took, rate the following with 0 being the lowest and 10 being the highest.

    o Check if the student had a different experience after taking their first class.

- Do you believe you are aware of the requirements of the Humanities and Arts program at WPI?

    o Checking efficacy of informational distribution regarding the program

- How many humanities classes have you taken or are currently enrolled in at WPI? (Includes American Studies, Art & Art History, Drama & Theater, English, History, Literature, Modern Languages, Music, Philosophy & Religion, Writing & Rhetoric.) This does NOT include a seminar or practicum.

    o Establishing how many classes to ask about.

- Have you chosen your intended depth, or already completed your depth? If yes, please specify what it is in.

    o Establishing whether or not to ask questions about depth/practicum/seminar

- Why did you choose that particular depth?

    o Finds motivation behind choosing a particular depth.

- For your humanities class, please rate it in the following categories, with 0 being the lowest and 10 being the highest.

    o This was added for people who have only taken one humanities class.

- For your favorite humanities class, please rate it in the following categories with 0 being the lowest and 10 being the highest.

- For your least favorite humanities class, please rate it in the following categories, with 0 being the lowest and 10 being the highest.

- These slider questions evaluate aspects of the extremes since it would be time consuming and ineffective to rate every class.

- Have you taken a seminar or practicum?

  - Checks whether or not to ask about a seminar/practicum.

- For your seminar or practicum, please rate the following with 0 being the lowest and 10 being the highest.

  - Evaluates aspects of the seminar/practicum.

- Besides the credit requirement, why did you take/ do you plan on taking humanities/social science classes?

  - Evaluates reasoning behind taking the classes.

- Did you find the humanities classes useful for any of the following? (if you haven't completed one or more, please indicate so).

    - Did you take or are you planning on taking your humanities classes because you think they might help you with IQP, MQP, an internship/ job, or other?

    - Did you find the social science classes useful for any of the following? (if you haven't completed one or more, please indicate so).

    - Did you take or are you planning on taking your social science classes because you think they might help you with IQP, MQP, an internship/ job, or other?

      - Checking for future planning regarding classes for a more elaborate form of explanation for why they registered for them.

- Did WPI's Humanities & Arts or Social Sciences programs influence your decision to attend WPI?

  - Whether or not the programs are known about and influential to prospective students.

- What is your gender?

  - Distribution testing.

    - For this question, the option of "Other" was added on top of Male and Female to accommodate for those who it may apply to.

- What Year student are you?

  - Distribution testing.

- Are you a WPI student? Slide to 10 if yes or 0 if no.

  - Testing to make sure the answers given are sincere and that the survey taker is paying attention.

- How many majors do you plan on declaring?

  - Asking for next question.

- What is your 1st Major?

  - Major to Interest correlation.

- What is your 2nd Major?

  - For double majors.

- Do you plan on minoring in a humanities or social science program?

  - Testing for influence from enjoyment of HUA/SS classes.

- What is your planned minor?

  - "Other" entry for previous question.

These questions chosen and inserted into the survey relate to the goals of the survey because they reflect what type of information the group wants to obtain. For example, finding motivation behind why students take Social Science classes, as asked in question 3 above, helps establish a basis of their opinion of the classes before taking them. For students who have taken more than one Social Science class, asking why they took the second class is a way of finding out if their motivation changed, thus getting insight on their experience and attitude from the first class taken. Every question asked is towards getting results on the goal, which is finding out the experiences and attitudes of the students who completed any aspect of the Humanities & Arts and Social Science requirements. Asking levels of enjoyment, for example, is a prime way to discover this, as another example.

Pre-Distribution Testing

In order to improve the survey prior to launch, various iterations of the survey were distributed to a small sample of individuals consisting of 1 sophomore, 7 juniors, and 2 seniors at WPI. Using their detailed responses both within and outside of the survey, changes were made. These changes included adding options to certain questions, clearing up wording for certain questions, and overall formatting/order changes. Minor skip logic was added, options for drop down menus were added, and the reasons for taking classes were edited. Also, some subjects reported giving up on the survey because it was too long. Partial responses are valuable if they are sincere, but at least one subject reported giving insincere answers as a way of finishing the survey faster. This is more deleterious to the results than if they had not answered at all because

it may give misleading results that lead us to a false conclusion. As a result of this occurring, the "Are you a WPI student? Slide to 10 if yes or 0 if no." question was added as a slider so that the survey taker would have to be paying attention in order to answer properly. After further testing this question was changed to "Are you a WPI student? Slide to 80 if yes or 0 if no. The purpose of this question is to make sure that you are paying attention." Hopefully this will indicate if any response sets are insincere.

Completion Incentive

As an incentive for completing the survey, students were given a chance to enter a raffle to win one of several prizes. The prize for the raffle was 1 of 10 $50 Amazon gift cards. As for implementation of this raffle, there was a separate link given at the end of the survey which led the participant into a completely separate survey in which they entered their email for entry into the raffle. It was made clear that there was no association between the informational survey and the raffle survey. The raffle was held on the last day of B-term, December 19th, 2013.

Survey Implementation

It was planned for the email (Appendix F) to be sent to all undergraduates at undergraduates@wpi.edu on the first Monday of B-term. The email was sent but subsequently rejected due to changes made to the alias' moderation policy by the SGA (Appendix G). These

changes were made at the beginning of B-Term and included the line: "As of this time project group surveys will not be accepted." Due to this, our survey was only distributed using our alternate methods.

The major form of distribution of the survey was through the use of social media. More specifically, the first stage of distribution was a Facebook Status which led to 46 responses out of a pool of approximately 100 eligible participants. The next stage of distribution included the survey being sent to multiple sorority and fraternity email aliases. This led to 90 responses out of a pool of approximately 500 (with around 60 of that pool overlapping with the first pool). Additionally, the survey was posted to various Facebook groups that resulted in some additional responses, although the pools overlapped more and more from previous posts and so a smaller pool of new potential respondents were targeted.

After a week or two, the survey was then sent to a few email aliases which consisted of mostly no new target audiences, but the reason for sending it out again was because if people missed it the first time, they might take it now, and if they had seen it but not taken it, they may take it this time for a number of reasons. More specifically, if they had not had time to take it the first time they saw it, they may take it now, or if they had not been interested the first time, they may now be more interested in the raffle prize, or they may feel more obliged to help out their fellow classmates in need.

Another method used for getting the survey spread throughout campus was asking the Humanities &Arts and Social Science faculty to email and pass the survey onto their classes. This proved to be successful because several students took the survey upon being informed it was available and emailed out to them from their professors. One of the students in the group

talked to two classes explaining the survey and asking them to take it, as an extra emphasis on the importance of it. All these methods combined helped the team to achieve the desired goal of 350 responses.

Incentive Determination [17]

The prizes that were chosen as the incentives for completing the survey were ten $50 Amazon gift cards. This prize was selected because it is essentially a widely (at least in respect to the target population of this survey) acceptable substitute for cash, and therefore would be desired as a prize by the vast majority of participants as opposed to if a specific prize were selected, such as a $500 new gaming console, which would only appeal to a certain demographic within the population. The reasons that the Amazon gift cards were chosen as opposed to hard cash is that there is more flexibility in actually delivering the gift cards to the winners, and because it is more easily documented and verified as being successfully delivered to the intended recipient than cash. More specifically, the flexibility aspect is important because some winners may want a physical Amazon gift card to be given directly to them, whereas others may want an online code for an Amazon gift card to be sent to them electronically, and either method, and others, are possible with Amazon gift cards where they may not be possible with cash. Additionally, the documentation aspect is significant because with cash, it would be easy for someone to try and take advantage of the system by claiming they had never received the cash, even after having actually obtaining it, but with Amazon gift cards this would be much more

difficult as there would be receipts and/ or electronic documentation of where the gift card is being sent.

The ten gift cards, each with a $50 value, were decided upon as the prizes because various research pointed to a combination of methods when considering the actual incentives for a survey. For example, it was found that in many cases a guaranteed reward for completing a survey resulted in a higher response rate than a raffle reward. This was true even for situations when the guaranteed reward might be $2 - $5 dollars for each respondent, whereas the raffle reward might be a few hundred dollars. However, an exact replication of this system was not feasible for this project's survey partly because the budget was not quite high enough (at least $700 – $1,750 would have been required) and because too many problems could arise when trying to deliver cash to every single respondent, especially when the survey was administered online so it cannot simply be handed to the respondent upon completion. Other research mentioned in the literature review section also suggested that when using a raffle incentive with a single winner, there is a cap at which increasing the value of the prize further does not actually increase the response rate. These two strategies were incorporated into the incentive by using the first strategy to determine that there should be multiple winners and by using the second strategy to determine that the value of the prizes should not be too high.

Raffle Winner Determination

In order to distribute the prizes to the winners by the end of B term, a deadline for the raffle was determined to be December 18th at midnight. At this time, the responses from the

raffle survey, which was a list of the emails of all respondents interested in the raffle, were

placed in a numbered list in a Microsoft Excel file. The email addresses were numbered 1

through 201, and then a random number generator was used to determine the ten winners. This

was done using a TI-83 calculator, using the randInt function, using an interval of (1, 201).

RandInt(1, 201) was run 10 times, and the ten numbers that were randomly chosen corresponded

to the ten winners on the excel file.

Prize Distribution

Once the winners were determined, the simplest method of distributing the prizes was to

put each one in the recipient's WPI mailbox. Use of the WPI directory helped here, as knowing

their emails allowed their WPI mailbox numbers to be determined using a simple WPI search.

With this knowledge, it was easy to simply put each Amazon gift card in the owner's mailbox,

and then to send each recipient an email letting them know that their prize was in their mailbox.

Trial and Error

When the survey was completed and ready to be sent to the undergraduate alias in order

to obtain survey results, the group discovered a new policy that would hinder this premeditated

method. The Student Government Association, at the beginning of B term, changed a handful of

their policies. One of the policies changed prohibits any type of survey relative to anything (IQP,

MQP, etc.) to be sent out to the undergraduate alias, in an attempt to eliminate as much spam as

possible. Due to this setback, the team had to brainstorm multiple new ideas to achieve the goal of 350 responses.

One of the members of the group attempted to email all the undergraduate students without going through the alias. This group member created a mail merge under Outlook Exchange email that WPI uses. A mail merge was created, and every single email on the global network drive was filtered through in order to eliminate emailing faculty and staff. This process took about three hours. In total, there were a little over four thousand email addresses, representing the population of undergraduate students. The email text that was originally submitted for SGA approval was placed into an email, and the mail merge was selected. However, when the email was sent, a message from the student sending it was received.

Outlook Exchange only allows for up to one thousand email recipients to be emailed at once. This proved to be a problem due to the fact that the mail merge was over four thousand individuals. The email received from the student was that the email to everyone on the mail merge was not sent. It took about an hour to discover that the issue was the one thousand maximum recipient fact of the email program. An estimate of nine hours was put into trying to resolve the mail merge situation. However, there was no way to move the emails from the mail merge and then separate them into different subgroups of one thousand students in order to successfully email the undergraduate class. Thus, different methods discussed were used to obtain the number of responses required, based on research.

RESULTS AND ANALYSIS

General Approach [16]

By the preset deadline of December 19th 2013, the survey had reached 438 overall

attempts at the survey, with 341 of those responses being 100% completed runs of the survey.

While it was stated earlier in the report that 350 responses would be necessary for the data to

provide any statistically significant, using both the 341 completed responses and the responses

from the incomplete surveys gives enough data , thus putting the survey over its pre-determined

need for responses.

Besides insuring that there were simply enough responses, the sample demographic of the

survey respondents had to be similar to that of WPI. For the purposes of this project and the data

collected, the male to female ratio was used to compare demographics. Using the WPI Factbook,

it was found that WPI's undergraduate population is 67.40% male and 32.6% female. After

cutting out the select few graduate student responses, it was found that the sample demographic

of the survey was 52.02% male, 47.40% female, and .58% "other". While there seems to be

roughly a 15% difference in the demographics, for the purposes of the questions being analyzed

it is accurate enough representation of the WPI community. There is however potentially an

explanation as to why the ratio of males to females was smaller in the sample demographic than

that of WPI as a whole, which is due to the survey being sent out to several of the campus's'

sororities' email aliases.

Additionally, the responses gathered for the survey were not able to be gathered in a

typical simple random sampling method. This is because for this application, with the limitations

in mind, it is not practical or feasible to reach out to a random sample of undergraduate students and obtain the necessary amount of responses in the desired time frame using the available reward. For example, if 350 undergraduates had been chosen in a simple random sampling method, and they had each been sent an email asking to take the survey, the number of responses gathered would not have been enough to obtain statistically significant data. For this reason, all means available were used to reach out to students who were known by the IQP partners in order to increase the response rate. However, this directly led to certain forms of response bias, in that the vast majority of students who responded were students that one or more of the IQP students knew. For example, there were much more juniors who replied to the survey than any other year student – this is because the IQP students are all juniors, so the majority of students known to them were also juniors. Additionally, since three of the four members of the IQP team are involved in Greek life, a large proportion of respondents were Greek as well. These various biases could have possibly led to different correlations within the results, but there is no real way to tell for certain if or what these correlations were without the presence of a control group, which is not possible in this project.

Following the completion of the data collection, the analysis of the data began and was conducted using the following steps:

- A list of key questions which could be potentially answered by the responses to the survey was drafted and finalized. These questions were also split into different categories based on which type of questions in the survey they related to.

- For some of the questions purposed above, statistical tests needed to be applied to the response data, while some conclusions were easily achieved by simply looking graphs made of the response data to two separate questions.

Lack of Response Rate

The response rate in this project is not precisely identifiable, as there is no way to go about determining exactly how many students saw the survey. There are a few reasons why this is the case, first and foremost is the fact that social media was heavily used to reach out to potential respondents. The use of social media, for example Facebook, means that while there may have been a total of X number of students who are Facebook friends with the four IQP members, and therefore were able to see the Facebook request to complete the survey, but this does not mean for sure that all X of those students in fact saw that request. There are numerous reasons why this is true, for instance if a student had not logged into Facebook for a few days during which the requests were sent out, then that student would have never known about the survey and should not be counted in the determination of the response rate. In addition to the social media factor, there is no way to determine how many students were reached while attempting to find respondents in the Campus Center. This is most importantly true because there is no way to know how many students entered the Campus Center during the times at which the IQP members were there, but there are also the factors such as whether students passed by the IQP members and saw the survey and chose not to answer it, or whether they never even saw the survey and just happened to walk by.

Questions of Interest

The following was a list of questions which the project team hoped to answer using the data collected from the survey.

1. Basic
    a. Is there a significant number of students who do not understand the humanities and arts or the social science requirements?
2. Expectations
    a. Was the change between the students' expectations of how much they would enjoy a class and how much they actually ended up enjoying that class significantly different for classes in different departments?
3. Attitudes
    a. What are the primary reasons students displayed for choosing the social science classes and the humanities and arts classes (and depth) that they chose?
4. (Anticipated Outcomes/Benefits)
    a. Did a significant number of students take social science classes with the specific intent of it helping them with a project, a job, or anything else they had in mind?
    b. Did a significant number of students take humanities and arts classes with the specific intent of it helping them with a project, a job, or anything else they had in mind?
5. (Other/Abstract)

a. For any of the preceding questions, is there a significant difference when comparing the results of each discipline separately?

b. Are there any types of recurring suggestions for the Humanities and Arts or the Social Science departments?

Results [20], [21]

Various questions from the survey were analyzed using Qualtrics' statistical analysis tools as well as some manual methods.

Social Sciences		
Answer	Response	%
Yes	368	85%
No	65	15%
Humanities and Arts		
Answer	Response	%
Yes	351	97%
No	12	3%

Table 1: "Do you believe you are aware of the _____ requirement at WPI?"
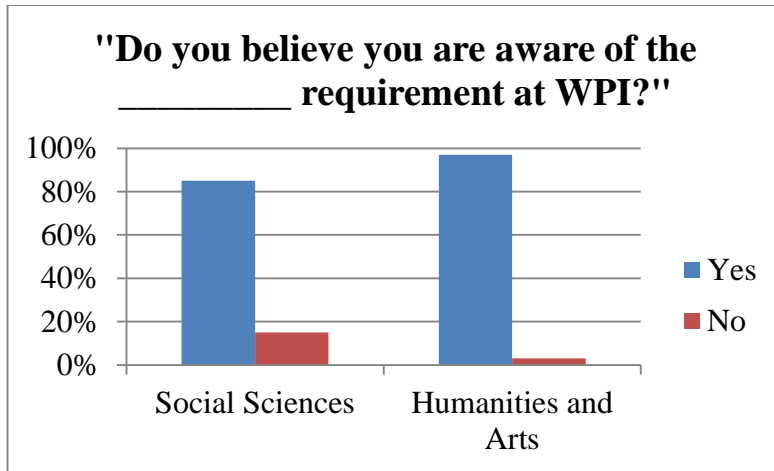
Statistic	Value
Min Value	1
Max Value	2
Mean	1.15
Variance	0.13
Standard Deviation	0.36
Total Responses	433

Figure 1: "Do you believe you are aware of the _____ requirement at WPI?" and accompanying statistics.

As seen in Figure 1 and Table 1 there is a noticeable difference between people knowing the requirements of the Social Sciences program and the Humanities and Arts program. Additionally, the number of 'no's for knowing the social science requirement is statistically different from 0 'no's, which shows that the number of people who do not understand the social science requirement is in fact statistically significant. This was determined by doing a t-test of significance, as is illustrated below.

$t = (x - u)/s$

Where t is the t-value, x is the sample mean, u is the null hypothesis, and s is the sample standard deviation.

The equation yields t = (1.15-2)/0.36 = 2.361. From a standard t-value chart which presents a confidence interval for any given t-value, the confidence interval that is associated with 2.361 (and with a degree of freedom of $(368 + 65 - 2 = 431)$) is between 95% and 98%. Therefore, we can be between 95% and 98% confident that the amount of responses that said 'no' is not the same as if no one had said 'no'. In other words, we can be reasonably confident that there is a significant number of students who are not aware of the requirements of the social science requirements. Figure 2 breaks down these answers by class year.
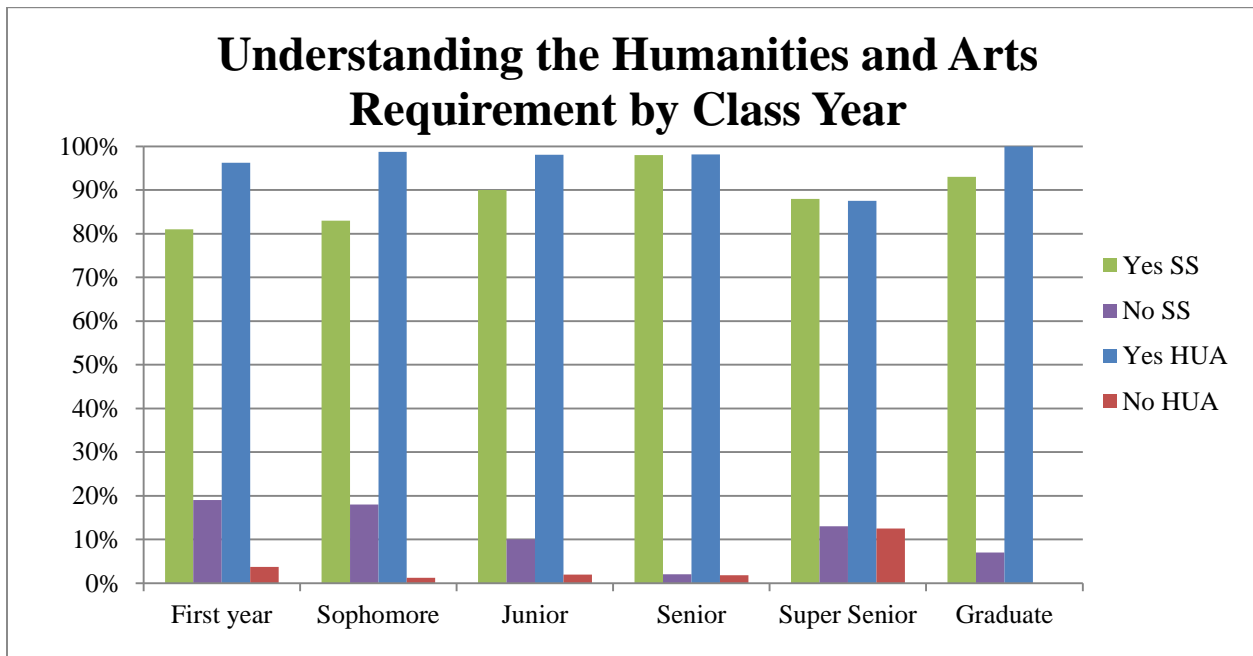
Figure 2: "Do you believe you are aware of the _____ requirement at WPI?" organized by class year.

The more years of school that are completed, the more aware of the requirements of each

program the students are. Super seniors and graduate students are an exception but their sample

size was too low for this to be significant.

Figures 3 and 4 show the reasons students gave for taking the social science classes they took.

Reasons for Taking Social Science Classes by Percent
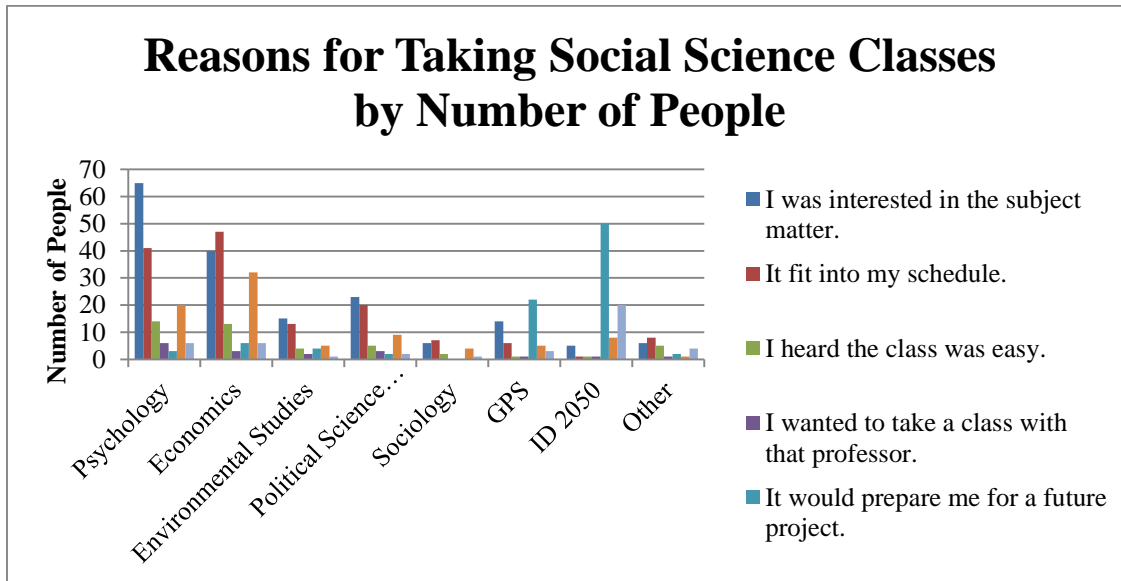
Figure 4: Reasons for taking Social Sciences classes quantified by percent within each subject

Figures 5 and 6 show the reasons students gave for taking the humanities and arts classes they took.
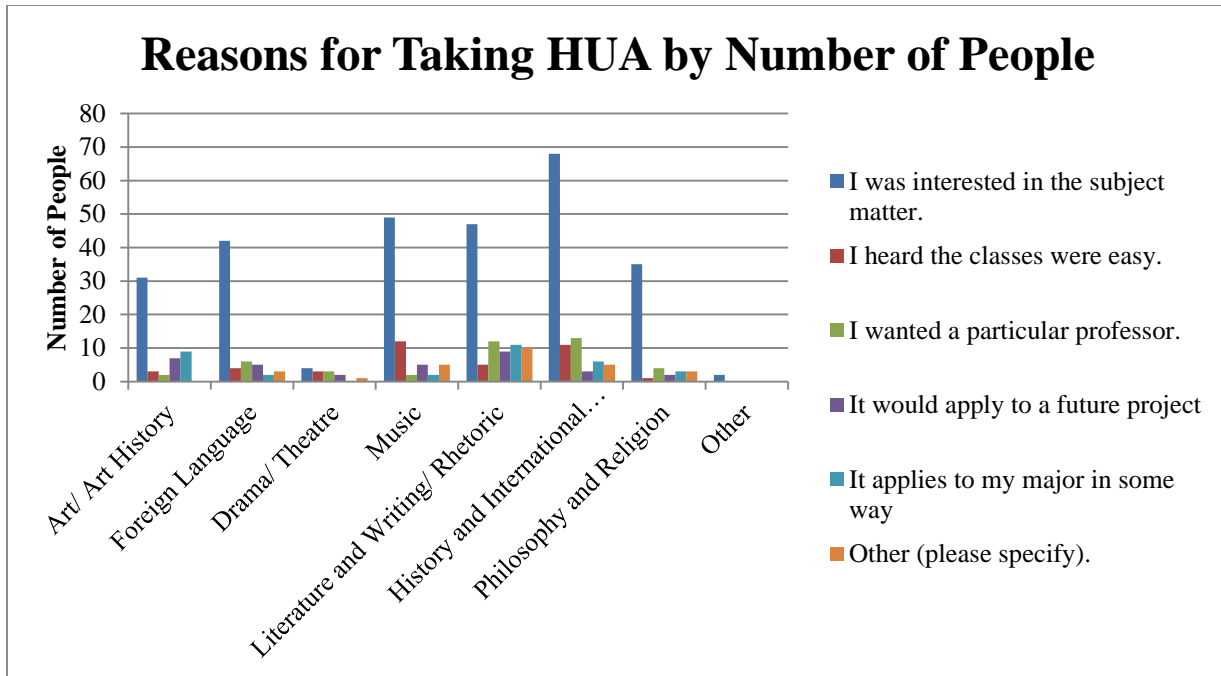
Figure 5: Reasons for taking Humanities and Arts classes quantified by number of people
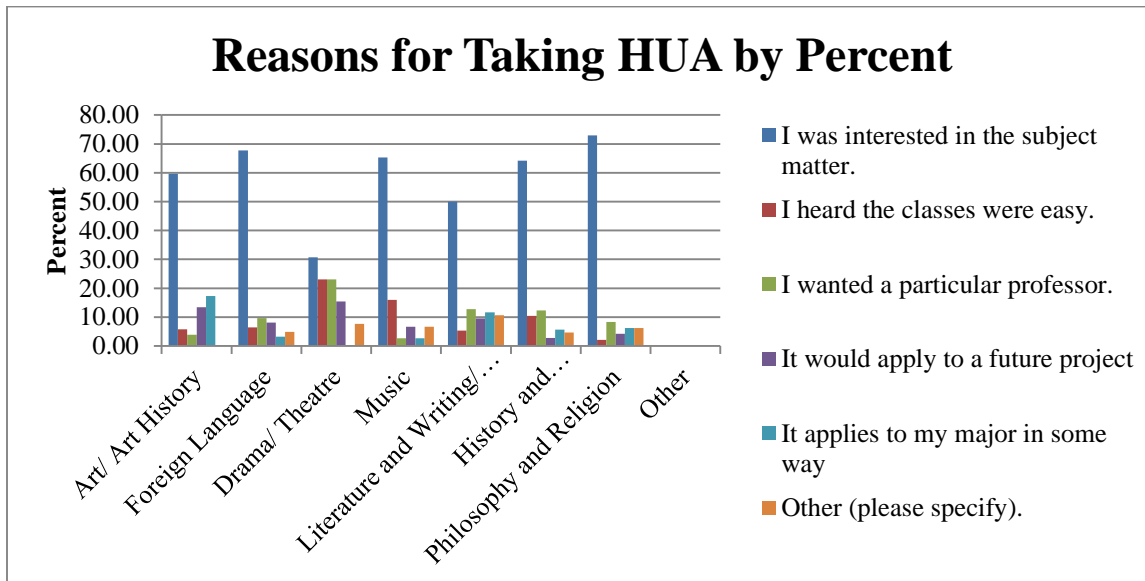
Figure 6: Reasons for taking Humanities and Arts classes quantified by percent within each subject

Figures 3, 4, 5, and 6 all show that students take classes because they are interested in the subject matter. There are some exceptions, such as Economics in which more students took it because it fit into their schedule rather than them being interested in it.

Figure 7 shows the favorite humanities and arts classes of students organized by major area.
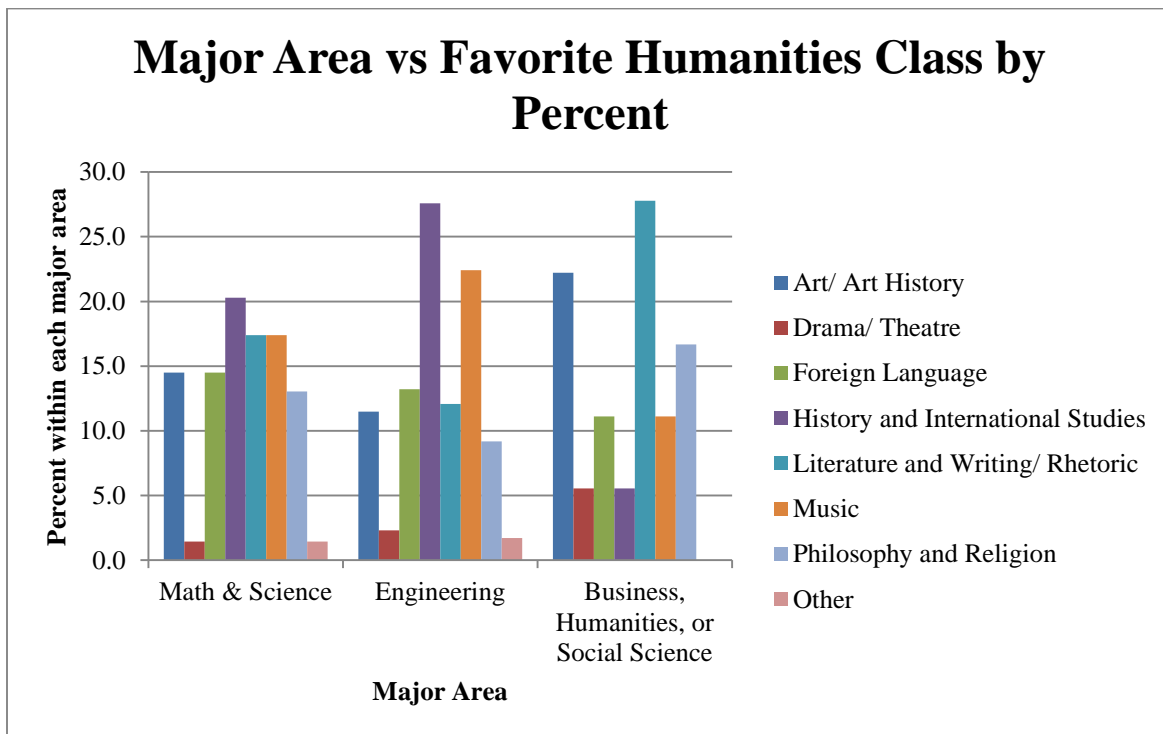
Figure 7: Favorite HUA Class by Major Areas

Figure 8 shows the least favorite humanities and arts classes of students organized by major area.
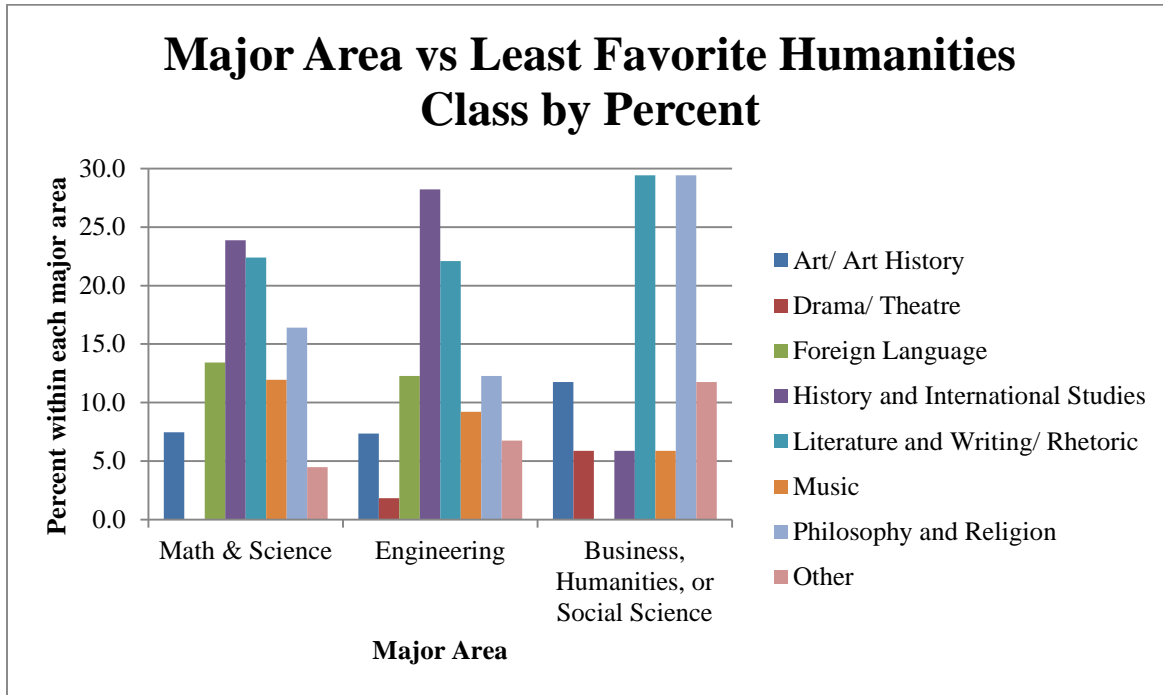
Figure 8: Least Favorite HUA Class by Major Areas

Figures 7 and 8 show that Math & Science majors take a wider range of humanities and arts classes than the other major areas. A large number of Engineering majors take history classes, but it is even in terms of it being their favorite or least favorite class. Also, a significant number of Engineering students had a music class as their favorite class much more than having a music class as their least favorite class. On the other hand, an equally significant number of Engineering students had a Literature/Writing class as their least favorite class much more than having a Literature/Writing class as their favorite class. The majority of the Business, Humanities, or Social Science majors took Literature/Writing classes and it is even in terms of being their favorite or least favorite class. The students of this major area also seem to prefer Art/Art History over Philosophy and Religion.

Figure 9 shows the results of the question asking various aspects about students' inquiry seminar or practicum.
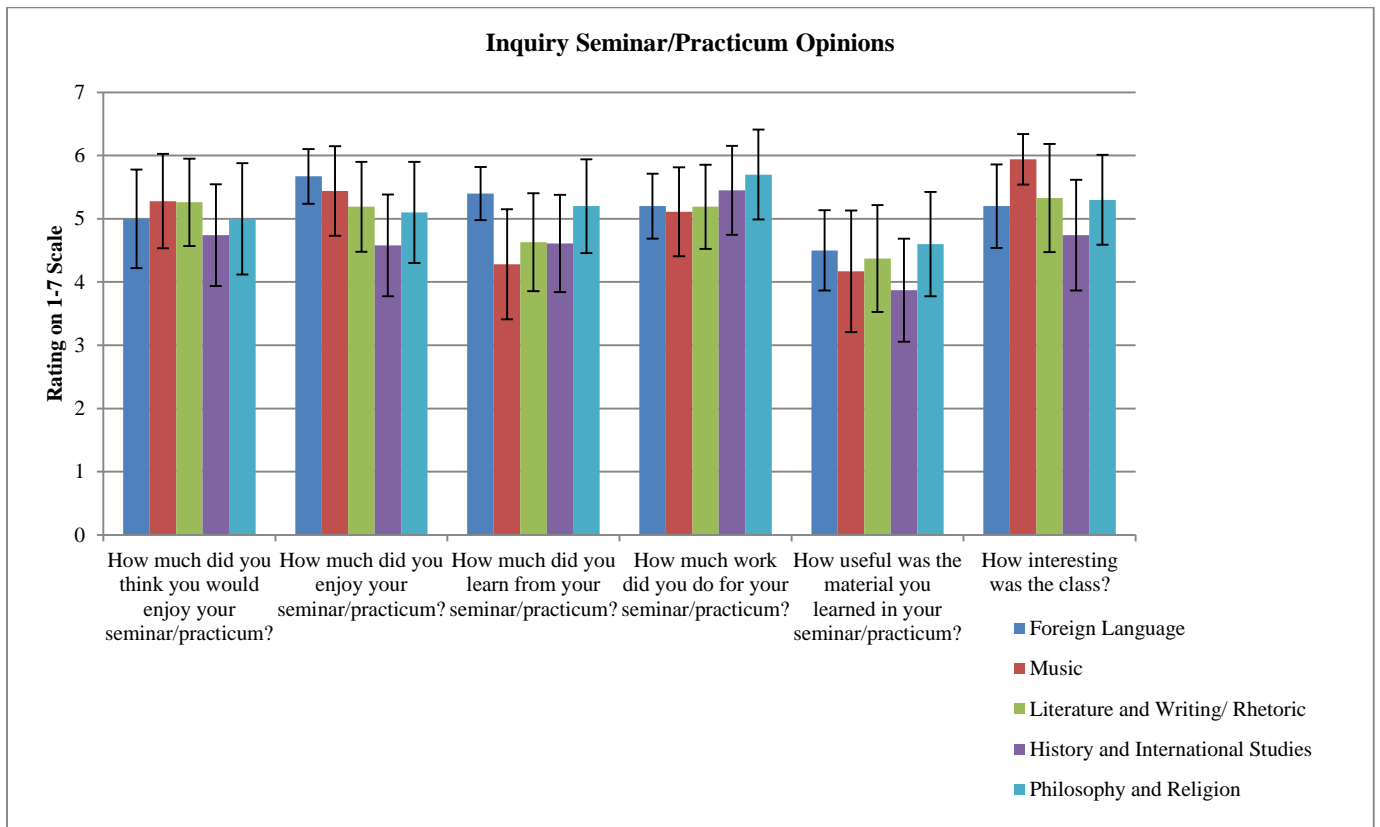
Figure 9: Opinions on Inquiry Seminar/Practicum. The error bars are based off of the standard deviations.

Figure 9 shows that students taking a foreign language seminar enjoyed it much more than they thought they would. They also were the students that thought they learned the most. Students taking a music seminar enjoyed it a little more than they thought they would. They also believed that they had the most interesting seminar. Students taking a Literature/Writing seminar

enjoyed it as much as they thought they would. Students taking a History seminar enjoyed it a little less than they thought they would. Students taking a Philosophy and Religion seminar enjoyed it as much as they thought they would. They also thought they did the most work and had the most useful/applicable seminar.

Figures 10 and 11 show the responses to the questions "Do you think the required number of Social Science classes is: [Too Many, Too Low, Just about right]" and "Do you think the required number of Humanities and Arts classes is: [Too Many, Too Low, Just about right]" respectively.
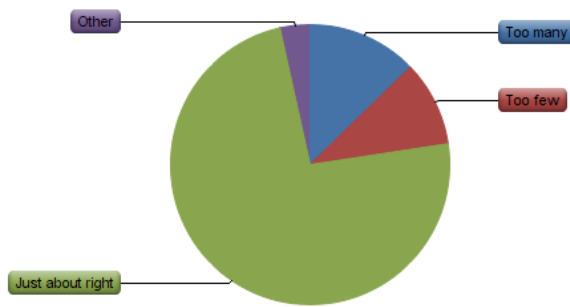
#	Answer		Response	%
1	Too many		44	12.75%
2	Too few		34	9.86%
3	Just about right		255	73.91%
4	Other		12	3.48%
	Total		345	100.00%

Figure 10: "Do you think the required number of Social Science classes is:"
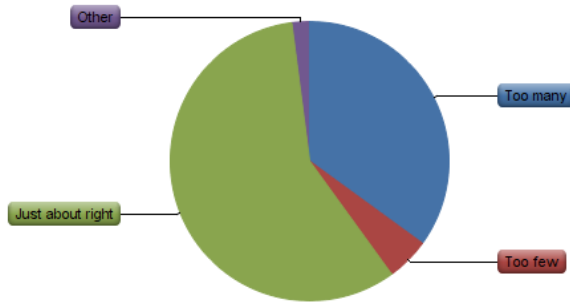
#	Answer		Response	%
1	Too many		119	35.00%
2	Too few		17	5.00%
3	Just about right		197	57.94%
4	Other		7	2.06%
	Total		340	100.00%

Figure 11: "Do you think the required number of Humanities and Arts classes is:"

Figures 10 and 11 show that 3/4s of students think the Social Science requirement is at a good number of classes while slightly more than half of students say the same for Humanities and Arts. Twice as many people think that the Humanities and Arts program requires more classes than it should as compared to the Social Sciences program.

Table 2: Data for: "Did WPI's Humanities & Arts or Social Sciences programs influence your decision to attend WPI? 1 being no influence and 7 being influenced very strongly"

#	Question	1	2	3	4	5	6	7	Total Responses	Mean
1	Humanities & Arts	172	33	31	27	40	23	19	345	2.64
2	Social Sciences	218	33	31	29	24	7	2	344	1.94

Statistic	Humanities & Arts	Social Sciences
Mean	2.64	1.94
Variance	3.99	2.16
Standard Deviation	2	1.47
Total Responses	345	344

According from the data from Table 2, most students were not influenced by the programs; but there were still a handful of students who were influenced to some degree.

Open-ended Questions

Students that took more than the required number of social science classes were asked why they did so. Almost all of them stated that it was because of a major or minor, but a very small portion did either for fun or by accident.

The last question on the survey was asking for any feedback from the respondents. This question, as it was open ended, got a variety of questions that can be summarized into a handful of categories. These categories could be labeled as the following:

1. A response of "no comment", "N/A", or some form of joke or unhelpful response, aka "hi Jeff".

2. A response that advises some change to the survey (which unfortunately was unusable since the responses gathered from the final pool or respondents were gathered after the final draft of the survey was made), for example "I think u should make a selection for the students who don't complete the IQP or MQP yet" (this particular suggestion was even further unusable since the student had misread the survey as there were in fact selections for the students who had not completed IQP or MQP).

3. A response that generally agrees that both the Humanities and Arts and Social Science requirements are good and should not be changed, for example "I enjoyed the fact that the social science and humanities requirements exist".

4. A response that generally argues that both the Humanities and Arts and Social Science requirements should be changed in some way, for example "WPI needs more options for social

sciences built into the curriculum. And taking more business classes and fewer humanities classes would have been much more helpful for finding a job".

5. A response that generally argues that the Humanities and Arts requirement should be changed in some way, for example "I probably would have taken the classes in my depth regardless of the requirement because I was interested in the subject, but I would probably never have proven to myself to be a pretty good artist without the breadth requirement. I think it might even be more interesting to students to have less depth requirements and more breadth requirements so students can get more exposure to various humanities/arts".

6. A response that generally argues that the Social Science requirement should be changed in some way, for example ""Besides ID2050, there's very little point to the social sciences. Either make us take more, or have better, more relevant class options".

7. A response that reflects some personal opinion or experience about the requirements but does not necessarily advocate for whether or not they should be changed, for example "Nobody really knows what's going on when it comes to requirements or what classes will work for them".

CONCLUSIONS

Responses to Questions of Interest

The following is a list of the answers for the Questions of Interest from earlier on in the report (see pages 50 & 51).

1. a.)   There is not a significant number of students who do not understand the humanities and arts requirements. This can be seen clearly through the graph in Figure 1. Also, the data represented in Figure 2 gives a slightly more in-depth look into this area, showing that with each year at WPI, a greater percentage of the students within that class understand the requirements. This conclusion seems very logical given that with each passing year spent at the establishment any given student should be more likely to have had to look into the HUA and SS requirements to insure they are on track to graduate. Super seniors and graduate students are an exception but their sample size was too low for this to be significant.

2. a.)   Due to the lack of proper questioning, this is not a question which can be properly answered using the data from the survey. However, data on students taking certain courses due to their interest in the subject matter from Figures 3, 4, 5, and 6 could potentially be compared to data from the student course evaluation forms to come to a conclusion for this question (See Future Projects section).

3. a.)   Figures 3, 4, 5, and 6 show that across all subjects, students mostly take classes because

they are interested in the subject matter. There are some exceptions, such as Economics in which

more students took it because it fit into their schedule rather than them being interested in it.

4. a and b.)   In both cases, there was no significant amount of data collected from the graphs in

Figures 3, 4, 5, and 6 which showed that students took HUA or SS classes with the specific

intent of helping with a future project, job, or anything else, except of course for ID 2050 which

had almost all of the students who took it say they took it to prepare them for IQP. A similar

occurrence, although not as drastically significant, said the same for GPS, which is also to be

expected. However, the one other noteworthy mention is that roughly 15% of the students who

took drama and theater for HUA said that they took is for this very reason. Due to the wording of

the question at hand, it is a possibility given that since it is drama and theater, the students were

taking them in order to prepare for shows which they intended on performing in/ being involved

with.

5. a.)   The only differences which truly occur between the two disciples are in areas which are

specifically unique to each area (ex. Drama and theater for HUA and ID2050 for SS)

5. b.)   The reoccurring suggestions for the HUA department are to have fewer required classes.

However, due to accreditation issues, this is not a plausible request to even begin to consider. As

for the SS requirements, the main request from students was that there be more options for

classes. The data to the open response questions in the survey which deal with these topics can

be found in the excel file attached to the report (See Appendix H)

RECOMMENDATIONS

While the project obtained the responses necessary for statistically significant data collection and analysis, there are areas in which certain improvements could have been made to increase the quality of the data collected. The most obvious flaw with the survey which was a worry of the team from the start of the project, and was later confirmed in a multitude of the open response questions in the survey, was that it was far too long. Limiting the survey to between 10 and 15 questions would have aided in keeping participants attention while taking the survey. This would have ultimately led to a higher quality of data collection, as well as helped to increase the number of fully completed responses.

Lowering the number of questions in the survey could have been achieved by decreasing the scope of project. By crafting questions to more specifically answer the given problem statement, a higher quality of data could have potentially been collected. Another means of lowering the scope of the project could have been accomplished by possibly switching the focus of the project from both the HUA and SS departments to only one of these departments.

Even though the desired response rate and roughly the correct sample demographic were acquired, there is another method by which both could have been improved. Had the questions in the survey been simplified and not required the skip logic which was utilized, paper copies of the survey would have been possible to distribute. Using physical copies of the survey would have allowed for more people to be directly contacted about the survey, and would have potentially helped even out the sample demographic.

There are a number of conclusions from this project that can suggest that some changes may be advisable to either the Humanities and Arts or Social Science requirements, or both. For

example, one main conclusion of this project is that the social science requirement is misunderstood by a significant proportion of students at WPI. This means that one change that could be beneficial to students is to make sure that any explanation about the social science requirement is as clear as possible. A few possible solutions include creating a new page in the undergraduate catalog that better explains what exactly the requirement is, and which classes would fulfill this requirement. Another solution is to have every social science class include in their syllabus or on the first day of class some brief explanation of how that class fulfills the requirement.

Another main conclusion is that the reasons students took a class varied greatly from class to class. For example, for economics, the two main reasons were either because it fit into their schedule, or because it applied to their major or minor in some way. However for other classes, like philosophy and religion classes, the main reason students said they chose those classes (besides the credit requirement) was because they were interested in the subject. For this reason, it may be to the teacher's benefit to do a quick poll by show of hands of why the students are taking their class. This may allow them to better direct their class, for example if the majority of students say they are interested in the subject matter, then perhaps the professor could try to focus on specifics and go in depth into some subjects, where as if the majority of students say they need it for credit and it fit into their schedule, then perhaps the professor could stick more to the basic curriculum.

A last recommendation is that professors look at the results of this study pertaining to their department or even the specific discipline of courses they teach. By looking at these results, the professors might have a better idea of why students are taking their classes, and they could confirm the results on the first day of classes (through a poll or similar method). This would

allow them to better tailor their classes to the students' interests and would make their classes

more

FUTURE PROJECTS

Moving forward from this project, there is potential to use the data collected in relation to work commitment and enjoyment of student's HUA and SS classes in comparison to that of the course evaluations which are completed at the end of each class. A future project could involve compiling student course evaluations by department and then compare the data on work commitment and enjoyment to that collected in this IQP. This project could look into making correlations between the two sets of data and determine what, if any, relationships between the following three areas exist:

- How difficult students find said classes to be.

- How much students enjoy said classes.

- How much time students put into said classes.

Also, using data from courses from other majors, the following question could potentially yield some interesting insight into the work commitment of undergraduate students towards the HUA and SS requirements.

- Did students do more or less work for their humanities and arts classes and/or social science classes in comparison to all other classes?

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HUMANITIES AND ARTS REQUIREMENT   29

OVERVIEW

The Humanities and Arts Requirement empowers students to meet the broad educational goals of WPI. The balance between technological and humanistic education and the emphasis on inquiry-based approaches to student learning have been and remain hallmarks of a WPI education. In concert with WPI's other degree requirements, the Humanities and Arts Requirement embodies the institute's definition of an educated person. The Humanities and Arts Requirement engages students with theory and practice – *Lehr und Kunst* – through the following educational goals.

GOALS OF THE HUMANITIES AND ARTS REQUIREMENT

- to introduce students to the breadth, diversity, and creativity of human experience as expressed in the humanities and arts;
- to develop students' ability to think critically and independently about the world;
- to enhance students' ability to communicate effectively with others in a spirit of openness and cooperation;
- to enrich students' understanding of themselves;
- to deepen students' ability to apply concepts and skills in a focused thematic area through sustained critical inquiry;
- to encourage students to reflect on their responsibilities to others in local, national and global communities;
- to kindle in students a life-long interest in the humanities and arts.

MEETING THE REQUIREMENT

Students fulfill the humanities and arts degree requirement by completing two units of work consisting of five student-selected courses followed by a 1/3 unit Inquiry Seminar or Practicum (HU 3900, HU 3910, or equivalent). In selecting the courses, students must complete depth and breadth components of the requirement, as described below. At the end of the Inquiry Seminar or Practicum, every student will submit a completion-of-degree requirement form (CDR) to certify completion of the requirement.

DEPTH COMPONENT:

The WPI Plan calls for students to develop a meaningful grasp of a thematic area of the humanities and arts. *To ensure this depth, students complete at least three courses of thematically-related work prior to a culminating Inquiry Seminar or Practicum in the same thematic area.* Thematically-related work can be achieved in two ways:

1. Focusing on one of the following disciplines or disciplinary areas:
   - art/art history (AR)
   - music (MU)
   - drama/theatre (EN/TH)
   - literature and writing/rhetoric (EN, WR, RH)
   - history and international studies (HI, HU)
   - philosophy and religion (PY, RE)

Paths for foreign language study are described below.

2. Defining the thematic area across disciplines or disciplinary areas in consultation with a Humanities & Arts faculty member.

To ensure that students develop a program of increasing complexity, at least one of the three thematically-related courses that precede the Inquiry Seminar or Practicum must be at the 2000-level or above. Students are strongly encouraged but not required to include a 3000-level course within their depth component. The structure of the requirement remains flexible so that students will become intentional learners as they select a sequence of thematically-related courses.

BREADTH COMPONENT:

To ensure intellectual breadth, before taking the final Inquiry Seminar or Practicum, students must take at least one course outside the grouping in which they complete their depth component. To identify breadth, courses are grouped in the following manner:

- art/art history, drama/theatre, and music (AR, EN/TH, MU);
- foreign languages (SP, GN, AB, CN);
- literature and writing/rhetoric (EN, WR, RH);
- history and international studies (HI, HU);
- philosophy and religion (PY, RE).

WPI offers a flexible curriculum to entrust students with a significant amount of choice and responsibility for planning their own course of study. At the same time, WPI requires students to take at least one course outside the depth area in order to provide exposure to more than one disciplinary approach within the arts and humanities, which include the creativity of the fine and performing arts, modes of communication in languages and literature, and the cultural analysis of the past and present. Students are encouraged to experiment and to take courses in more than one group outside the depth area if they wish. By providing exposure to multiple areas, the breadth component encourages students to appreciate the fundamental unity of knowledge and the interconnections between and among diverse disciplinary fields.

The one exception to this breadth requirement is that students may take all six courses in a foreign language.

DEPTH AND BREADTH COMPONENTS IN FOREIGN LANGUAGES:

Development of proficiency in a foreign language necessitates sustained engagement in the language beyond the elementary and intermediate level. Foreign language instruction is broadly interdisciplinary and includes elements of the history, literature, and culture of a particular language area. A student in foreign languages must still meet the depth component of the requirement by taking 6 courses in the foreign language, one of which is approved as the final Inquiry Practicum or Seminar. Additional information about options for the Inquiry Practicum or Seminar in German (GN) and Spanish (SP) can be found later in this section. A student who begins foreign language study is not compelled to remain in that subject, but could choose to switch to another subject of study and complete the depth component in another thematic area.

INQUIRY SEMINAR OR PRACTICUM

The culmination of the depth component of the Humanities and Arts Requirement is an inquiry seminar or practicum. The educational goals for the seminar or practicum are the same regardless of the format.

OBJECTIVES OF THE INQUIRY SEMINAR OR PRACTICUM:

- *Critical inquiry:* to develop each student's ability to apply concepts and skills learned in the humanities and arts, the seminar/practicum offers opportunities to engage in sustained critical inquiry, analysis, or problem-solving in a focused thematic area.

- *Research and investigation:* to engage students in research, discovery, creativity, or investigation, the seminar/practicum provides opportunities for students actively and critically to seek and evaluate new information and insights using multiple sources. These opportunities need not necessarily be research papers.

- *Communication and writing:* to develop each student's ability to communicate effectively both orally and in writing, the seminar/practicum includes discussion of appropriate communications skills and provides opportunities to revise written work after receiving feedback from the instructor.

- *Intellectual independence:* to foster independence of thought, the seminar/practicum offers significant opportunities for individual, self-directed work.

- *Conversation and dialogue:* to promote individual reflection and the appreciation of diverse perspectives, the seminar/practicum consists of classroom activities other than traditional lecture to encourage discussion and collaborative learning in a spirit of openness, cooperation, and dialogue with peers. The thematic focus, structure, and assignments for each seminar or practicum are to be determined by each individual instructor to achieve these goals.

INQUIRY SEMINAR

The Inquiry Seminar, usually taken in the sophomore year, represents the culmination of the Humanities and Arts Requirement. The Seminar provides an opportunity for students to explore a particular topic or theme in the humanities in greater depth. The Seminar has two primary goals. The first is to foster independence of student thought, typically through some form of self-directed activity. The second is to encourage a cooperative, dialogic approach to inquiry, through open exchanges with peers in a small, intensive classroom setting (typically 12 students or fewer). Students learn how to frame questions in the context of a particular discipline or field of study, and to explore or investigate problems using methods appropriate to work in the humanities and arts.

As the student's capstone experience in the humanities and arts, the Inquiry Seminar is intended to help students take their knowledge of the humanities to a higher level. The purpose of the Inquiry Seminar, therefore, is not to provide a broad survey or general introduction to a given discipline, but to provide a structured forum in which students might approach a specific humanities-related problem or theme at a deeper, more sus-

tained level of intellectual engagement than would normally be possible within a traditional course setting. The pedagogical idea behind the Inquiry Seminar is that work in the humanities and arts is at once an intensely personal enterprise, in which the individual freely draws on her or his own particular interests, abilities, passions, and commitments, and at the same time a form of ethical community in which the practitioner is always in conversation with and accountable to others.

While the specific content and requirements of the Inquiry Seminar vary from instructor to instructor, all Inquiry Seminars incorporate self-directed learning as a significant part of the curriculum. It is the department's expectation, therefore, that by the time they enroll in the Seminar, students should have sufficient background in the humanities and arts to be able to work independently and to pose questions of their own. Students will be asked to research and write a term paper, to assemble a portfolio of writings or exercises, or otherwise to demonstrate their ability to pose a question of relevance to humanities inquiry, and to answer it. At the same time, the Seminars are designed to foster an atmosphere of intellectual collaboration and discovery. Students are required to participate fully in seminar discussion, to share the results of their own research or activities, and to engage the ideas and interests of their peers in a constructive and collegial way.

INQUIRY PRACTICUM

Students in the performing arts have the option to complete their Humanities and Arts sequence with an Inquiry Practicum in music or drama/theatre. A practicum shares the same goals and objectives of an inquiry seminar but provides students with a production/performance experience which emphasizes the hands-on, practical application of skills and knowledge gained from previous Humanities and Arts courses. Samples of practicums in music include composing, arranging, or performing a solo recital. Drama/Theatre students may choose to act, direct, or design for a campus production. In addition to weekly meetings, students may be required to attend rehearsals and performances. The design of the final project is determined through conversations between instructors and students. Due to the unique nature of the practicum, permission of the instructor is required to enroll in a practicum.

FOREIGN LANGUAGES: PRACTICUM OR SEMINAR

Students in foreign languages may complete the Humanities and Arts Requirement in one of the following three ways:

1. *Practicum in the sixth and final course in a foreign language.* The practicum will include evaluative components or exams to demonstrate overall language skills in four areas: listening, speaking, reading, and writing. The practicum will require students to demonstrate breadth of cultural knowledge of the language area. (Examples of practicum courses: GN 3512, GN 3515: SP 3522: SP 3527)

2. *Advanced language seminar after five previous courses in the foreign language.* The seminar will explore a thematic topic and provide opportunities for individual inquiry. (Seminar examples: GN 3513, GN 3514: SP 3523, SP 3524, SP 3525, SP 3526, SP 3528, SP 3529, SP 3530, SP 3531)

3. *Advanced language seminar after advanced-level language courses combined with courses from other areas of study.* Students who demonstrate basic oral, written, and cultural knowledge of a foreign language in a placement test at the advanced level may combine courses from other areas for their requirement. (Seminar examples are the same as option 2.)

Option 1 and 2 require students to take six courses in a foreign language. For example, in option 1, a student without prior language training might begin with GN 1511 Elementary German I and conclude with a practicum in GN 3512 Advanced German II. In option 2, for example, a student might start with SP 2521 Intermediate Spanish I followed by five Spanish courses which culminate in one of the designated seminars. In option 3, students who demonstrate knowledge of the foreign language at the advanced level may mix courses from other areas in their course sequence. For example, a student might take two courses from history, philosophy, music, etc. along with four advanced Spanish courses which would culminate in a designated seminar. Students in all three options for foreign languages would be required to submit the same materials to demonstrate completion of the requirement as students whose culminating experience was an inquiry seminar or practicum in another area of the Humanities and Arts.

HUA FACULTY ARRANGED BY CLUSTER

Art/Art History, Drama/Theatre, and Music (AR, MU, TH)
Fred Bianchi (MU)
John Delorey (MU)
Richard Falco (MU)
Joseph Farbrook (AR)
Joshua Rosenstock (AR)
David Samson (AR)
Eunmi Shim (MU)
Erika Stone (TH)
Susan Vick (TH)
Douglas Weeks (MU)

Languages, Literature, and Writing/Rhetoric
(EN, WR, RH, SP, GN)
Kristin Boudreau (EN)
Joel Brattin (EN)
Ulrike Brisson (GN)
Jim Cocola (EN, WR)
James Dempsey (EN, WR)
Jennifer deWinter (WR, RH)
David Dollenmayer (GN)
Michelle Ephraim (EN)
Brenton Faber (WR, RH)
Lorraine Higgins (WR, RH)
Kent Ljungquist (EN)
Aarti Madan Smith (SP)
Ingrid Matos-Nin (SP)
Wesley Mott (EN)
Svetlana Nikitina (HU, EN)
Ángel Rivera (SP)
Lance Schachterle (EN, WR)
Ruth Smith (WR)
Ryan Madan Smith (WR)

History, philosophy, and religion (HI, HU, PY, RE)
Bland Addison (HI)
William Baller (HI)
Steven Bullock (HI)
Constance Clark (HI)
Bethel Eddy (PY, RE)
Roger Gottlieb (PY)
James Hanlan (HI)
Peter Hansen (HI)
Thomas Robertson (HI)
Jennifer Rudolph (HI)
John Sanbonmatsu (PY)
Ruth Smith (PY, RE)
David Spanagel (HI)

AP CREDIT POLICY
The Humanities and Arts Department will accept a maximum of 1/3 unit of AP credit towards the Humanities and Arts requirement. Students who score a 4 or 5 on the AP test in German or Spanish automatically receive 1/3 unit of credit in the language, provided they do not begin German or Spanish study at WPI with Elementary German I (GN 1511) or Elementary Spanish II (SP 1523). Students who score a 4 or 5 on the AP test in studio art may be eligible for HUA credit, subject to a portfolio review by art faculty. Students who score a 4 or 5 on the AP test in other subject areas of the humanities and arts will receive credit in the relevant discipline. AP credit beyond one course (1/3 unit) in the Humanities and Arts may be counted toward other requirements such as free elective credit or particular majors and minors at WPI.

TRANSFER STUDENTS AND THE HUMANITIES AND ARTS REQUIREMENT
Students who transfer fewer than six Humanities and Arts courses from another institution must complete an inquiry seminar or practicum to complete the Humanities and Arts Requirement. Students who transfer six or more courses in Humanities and Arts will have the option of submitting a CDR form or engaging in additional work (or documentation of work) to earn an "A" on the CDR, in accordance with current transfer rules (see below).

All students may have the option of completing their Humanities and Arts Requirement while enrolled for 1 unit of coursework at an off-campus project center where one-third unit of the coursework shall include an inquiry seminar or practicum.

Transfer credit in the Humanities and Arts at WPI is granted on a course-for-course basis. All Transfer students entering WPI with *fewer than six courses or their equivalent of transfer credit in the Humanities and Arts* must complete work in the Humanities and Arts, including an Inquiry Seminar/Practicum to the extent that the overall Humanities and Arts credit totals two units.

No credit toward the Humanities and Arts Requirement is given for introductory-level foreign-language courses unless the entire program is in that foreign language. Usually only one transfer course in Freshman English can be applied toward the requirement. In all cases, the professor for the Inquiry Seminar/Practicum has the final decision on what courses are acceptable within the student's sequence leading up to the project. Up to one unit (i.e. three courses) of transferred work in the Humani-

ties and Arts that is not credited toward the Humanities and Arts Requirement can be credited toward the fifteen-unit graduation requirement; such courses shall receive credit under the category of EL 1000.

If a Transfer student *has completed two units of acceptable college-level work in the Humanities and Arts prior to entering WPI*, a Completion of Degree Requirement form will be submitted by the Humanities and Arts Department Coordinator for Transfer Students at the request of the student. The grade for such a Humanities and Arts Requirement met by transfer credit is normally a grade of "CR". Students whose grades on transferred courses average A can engage in additional work or submit samples of their previous work and may be awarded an A for the Humanities and Arts Requirement. Alternately a transfer student may elect to undertake an Inquiry Seminar/ Practicum in an effort to achieve an A grade. These evaluation options must be exercised prior to the Department's submission of the Completion of Degree Requirement form to the Registrar.

Decisions concerning credit toward the Humanities and Arts Requirement are made by the Humanities and Arts Coordinator for Transfer Students, Professor James Hanlan. He can be contacted in room 28 of Salisbury Laboratories, or at extension 5438, or email jphanlan@wpi.edu.

GUIDELINES FOR GRANTING TRANSFER CREDIT TO U.S. STUDENTS FOR FOREIGN LANGUAGE STUDY

A. Credit for study on the high school level:

1. Transfer credit of 1/3 unit is given for Advanced Placement with a score of 4 or 5.

2. Students with three or more years of foreign-language study in high school, but who have not taken the Advanced Placement examination in that language, may receive 1/3 unit credit for their high school language study upon satisfactory completion of two courses in the same language on the intermediate level or above. (Note: Courses in German and Spanish in addition to those offered at WPI, as well as courses in other languages, are available at other colleges in the Consortium.)

3. In either case 1. or 2. above, in order to receive 1/3 unit credit, students must begin their WPI course sequence at the Elementary II level or above.

B. Credit for study at other colleges and universities:

1. Language study which is done at other universities and colleges prior to entering WPI, or done with the prior written permission of the student's Humanities and Arts Consultant (not the Department Head) as part of an agreed-upon Humanities and Arts sequence, transfers on a course-for-course basis.

2. Language study which is done at foreign universities, language institutes, cultural institutes, etc., prior to entering WPI, or done with the prior written permission of the student's Humanities and Arts Consultant (not the Department Head) as part of an agreed-upon Humanities and Arts sequence, is assessed by the Foreign Languages Consultant on the basis of matriculation papers and the level of work accomplished.

OTHER OPTIONS

INTERDISCIPLINARY STUDY AT THE AMERICAN ANTIQUARIAN SOCIETY

A unique opportunity for interdisciplinary work in the humanities and arts is offered by the American Studies Seminar sponsored each fall by the American Antiquarian Society. Organized in collaboration with Worcester's five undergraduate colleges and universities, this seminar focuses on topics that allow students to investigate the Society's rich holdings in early American history, literature, and culture. The Society's unparalleled collection of documents is a short walk from the campus. Information on application deadlines and academic credit toward the Humanities and Arts Requirement is available from the WPI Campus Representative to the American Antiquarian Society.

OFF-CAMPUS HUMANITIES AND ARTS OPTION

WPI offers the option to complete the Humanities and Arts Requirement during one term of study at several Project Centers. Normally, students complete the requirement through at least six courses or independent-study projects on campus. However, the "Off-Campus" option allows students to combine at least three courses on campus with one term studying the humanities and arts at a Project Center. Since this one-term project is equivalent to three courses, students may use it to complete the requirement.

Off-campus projects are available in Germany for the study of foreign languages and in London and Morocco for other fields. These off-campus programs have a flexible format. Students devote themselves to one term studying the history, literature, language or culture at the project site with a WPI faculty advisor. The program might combine a thematic seminar in an area of the faculty advisor's expertise with visits to museums, the theatre, musical performances, or cultural excursions.

Although themes or areas of emphasis vary from year to year, all off-campus Humanities and Arts activities culminate in a written report in an area of interest to the student.

To be eligible for this one-unit activity, students must have already completed three courses in humanities and arts before they leave campus. Students may apply to the off-campus program before they have taken all three courses. However, students may not participate in the program unless they successfully complete one unit of work in humanities and arts before the term of the project. In addition, students going to any Project Center must complete all of the forms required by the Interdisciplinary and Global Studies Division. Requirements:

- Students must have completed at least three courses in the Humanities and Arts at WPI, or have earned equivalent course credit approved by the Humanities and Arts Department, before the term of the off-campus activity. The Department may allow students to count transfer or advanced placement credits toward the three course minimum;

- Students must be accepted into the off-campus Humanities and Arts program by the Humanities and Arts Department, and complete all forms required by the Interdisciplinary and Global Studies Division, in order to register for these projects.

- Students might be required by the faculty advisor to complete a PQP or attend required meetings before the off-campus project;

- Students must submit a written report or paper at the end of the project. Students also may be required to submit written updates at various times in the course of the project. In all cases, the faculty advisor at the project site will determine the precise form of the written requirements.

- Students may be required to give an oral presentation at the end of the project;

- Under normal circumstances, students must complete the project within one term in order to receive the full unit of credit;

- Only members of the Humanities and Arts faculty at WPI may advise off-campus Humanities and Arts projects.

OFF-CAMPUS RECOMMENDATIONS

All off-campus programs benefit from advance planning. Discuss the possibility of an off-campus activity with your academic advisor at the beginning of the freshman year. Consult with the WPI faculty who will advise these off-campus projects as early as possible, since they may be able to suggest useful courses or other background resources for the projects. Also keep in mind that three courses are the minimum required, but many students find it advantageous to take additional courses before going away.

The interdisciplinary London and Morocco programs are open to students with a background in areas of the humanities and arts besides foreign languages, including art history and architecture, drama/theatre, history, literature, music, philosophy, religion, or writing/rhetoric. After taking at least three courses in any of these areas on campus, you could then go to London to complete your project. Some students also have gone to London with this program to study beyond the Humanities and Arts Requirement for international studies, history, literature, music, theatre, or other areas.

WPI offers programs in the German language at Darmstadt. This program requires completion of foreign language courses through the level of intermediate II or above (2000-level or above) before going abroad. For students who have taken foreign language courses in high school, language placement exams are available during New Student Orientation. Some students with basic foreign language preparation have completed their arts projects in Germany. We welcome a creative approach to off-campus study.

More advanced students may participate in these off-campus programs by doing work toward a minor or major. A student who had already completed their Humanities and Arts Requirement on campus, for example, might be able to work in the humanities and arts on an Independent Study Project that could count toward a minor. Or a student at one of these sites could work on a Major Qualifying Project in fields such as Humanities and Arts, International Studies, or Professional Writing.

The Humanities and Arts Department advertises upcoming project locations and application deadlines at the Global Opportunities Fair each September. Future project opportunities might include other foreign locations or projects that provide the context for an intensive study of humanistic themes associated with particular locales within the United States. Contact the Department of Humanities and Arts for more information.

THE SOCIAL SCIENCE REQUIREMENT

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Social science deals with the behavior of individuals and groups as well as the functioning of the economic and political systems and institutions that shape and control our lives. As such, it offers a perspective that is essential for anyone desiring a well-rounded education.

Therefore, WPI, in common with other colleges, requires some exposure to the social sciences for its graduates. In satisfying the two-course social science requirement, students are free to take courses in any of the traditional social sciences: economics, political science, sociology, and psychology. Courses with the following prefixes may be counted toward the social science requirement: ECON, ENV, GOV, PSY, SD, SOC, SS, STS. The social science courses offered at WPI are grouped into two broad categories. The first consists of core courses that introduce students to the social sciences and help them understand the scope and limits of social science approaches and how they might be related to the design of Interactive Qualifying

Projects. The second, more advanced, set of courses looks in depth at particular issues and problems, providing students with a more detailed understanding of social science disciplines and their use in social problem solving and interactive projects.

To obtain maximum benefit from their study of social science, students should choose courses that will provide knowledge and skills relevant to their Interactive Qualifying Project. These courses should be taken prior to or concurrent with undertaking the IQP and should be selected, if possible, after the student has identified the general topic area in which his or her interactive project work will be carried out.

More information on the alternatives available and the factors that should be considered in choosing courses to satisfy the social science requirement are available on the Social Science and Policy Studies department website at www.wpi.edu/Academics/Depts/SSPS.

APPENDIX B: Survey

Social Sciences

Do you believe you are aware of the requirements of the social sciences program at WPI?

○ Yes

○ No

Please use this WPI resource to better understand the requirements.

http://www.wpi.edu/academics/ssps/ugrad-courses.html

○ I think I am now more aware of the social science requirement. (Click this when you think you understand.)

How many social science classes have you taken or are currently enrolled in at WPI? (This includes Psychology, Economics, Environmental Studies, Political Science and Law, Sociology, and System Dynamics. These are any classes have the following abbreviations: ECON, ENV, GOV, PSY, SD, SOC, SS, STS. It also includes ID 2050 and some of the Great Problem Seminars (GPS).)

[▼]

Why did you choose the first social science class that you've taken?

☐ I was interested in the subject matter.

☐ It fit into my schedule.

☐ I heard the class was easy.

☐ I wanted to take a class with that professor.

☐ It would prepare me for a future project.

☐ It applies to my major in some way

☐ Other (please specify).

[_____]

Why did you choose the second social science class that you've taken(Select all that apply)?

☐ I was interested in the subject matter.

☐ It fit into my schedule.

☐ I heard the class was easy.

☐ I wanted to take a class with that professor.

☐ It would prepare me for a future project.

☐ It applies to my major in some way

☐ Other (please specify).

[_____]

Why did you take 3 or more social sciences?

For the first class that you took, rate the following compared to the rest of your classes with 0 being the lowest and 10 being the highest.

	0	1	2	3	4	5	6	7	8	9	10
How much did you think you would enjoy the class?											
How much did you enjoy the class?											
How much did you learn in the class?											
How much work did you do for the class?											
How useful was the material you learned in this class?											
How interesting was the class?											

For the second class that you took, rate the following compared to the rest of your classes with 0 being the lowest and 10 being the highest.

	0	1	2	3	4	5	6	7	8	9	10
How much did you think you would enjoy the class?											
How much did you											

How much did you enjoy the class?										
How much did you learn in the class?										
How much work did you do for the class?										
How useful was the material you learned in this class?										
How interesting was the class?										

Humanities

Do you believe you are aware of the requirements of the Humanities and Arts program at WPI?

○ Yes

○ No

Please use this WPI resource to better understand the requirements.

https://www.wpi.edu/academics/hua/ugrad-requirements.html

○ I think I am now more aware of the humanities requirement. (Click this when you think you understand.)

How many humanities classes have you taken or are currently enrolled in at WPI? (Includes American Studies, Art & Art History, Drama & Theater, English, History, Literature, Modern Languages, Music, Philosophy & Religion, Writing & Rhetoric. These are any classes with the following abbreviations: AB, AR, CN, EN, GN, HI, HU, ISE, MU, PY, RE, SP, WR. It also includes some of the Great Problem Seminars (GPS).)

This does NOT include a seminar or practicum.

[▼]

Have you chosen your intended depth, or already completed your depth? If yes, please specify what it is in.

[▼]

Why did you choose that particular depth?(Select all that apply.)

☐ I was interested in the subject matter.

☐ I heard the classes were easy.

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☐ I wanted a particular professor.

☐ It would apply to a future project

☐ It applies to my major in some way

☐ Other (please specify).

[   ]

For your humanities class, please rate it in the following categories compared to the rest of your classes, with 0 being the lowest and 10 being the highest.

	0	1	2	3	4	5	6	7	8	9	10
How much did you think you would enjoy the class?											
How much did you enjoy the class?											
How much did you learn in the class?											
How much work did you do for the class?											
How useful was the material you learned in this class?											
How interesting was the class?											

For your favorite humanities class, please rate it in the following categories compared to the rest of your classes, with 0 being the lowest and 10 being the highest.

	0	1	2	3	4	5	6	7	8	9	10
How much did you think you would enjoy the class?											
How much did you											

	0	1	2	3	4	5	6	7	8	9	10
How much did you enjoy the class?											
How much did you learn in the class?											
How much work did you do for the class?											
How useful was the material you learned in this class?											
How interesting was the class?											

For your least favorite humanities class, please rate it in the following categories compared to the rest of your classes, with 0 being the lowest and 10 being the highest.

	0	1	2	3	4	5	6	7	8	9	10
How much did you think you would enjoy the class?											
How much did you enjoy the class?											
How much did you learn in the class?											
How much work did you do for the class?											
How useful was the material you learned in this class?											
How interesting was the class?											

Have you taken a seminar or practicum?

○ Yes

○ No

For your seminar or practicum, please rate the following compared to the rest of your classes with 0 being the lowest and 10 being the highest.

	0	1	2	3	4	5	6	7	8	9	10
How much did you think you would enjoy your seminar/practicum?											
How much did you enjoy your seminar/practicum?											
How much did you learn from your seminar/practicum?											
How much work did you do for your seminar/practicum?											
How useful was the material you learned in your seminar/practicum?											
How interesting was the class?											

Future

Besides the credit requirement, why did you take/ do you plan on taking humanities and arts classes?(Select all that apply.)

☐ The subject(s) interest/interested me.

☐ I thought the classes would be easy.

☐ I thought the classes would be hard.

☐ The classes will prep me for the future.

☐ It applies to my major in some way

☐ Other (please specify).

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Besides the credit requirement, why did you take/ do you plan on taking social science classes?(Select all that apply.)

- [ ] The subject(s) interest/interested me.
- [ ] I thought the classes would be easy.
- [ ] I thought the classes would be hard.
- [ ] The classes will prep me for the future.
- [ ] It applies to my major in some way
- [ ] Other (please specify).

Did you find the humanities classes useful for any of the following? (Select all that apply.)

- [ ] IQP
- [ ] I have not taken IQP
- [ ] MQP
- [ ] I have not taken MQP
- [ ] An internship/job
- [ ] I have never had an internship/job
- [ ] Other (please specify)

Did you take or are you planning on taking your humanities classes because you think they might help you with IQP, MQP, an internship/ job, or other?

- [ ] Yes (please specify which)
- [ ] No
- [ ] Maybe (not sure)

Did you find the social science classes useful for any of the following? (Select all that apply.)

- [ ] IQP
- [ ] I have not taken IQP
- [ ] MQP
- [ ] I have not taken MQP
- [ ] An internship/ job
- [ ] I have never had an internship/ job
- [ ] Other (please specify)

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Did you take or are you planning on taking your social science classes because you think they might help you with IQP, MQP, an internship/ job, or other?

○ Yes (please specify which)

[   ]

○ No

○ Maybe (not sure)

Did WPI's Humanities & Arts or Social Sciences programs influence your decision to attend WPI?

○ Humanities & Arts
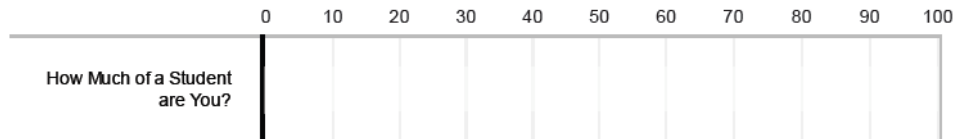
○ Social Sciences

○ Both

○ Neither

Demographics

What is your gender?

○ Male

○ Female

○ Other

What Year student are you?

○ First year

○ Sophomore

○ Junior

○ Senior

○ Super Senior

○ Graduate

Are you a WPI student? Slide to 10 if yes or 0 if no.

	0	10	20	30	40	50	60	70	80	90	100
How Much of a Student are You?											

How many majors do you plan on declaring

○ 1

○ 2

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What is your 1st Major?

[▼]

What is your 2nd Major?

[▼]

Do you plan on minoring in a humanities or social science program?

[▼]

If you would like to be entered into the raffle to win (prize(s)), please follow this link and follow the instructions (this will only take a few seconds).

◯ Link to Survey

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APPENDIX C: IRB Application for Exemption

The following is the link for all of the WPI IRB related forms;

- http://www.wpi.edu/offices/irb/forms.html

APPENDIX D: Email to Undergraduates

Title: Please help us do our IQP! Only a couple minutes, tops!

Dear fellow students,

We are an IQP group conducting a survey in order to get feedback about the social science and the humanities and arts requirements at WPI. We would greatly appreciate it if you would take a few minutes out of your day and complete the survey – your feedback could be used to impact the future of either of these two requirements!

Here is the link to the survey:

https://wpi.qualtrics.com/SE/?SID=SV_9XheZYiLzaxRfet&Preview=Survey&BrandID=wpi

After completing the survey, you may opt in to a raffle where you have a chance to win _____! If you opt in, your personal information will be kept separate from any connection to the data provided (it will be solely for prize distribution purposes).

Thank you!

Regards,

Cody Gonyea

Jeff Signore

Alex Turland

Liz Whittle

APPENDIX E: Changes to SGA Moderated Email Aliases

The following Authorized Use Policy (AUP) for campus wide emails has been refined to help the WPI community better organize and understand how to use the campus wide standing lists. Being at WPI means being part of a strong email culture, which could very easily mean more than twenty emails a day. It is imperative that you keep your email organized.

Organizing Email

It is encouraged that all students make subfolders and inbox forwarding rules in their outlook accounts. This can help you sort your messages based on their importance. These can be created using the exchange website exchange.wpi.edu or by using the outlook application. On the exchange website, click options in the top right corner and then click organize email.

Standing List Descriptions:

Undergraduates: undergraduates@wpi.edu

The undergraduate list is composed of current undergraduate students at WPI. This list is intended for informational emails. Emails that are for specific majors should be sent to the designated major alias. Emails sent to this list are moderated by SGA.

Class Years: freshmen@wpi.edu sophomores@wpi.edu juniors@wpi.edu seniors@wpi.edu

These lists are composed of all undergraduate students in their designated freshmen, sophomore, junior or senior class year. Students attending WPI as an undergraduate for more than four years will remain on the senior list. These lists are intended for informational emails. Emails sent to these lists are moderated by SGA.

Campus Events: campus-events@wpi.edu

The campus events alias is composed of all current undergraduates and graduate students at WPI. SAO Recognized clubs may send out one invitation for the first meeting of the semester and can send out one email per campus wide event. Organizations undergoing the recognition process may with the SAO's approval send an email out to campus events. Emails sent to this list are moderated by either SGA or GSG.

Students: students@wpi.edu

This list is for information that pertains to both undergraduates and graduate students currently enrolled at WPI. Unlike the campus-events alias this is for informational use only. Emails that are for specific majors should be sent to the designated major alias. Emails sent to this list are moderated by SGA and GSG separately.

Graduate Students: graduate-students@wpi.edu

The graduate list is composed of current graduate students at WPI. This list is intended for informational emails. Emails sent to this list are moderated by GSG.

Part Time and Full Time Graduate Students: grads-parttime@wpi.edu grads-fulltime@wpi.edu

These lists are composed of part time and full time graduate students respectively. These lists are intended for informational emails. Emails sent to these lists are moderated by GSG.

Emails with all- prefix i.e. all-students@wpi.edu , all-sophomores@wpi.edu etc.

These emails are for official business only, meaning no social or club based emails. These aliases are generally reserved for campus safety notifications, SNAP hours or delays, parking, important course or registration notifications and other emergency information. These emails may be marked as high importance.

Unsubscribing

Students may unsubscribe from any list that does not have the all- prefix in front of it. You can do this by clicking the link at the bottom of the email or by visiting https://www.wpi.edu/+standinglist .

Moderation

Ultimately it is left up to the discretion of the moderator on what emails are released. If you have any further questions please contact sgapresident@wpi.edu or gsgpresident@wpi.edu . Below are some generally followed rules of thumb.

Rules Regarding All Aliases
- No reminders
- Please have good formatting, plain text emails are discouraged and will most likely be denied. If the body of your email is an image be sure to insert it into the body using outlook on a Windows machine to ensure correct formatting.
- Signatures should not be more than 4 lines and only used if appropriate.
- Never bcc or cc any of the standing lists.
- Do not reply all to a campus wide email.
- Do not have a lengthy subject or one in all capital letters.
- If your email does not pertain to more than 300 people it should not be a campus wide email.

- Lost items do not warrant a campus wide email.
- Max message size for all of these aliases is 500000 bytes.
- Newsletters or regular publications will be decided on a case by case basis.
- As of this time project group surveys will not be accepted.

Outline of Standing Lists Structure

List Address	Members	Purpose	Moderated By
undergraduates@wpi.edu	Subscribed Undergraduate Students	Information	SGA
freshmen@wpi.edu	Subscribed First Year Undergraduates	Information	SGA
sophomores@wpi.edu	Subscribed Second Year Undergraduates	Information	SGA
juniors@wpi.edu	Subscribed Third Year Undergraduates	Information	SGA
seniors@wpi.edu	Subscribed Fourth Year + Undergraduates	Information	SGA
graduate-students@wpi.edu	Subscribed Graduate Students	Information	GSG
grads-fulltime@wpi.edu	Subscribed Fulltime Graduate Students	Information	GSG
grads-parttime@wpi.edu	Subscribed Part Time Graduate Students	Information	GSG
students@wpi.edu	Subscribed Students	Information	SGA & GSG Seperately
campus-events@wpi.edu	Subscribed Students	Events	SGA or GSG
all-undergraduates@wpi.edu	All Undergraduate Students	Official Business Only	SGA
all-freshmen@wpi.edu	All First Year Undergraduates	Official Business Only	SGA
all-sophomores@wpi.edu	All Second Year Undergraduates	Official Business Only	SGA
all-juniors@wpi.edu	All Third Year Undergraduates	Official Business Only	SGA
all-seniors@wpi.edu	All Fourth Year + Undergraduates	Official Business Only	SGA
all-graduate-students@wpi.edu	All Graduate Students	Official Business Only	GSG
all-grads-fulltime@wpi.edu	All Fulltime Graduate Students	Official Business Only	GSG
all-grads-parttime@wpi.edu	All Part Time Graduate Students	Official Business Only	GSG
all-students@wpi.edu	All Students	Official Business Only	SGA & GSG Seperately

APPENDIX F: Qualtrics Data Report

Attached to the electronic submission of this report is a Microsoft Excel document containing all the data gathered from the survey.9