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Online Academic-Support Technology Website

Brian Myer Leslie

Worcester Polytechnic Institute

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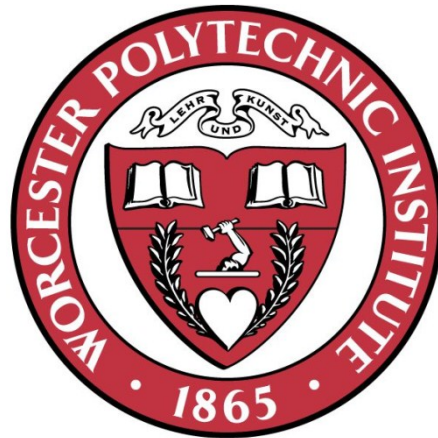
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Online Academic-Support Technology Website (OATSW)

by

Brian Leslie

Presented to Professor Soussan Djamasbi



An Interactive Qualifying Project
Submitted to the Faculty
of
WORCESTER POLYTECHNIC INSTITUTE
In fulfillment of the requirements for a
Degree of Bachelor of Science

Interactive Qualifying Project

Worcester Polytechnic Institute

Worcester, Massachusetts

Thursday December 18th, 2012

1. Abstract

This project is the first step of a larger project which is aimed towards enhancing the ability of students with academic accommodations to succeed by providing an online tutorial for academic support technology. This online library will include tutorials for an array of supportive software that is focused on assisting students in their academic careers. Although intended for students with academic accommodations, the library would be a great student resource in general. The project reports the results of the first milestones that form the foundation of an online support technology library; it also outlines the steps needed to complete the larger project perhaps by means of future IQPs.

2. Acknowledgments

I would like to thank Professor Soussan Djamasbi for providing me with excellent guidance throughout this project. Without her support I would not have been able to follow my passion by perusing this as a project.

I would like to thank Aaron Ferguson the Director of Disability Support and Student Accommodation Services at WPI in the Office of Disability Services for his support and guidance regarding the project's usefulness to the WPI community.

I would also like to thank Cambium Learning Technologies and Kurzweil Educational Systems for their support in allowing me to reference the Kurzweil Software.

I would like to thank Jim Monaco of WPI for helping me with learning the Camtasia software and HTML coding for the website design.

I would like to thank Chris Rubin and the ADAPT club at Assumption College for their help with this project.

I would like to thank MIT, the staff of the MIT Assistive Technology Information Center and the Office of Disabilities for allowing me to tour their lab and for outlining how they meet the needs of students with disabilities on their campus.

3. Authorship Page

This Project was worked on and completed by myself with the help of several individuals in order to complete the report.

Table of Contents

1. Abstract.....	1
2. Acknowledgments.....	2
3. Authorship Page.....	3
4. Executive Summary.....	7
5. Introduction.....	8
6. Personal Experience.....	8
6.1 Motivation for IQP.....	9
6.2 Current Design Approach.....	9
6.3 Project Goals.....	10
6.4 Benefits for WPI Students.....	11
6.5 Community Impact.....	11
7. Background.....	12
8. Methodology.....	14
8.1 Design.....	14
8.2 Assistive Technology and Information (ATC) at MIT.....	15
9. Requirements and Needs.....	17
9.1 Survey Results.....	17
9.1.1 Question One.....	18
9.1.2 Question Two.....	19
9.1.3 Question Three.....	20
9.1.4 Question Four.....	21
9.1.5 Question Five.....	22
9.1.6 Question Six.....	23
9.1.7 Question Seven.....	24
9.1.8 Question Eight.....	24
9.1.9 Question Nine.....	25
9.1.10 Question Ten.....	26
9.1.11 Question Eleven.....	27

9.1.12 Question Twelve.....	28
9.1.13 Question Thirteen.....	29
9.2 Discussion.....	29
10. Recommendations and Conclusion.....	33
10.1 Recommendations.....	33
10.2 Conclusion.....	34
11. Appendix.....	36
11.1 Appendix A – IQP Interview – Draft I.....	36
11.2 Appendix B – IQP Sample Interview.....	37
11.3 Appendix C – IQP Survey – Draft I.....	38
11.4 Appendix D – IQP Survey – Draft II.....	40
11.5 Appendix E – IQP Survey Question Types.....	43
11.6 Appendix E – IQP Vocab Table.....	45
11.7 Appendix F – IQP Outline.....	46
11.8 Appendix G – Assistive Technologies at MIT Handout.....	48
11.9 Appendix H – Kurzweil Software.....	50

Table of Tables

Table 1: IQP Vocab Table	45
Table 2: IQP Outline	46

Table of Figures

Figure 1: Question One Results	18
Figure 2: Question Two Results	19
Figure 3: Question Three Results	20
Figure 4: Question Four Results	21
Figure 5: Question Five Results.....	22
Figure 6: Question Six Results	23
Figure 7: Question Seven Results.....	24
Figure 8: Question Eight Results	25
Figure 9: Question Nine Results	26
Figure 10: Question Ten Results.....	27
Figure 11: Question Eleven Results.....	28
Figure 12: General Population for Learning Styles (Performance Learning Systems, 2010)	30

4. Executive Summary

The proposed Online Academic-Support Technology Website and Library Database focuses on the needs of students at Worcester Polytechnic Institute with academic accommodations. The website aims to inspire and enhance all students learning by providing easy access to helpful support materials online. By focusing on aiding a specific group of students the main goal of the project is achieved along with providing the benefits to the rest of the WPI community.

The project aims to create an environment for students to learn how to use support technology software. Although students might achieve success without using software, this resource will provide an enhanced learning experience for those who might not have the opportunity to learn or use academic support technologies. As of 2006, approximately 5.6% of students in the United States ages 3 to 21 enrolled in public education were diagnosed with a learning disability (Vickers, 2010). The percentage of students with a learning disability has drastically increased from 3.6% determined in 1981 (Vickers, 2010). The increasing number of students who require academic support provides a need for the Online Academic-Support Technology Website and Library Database.

This project will provide the foundation for future development on the concepts discussed within this document. A main goal of the project is to determine what is required in order to design a model Academic Accommodation website database environment for WPI to meet the current and future needs of WPI students with disabilities. This website will pioneer a new type of online tutorial database to create a rich academic support experience to enhance student learning.

5. Introduction

Easy access to essential academic resources is essential to the success of every student at any institution. Currently, the Office of Disability Services at WPI provides a vast amount of resources for helping students with their academic needs. A localized environment with easy to follow instructions for using the available resources offered by the Office of Disability Services at WPI would greatly enhance their ability of this office in helping students.

This project is the first towards enhancing the reach and effectiveness of the provided resources at the Office of Disability Services at WPI by proposing an online tutorial library for the available support technologies. Students with disabilities and other learning challenges face an up-hill battle with a challenging WPI curriculum. Accommodation resources are not always accessible to all students in a way that is consistent with their learning style and strengths. My goal is to try and reach out to students who have accommodations here at WPI and provide resources that can encourage them that success is possible.

6. Personal Experience

From my experience here at WPI there is a massive amount of valuable information and tools that are available to students. However most students do not realize how they could use or access these resources and therefore a system is needed in order to inform students about the possibilities on how to use these resources effectively. For example software that is used in a particular class might be taught by just giving a tutorial document with no pictures. While this may be sufficient for most students in the class, a student that struggles with obtaining information from reading the tutorial will find it difficult to complete the work because of their

different learning style. The proposed website in this project will allow students to access a tutorial for using a specific software tool that fits their learning style. This enhanced lesson available online will give the students with accommodations the resource necessary to be able to succeed and have the same opportunities as their classmates.

6.1 Motivation for IQP

I chose this project because it was something that not only interested me but I have a real connection to the development of this project. I am a student receiving academic accommodations at WPI. Part of my academic success can be attributed to my work ethic and understanding of how I learn. I had to learn “how to learn” by being able to adapt to different situations. I have also taken advantage of the academic accommodations, specifically the Kurzweil software available at WPI. Background on the Kurzweil software can be found in **Appendix H**. My passion is trying to improve WPI’s support system to students with academic accommodations. After experiencing WPI from the viewpoint of a student with an academic disability I am able to propose something that will greatly benefit future students.

6.2 Current Design Approach

Students with disabilities face many challenges. The Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990 mandates that reasonable accommodations be made to students with disabilities so that they can freely and actively participate in all facets of University life. This IQP will outline a model Academic Accommodations Library of tutorials for the Office of Disability Services to assist students with disabilities to meet their academic goals. The mandated accommodations that students receive are important to a student’s success at WPI. However, knowing their own learning style and understanding how resources can fit

with that style is what ultimately allows a student to reach their maximum academic potential with a higher degree of autonomy. There is a real need for more accessible resources for support technologies. This website will assist students by providing them with tutorials on how to use the support technology software. Support technology provides students with access to the necessary tools for them to succeed in completing the tasks presented by their courses. In addition to tutorials for support technologies, the proposed website will also provide a list of commercially available hardware and software resources, some of which will be available on campus. Further, the Website could also be used for training for faculty and staff on how to use the software in the classroom to teach students with accommodations.

6.3 Project Goals

The main objective of this project is to create a resource that focuses on the needs of students with academic accommodations here at WPI. Most assistive technologies are not easy to use and often lack tutorials/guidelines that fit students learning styles of those who need to use it. A main purpose of this project is to help student who have accommodations here at WPI feel more confident that they can be successful under the very demanding challenges presented by the WPI curriculum by showing them some useful techniques for using technologies that can help them achieve their academic goals.

To achieve this objective, this project takes a basic step towards developing a 24/7 accessible University-supported Online “Virtual Lab” website that provides tutorials for using academic support technologies. This website could potentially provide an infrastructure for student support at WPI and could be shared with other universities.

6.4 Benefits for WPI Students

WPI needs to meet the needs of a growing population of students with disabilities and provide the resources for them to succeed in a challenging academic environment. While WPI provides an array of assistive technologies it lacks is a localized 24/7 available environment that has a complete set of user friendly instructions a WPI student would need in order to use an academic support technology and adapt it for his/her specific needs.

6.5 Community Impact

The project has an important impact on our community because it helps students struggling with understanding how to use particular software programs that supports their learning style. It also helps to raise awareness among this population who often do not know about software that can assist them in learning and/or that such software is available to them on campus free of charge. The website would serve as a great tool for professional staff to use with students and faculty in training and raising the awareness of the availability of the software on campus. The website will encourage students to be more involved in their learning. Even if the website helps only a small number of students with accommodations it will make a vast difference in the WPI community. For example, I think I will make a difference if I can teach a student that has never heard of Kurzweil text-to-speech software how to use it in his/her day to day life, it will be a benefit to the student's learning experience here at WPI and in the future. I believe this project can also assist professors in teaching by them to integrate the website into their classroom.

7. Background

This Project was developed to improve the academic support offered to students at Worcester Polytechnic Institute. The original design was to outline a model Academic Accommodations Lab for the Office of Disability Services to assist students with disabilities to meet their academic goals. There is a real need for a facility where students can go that has all the necessary tools for them to succeed just like a typical lab has all the necessary equipment to complete the tasks presented by the lab course. The Accommodations Lab could offer both up-to-date hardware and software resources. The Model Lab could offer accessible work stations, including computer monitors with adjustable arms, large-print keyboards, trackball mice, headphones with microphones and scanners. Assistive devices could include iPads with accessible apps, Smart pens, ZoomText magnifiers, and software programs such as Dragon Naturally Speaking and Kurzweil. This lab will include an online library database of tutorials for support software which is the basis for this project.

While the original design required adequate funding and is beyond the scope of the IQP, it sparked the idea to take the physical lab and make into an online learning environment. This project set out to gather the initial requirements for such an online environment. The requirement gathering process provided data that supports the need for an Online “Virtual Lab”. The analysis of data shows that students would benefit from 24/7 access to tutorials for using assistive software.

To facilitate a better understanding of the vocabulary used in this document for those who are not familiar with assistive technologies a list of terms followed by their specific definition as it pertains to this project are provided in **Appendix E** (Ferguson, 2011).

The target audience for this project is students with academic accommodations at Worcester Polytechnic Institute. The term “accommodation” refers to any modification or adjustment to a work environment that will enable qualified individuals with a disability to perform essential job functions (Partners Resource Network, 2012). In this case an “academic accommodation” refers to a specific type of accommodation that is directed at students in an academic atmosphere to support students in realizing their academic potential.

Accommodations are services or supports used to enable a student to fully access the subject matter and instruction. An accommodation does not alter the content or expectations; instead it is an adjustment to instructional methods. A specific student’s accommodations are specified in a letter from the WPI Office of Disability Services. Examples include books on tape, access to assistive technology, content enhancements, and allowing additional time to take a test (Partners Resource Network, 2012).

Currently for new students there is very limited training for most software used and offered at WPI. Typically, training is offered only for specific types of software and the majority of the kinds of software that are offered are not for students with academic accommodations. For example, there are no official trainings offered for students who wish to learn how to use Kurzweil, a text-to-speech software designed to help people with reading. The integration of Kurzweil into WPI’s learning environment can have a significant positive impact on learning of those students that benefit from using this software. Therefore by giving students the needed resource to learn on their own, the proposed virtual online tutorial library allows Kurzweil to be more integrated in learning at WPI and hence used by both students and staff more easily. The integration of support technology softwares increases the understanding for faculty to see how students utilize the software in their classrooms.

8. Methodology

8.1 Design

The methodology of this project consisted of the design that would be appropriate for the website. At the beginning of the project I was determined to develop a website with Kurzweil implemented into the library database. However, as I started to work on the project I realized that in order to build a successful tutorial library I will need to determine how WPI is currently meeting the needs of students with disabilities and determine how other universities are meeting this challenge. This information would then help me propose a model Academic Accommodation Lab for WPI to meet the current and future needs of WPI students with disabilities.

The information gathering process for completing this project included reviewing the campus accessibility, visiting other universities and interviewing students and staff, conducting needs survey of WPI students with disabilities, and reviewing other assistive technology resources.

The website design component of the original project proposal was only briefly worked on until it was realized that more work had to be done to determine the direction and focus for an online library and database. This part of the project is a component of future recommendations and will be implemented in 2013.

In order to design an effective survey several interviews were conducted with WPI students. An early example of interview questions that were asked to participants is provided in **Appendix A**. An example of a student's responses to the interview is provided in **Appendix B**.

A survey was then constructed using the information gained from the interview process. In order to gather information from a larger population, I went outside the WPI community to other universities with a larger population of students with learning disabilities. There was a relatively large response from the surveys from the other university which was enough to use as a reference. The survey process resulted in confirming the need for the website and that future research is required.

8.2 Assistive Technology and Information (ATC) at MIT

In addition to the main surveys that were attempted on the WPI campus and at the other neighboring university, a visit was also made to Massachusetts Institute of Technology (MIT) Assistive Technology and Information Center (ATIC) in order to see what other schools were doing to meet the need of their students. I arranged a visit to MIT and visited their Assistive Technology and Information Center. The lab has been open for approximately 10 years. The lab provided a vast amount of resources to students who receive accommodations. The lab has eight computer stations which included both MAC and PC options and is staffed from 9AM-5PM, but is open 24 hours to MIT students with access. The lab has two scanners which can be used by the staff to scan books; the staff recommended using the Fujitsu Scansnap S510M scanner because of its ease of use. In order to integrate Kurzweil into the MIT lab, the students and staff have to scan books by chapter and then convert them into Kurzweil file formats. Students who are new to Kurzweil have some difficulty integrating it into their workflow and daily routine. Kurzweil also has a problem reading graphs, tables, and most math applications which reduce the effectiveness of the software.

Most materials and books made available in the ATIC are through the MIT Stellar system where each student has a folder which materials and books can be uploaded to their accounts. Students who do not own their own text-to-speech software must access their material in the lab and currently there is no implementation for students to use the lab for exams. The training that is conducted within the lab is mostly one-on-one and is not available online. A handout of the assistive technologies available for students at MIT can be found in **Appendix G**.

In order to notify students of new materials, resources, and tools they use an email list. One of the new technologies being implemented into the MIT lab that I was fortunate to test was an ECHO smart pen and pad by Livescribe. I was also able to interview an MIT Graduate student who shared his experiences using Kurzweil to scan his books himself then converts them chapter by chapter when he is in the lab. He has used both the MAC and PC version of Kurzweil to take notes but has problems with getting Kurzweil to read graphs and figures and would like to see more imbedded text explanations. I also interviewed with an Academic Advisor from the Office of Disabilities who was very interested in my project. This advisor told me that MIT is looking into providing more access to software online versus in the lab but licensing and money are the main issues. By visiting an established university lab designed for academic accommodation support, I was able to get a better understanding of what steps WPI needs to take in order to be a leader in providing assistive technologies. Additionally, this visit confirmed the need for an online tutorial website at WPI. The interest of the academic advisor at MIT in my project serves as evidence for the project for the need for this project. Additionally, WPI does not have a fulltime 24/7 accessible center, such as the ATIC at MIT.

9. Requirements and Needs

In order to study the effectiveness of an Online Academic-Support Technology Website and to understand the needs of students the IQP required conducting several interviews and surveys. Originally the purpose was to obtain information from WPI student's by first conducting a small amount of interviews. The information from these interviews would then be used as basis for a survey that would be sent out to a specific focus group at WPI. Although this website database would benefit all students at WPI as well as other individuals, the target for this IQP was for students who receive academic accommodations because of a learning disability. The information from the survey would then be used as support for the project as well as to help guide the project in the right direction.

Several interviews (see **Appendix A**) with WPI students were conducted to design a set of survey questions (see **Appendix C**). One of the challenges with this project is that the structural support for students with academic accommodations at WPI is not developed as other universities. Additionally, WPI has a relative small number of students who need accommodations. The lack of a well-established support center for students with disabilities as well as the small size of this community made it hard to conduct the surveys with WPI students. As a result the IQP team found an alternative group of students from another university that were willing to participate in a study. A survey was designed and conducted by the IQP team for this particular focus group.

9.1 Survey Results

The survey consisted of 13 questions, consisting of 7 multiple choice, 4 open response, and 2 dichotomous questions. The survey was conducted among 20 undergraduate students at a

University in the north eastern United States. Students were instructed to clearly indicate which options they select include a written response to those questions that do not supply options or offer an “other” option if chosen. The survey conducted can be found in **Appendix C**.

9.1.1 Question One

How do you learn best?

This question was a multiple choice question consisting of 3 answers. A student could answer if they were an Auditory, Visual, or Kinesthetic learner. A brief explanation of what each of the learning styles was given next to the option selected. Of the students who were surveyed 50% students answered Visual, 30% answered Kinesthetic, 10% answered Auditory, 5% answered both Visual and Kinesthetic, and 5% answered both Auditory and Kinesthetic. The results to question one are shown below in **Figure 1**.

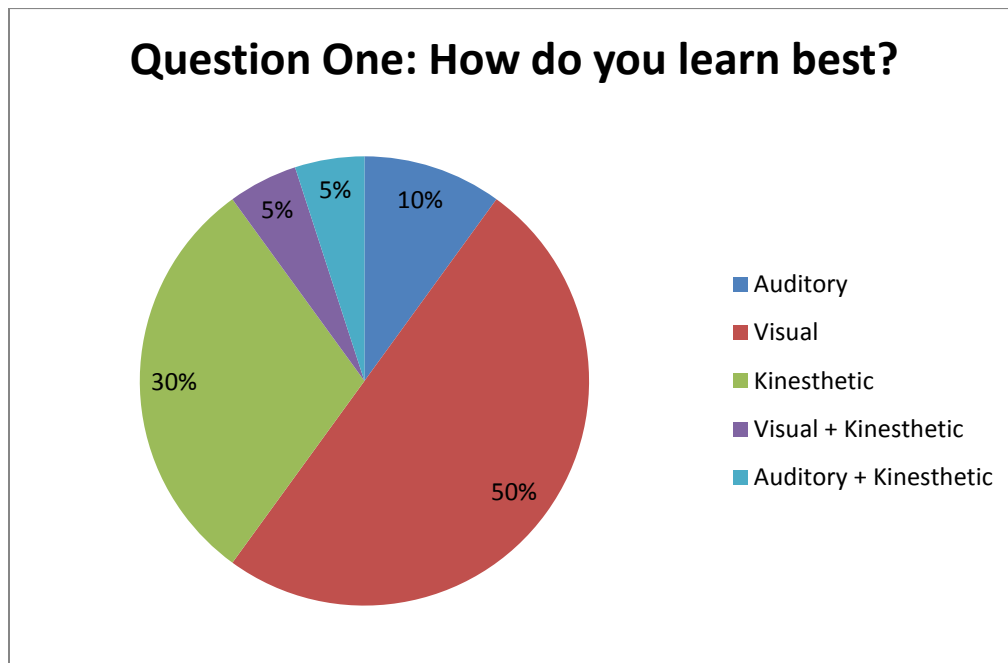


Figure 1: Question One Results

The purpose of this question was to get a better understanding of the learning styles in the sample size of students. This understanding helped draw some more specific conclusions and allowed the IQP team to make connections with information retrieved from other questions. By knowing a student's learning style a conclusion could be made for students with that particular learning style based on how the student answered later questions.

9.1.2 Question Two

*When you hear "Support Technology Software"
What kinds of software come to mind?*

This question was an open response where students were given an area to write a brief response to the question. Of the students who were surveyed, 44% answered with general Assistive Technology answers, 28% answered with specific software or technology like Dragon Naturally Speaking or Kurzweil, 17% had no response to the question, and 11% were not familiar with the terminology. The results to question two are shown below in **Figure 2**.

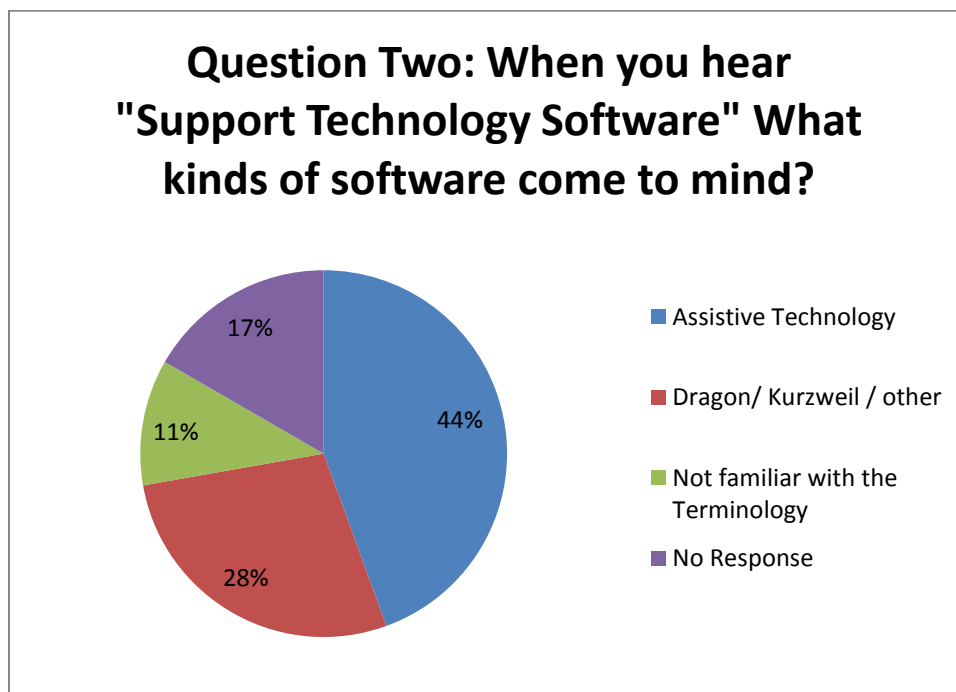


Figure 2: Question Two Results

The purpose of this question was see how many students understood what this term means and for people who are not familiar with the term to give their best guess towards what it could mean. This term was created by the IQP team to reference the software that would be used for the database. The results of this question will allow the IQP team to improve their level of description of the kinds of software that may be used.

9.1.3 Question Three

Do you use Support Technology Software?

This question was a dichotomous question where the students could either answer yes or no. Of the students who were surveyed, 80% responded with “No” and 20% responded with “Yes”. The results to question three are shown below in **Figure 3**.

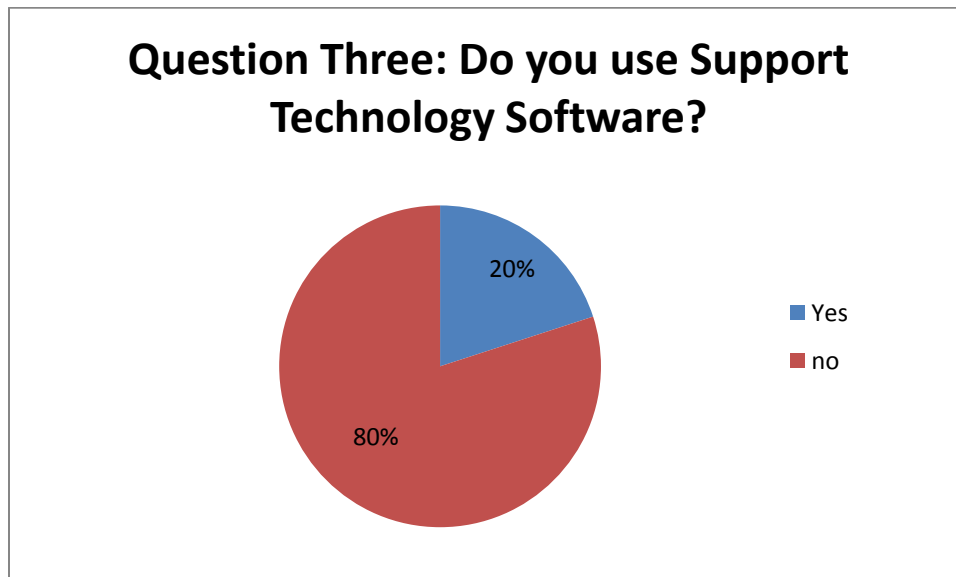


Figure 3: Question Three Results

The purpose of this question was to get an approximation of how many students use support technology software in order to determine if there is a need for the online technology software support website. Based on the results this question if no one uses technology software it speaks to the fact that students are not familiar with the software and the purpose of the

website to inform them about the software is valid. If the majority of people use support technology software the website design might need to be changed to something that more people would find useful.

9.1.4 Question Four

If yes, what technologies are you using?

This question was a multiple choice question consisting of 4 answers. A student could answer Books on CD, Text-to-speech software, Speech-to-text software, or other. The students were given a fill in option where they could write in another technology they were using besides the ones listed in the previous choices. Of the students who were surveyed, 71% did not answer this question, 10% responded with Speech-to-text software, 10% responded with other forms of technologies, and 9% responded with Books on CD. The results to question four are shown below in **Figure 4**.

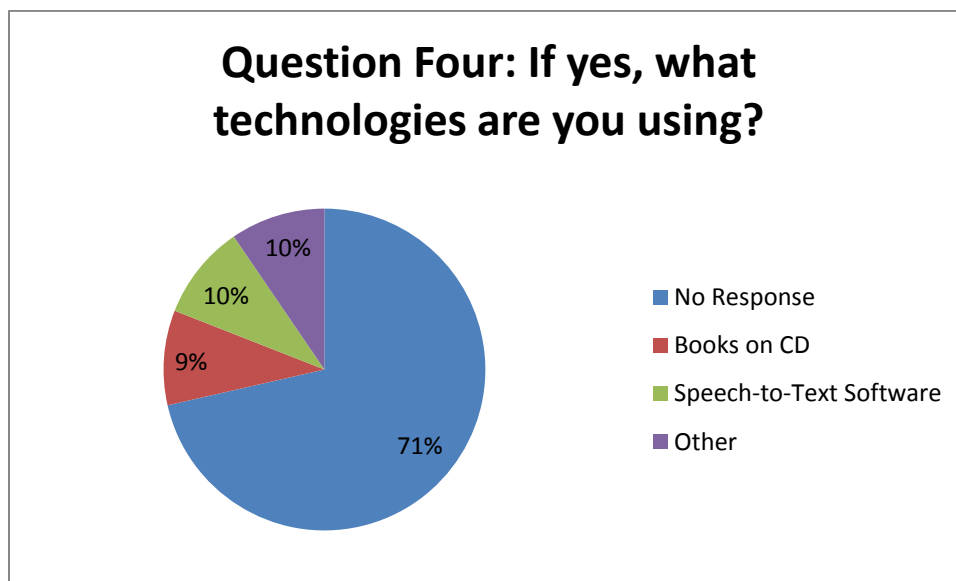


Figure 4: Question Four Results

The purpose of this question was to get an understanding if students are using any support technologies and what specifically which technologies.

9.1.5 Question Five

If you are not using Support Technology Software, why not?

This question was a multiple choice question consisting of 4 answers. A student could answer the question by stating that they are not using support technology software because it is not convenient, not useful, course work doesn't fit, or do not understand how to use. Of the students surveyed, 32% said it doesn't fit their coursework, 27% said they don't understand how to use it, 18% said it was not useful, 14% had no response, and 9% said it was not convenient for them. The results to question five are shown below in **Figure 5**.

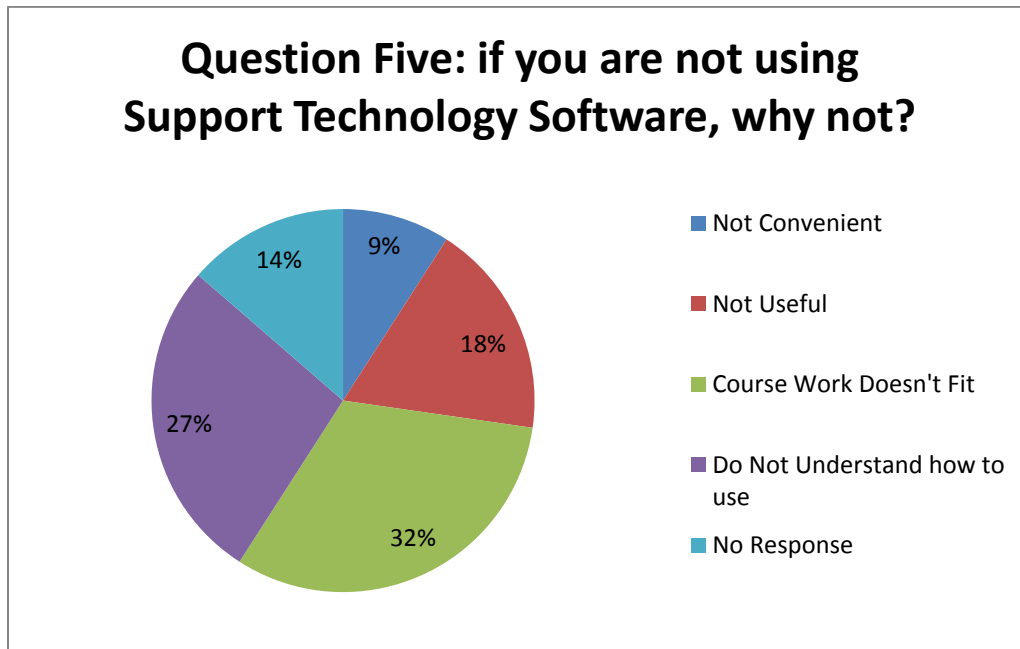


Figure 5: Question Five Results

The purpose of this question was to get a better understand of why students are not using support technology software in order to derive an approach of convincing them to give Support Technology Software chance after using the website.

9.1.6 Question Six

*If someone shows you how Support Technology Software
Could be useful in your course work would you be willing to try it?*

This question was an open response where students were given an area to write a brief response to the question. The response for this question was very clear where 70% students answered yes, 15% answered no, and 15% had no response. The results to question six are shown below in **Figure 6**.

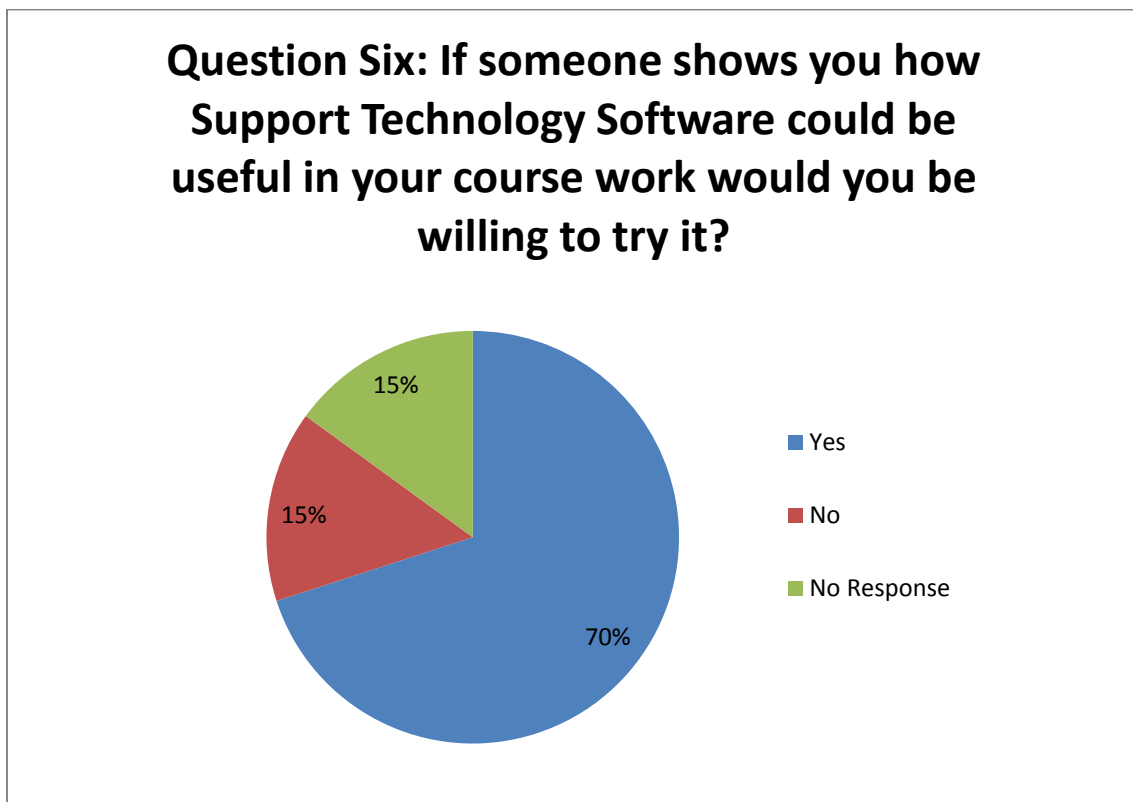


Figure 6: Question Six Results

The purpose of this question was to gain an understanding of those students who don't use support technology software, if given the opportunity would they ever be willing to try it.

9.1.7 Question Seven

Are you familiar with Kurzweil?

This question was a dichotomous question where the students could either answer yes or no. Of the students who were surveyed, 90% said no, 5% said yes, and 5% had no response. The results to question seven are shown below in **Figure 7**.

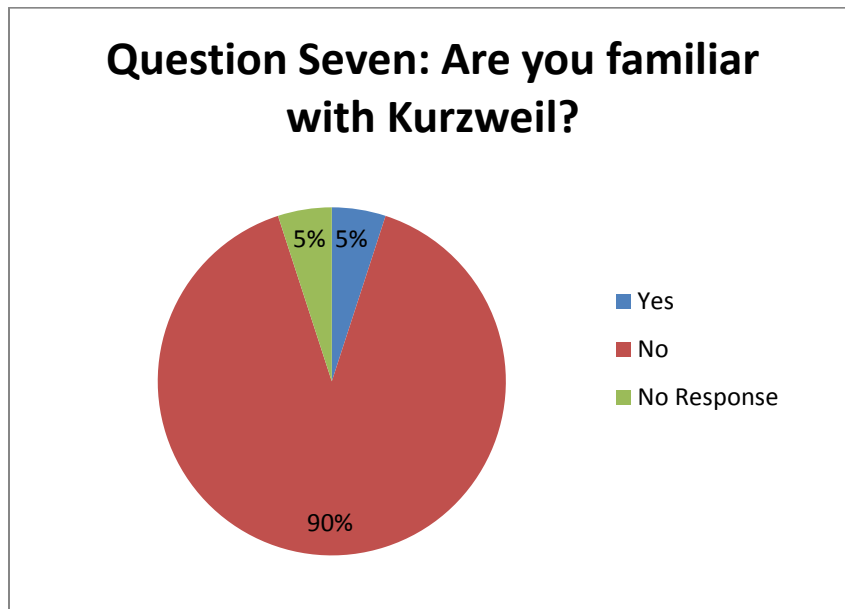


Figure 7: Question Seven Results

The purpose of this question was to gain an understanding of how many people know what Kurzweil is.

9.1.8 Question Eight

How do you use the Kurzweil software? Check all that apply.

This question was a multiple choice question consisting of 5 answers. A student could answer that they use the WPI version, their own version, use Kurzweil to take tests and for written assignments, use Kurzweil to read textbooks, or use Kurzweil to access the internet. Of

the students surveyed, 95% had no response and 5% said that they use Kurzweil to take tests and for written assignments. The results to question eight are shown below in **Figure 8**.

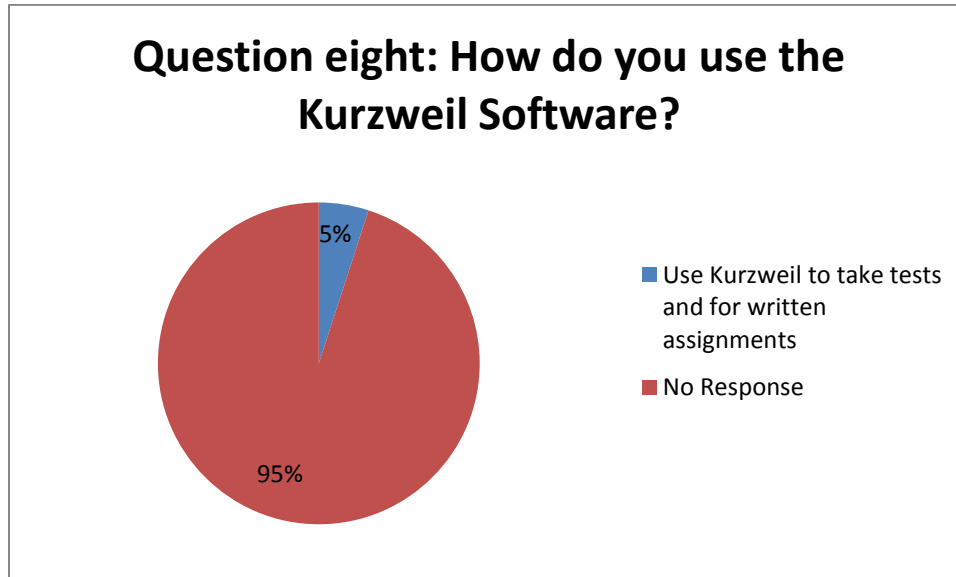


Figure 8: Question Eight Results

The purpose for this question was to understand what students use Kurzweil for and to make sure that students who used Kurzweil actually are using it for an appropriate reason.

9.1.9 Question Nine

*For those students who do not use Kurzweil, Kurzweil is a text-to-speech software.
Would you be interested in...*

This question was a multiple choice question consisting of 3 answers. A student could answer that they were interested in learning more about this software, learning how to use it for classes, homework, and tests, or learning how you can ask for this accommodation. Of the students who were surveyed, 50% said they would use it for classes, homework, and tests, 34% said they would want to learn more about this software, 8% said they would want to learn how to ask for this accommodation, and 8% had no response. The results to question nine are shown below in **Figure 9**.

Question Nine: For those students who do not use Kurzweil, Kurzweil is a text-to-speech software. Would you be interested in:

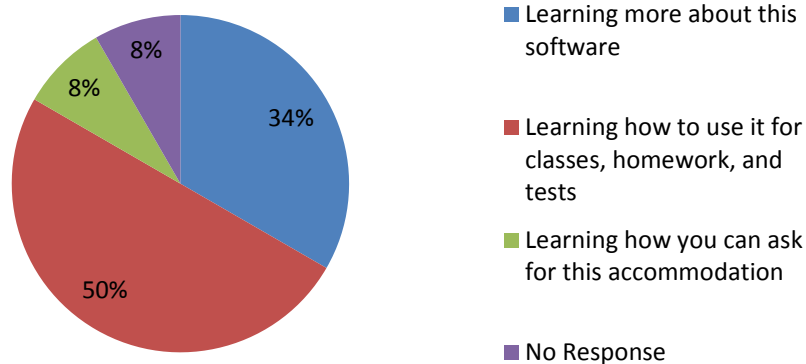


Figure 9: Question Nine Results

The purpose to this question was to understand what types of applications would people use Kurzweil if they don't use it currently.

9.1.10 Question Ten

What do you think are some of the drawbacks to using support technology software?

This question was a multiple choice question consisting of 4 answers. A student could answer that the drawback to using support technology software was that it was not convenient, professors don't know how to support it, that it doesn't work with their computer, or another fill in the blank response. Of the students who were surveyed, 42% said that professors do not know how to support the software, 23% said that it's not convenient, 19% said that it would not work with their computer, and 16% had other responses. The results from question ten are shown below in **Figure 10**.

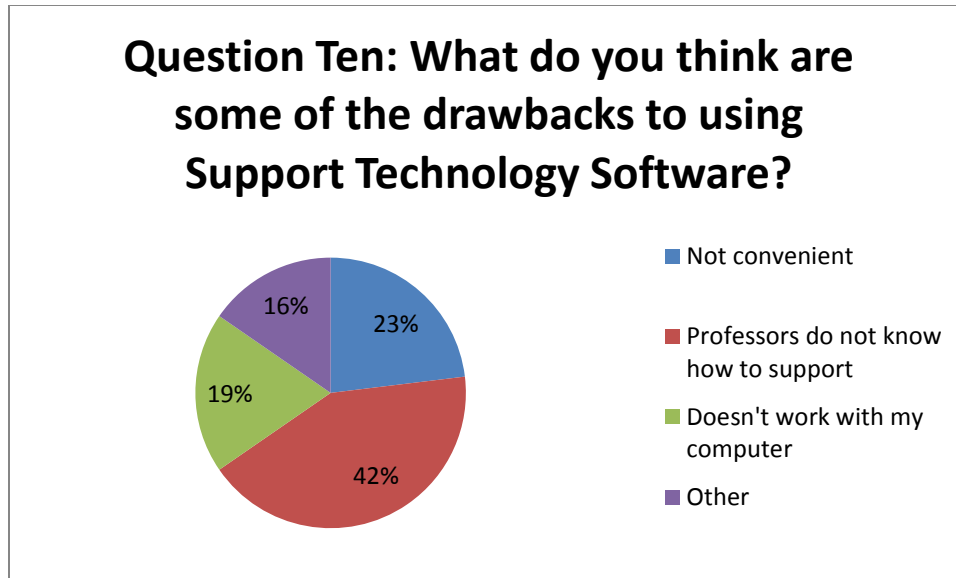


Figure 10: Question Ten Results

The purpose of this question is to understand the flaws of using support technology in general from students who either use or don't use the software.

9.1.11 Question Eleven

Would you find online short tutorials on how to use Support Technology Software helpful?

This question was a multiple choice question consisting of 4 answers. A student could answer that they would find short tutorials helpful by responding that yes they like online technology, yes that they could access more information, yes that they could perform better on my tests and assignments, or no that they would not use this resource. Of the students who were surveyed, 35% said yes and that they could access more information, 31% said yes that they like using online technology, 26% said no they would not use this resource, only 4% said they would perform better on my tests and assignments, and 4% had no response. The results from question eleven are shown below in **Figure 11**.

Question Eleven: Would you find online short tutorials on how to use Support Technology Software helpful?

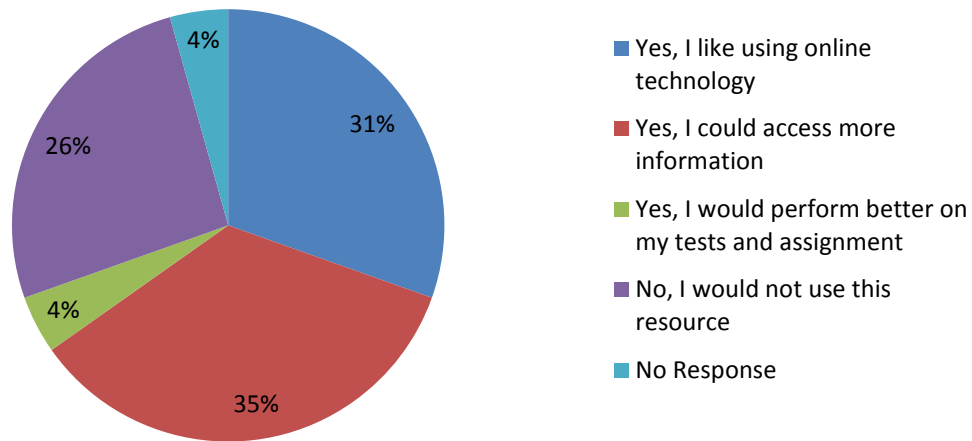


Figure 11: Question Eleven Results

The purpose for this question is to see if students would find the short tutorials on the website helpful in regards to several topics.

9.1.12 Question Twelve

Are there any specific online resources/websites/tutorials which you have used in the past and found helpful? Please list.

This question was an open response question in which students could list any specific resource they found helpful in the past. The question gave them three categories to point them in the right direction including online resources, websites, and tutorials. There was not any conclusive response to this question.

9.1.13 Question Thirteen

What is the most important aspect that should be taken into consideration when designing a website layout?

This question was an open response question in which students could give their opinion of what the most important aspect that should be taken into consideration when designing a website layout. Every student surveyed has a different response but some of the responses included that the website should be “clear and convenient with a user-friendly interface”. The purpose of this question was to get a general idea of what students like the most about particular website. These students would potentially be someone who would use the website in the future.

9.2 Discussion

The results from this survey provide information to the IQP team in regards to the current status of the academic accommodation environment at WPI, connections and conclusions, and ideas for future research. The data collected used to discuss specific patterns, conclusions, theories, and future research.

The survey began by asking the participant their learning style which allowed the results to get a better understanding of the learning preferences of those individuals who took the survey. A closer look into the percentages revealed that the sample of students collected resembled the national averages for kinesthetic, auditory, and visual learners. In the survey sample 50% of the students surveyed were visual learners. This percentage is higher than the national average which is closer to 35% to 40% (Performance Learning Systems, 2010). In the sample of students 30% were kinesthetic learners compared to the average of 35% (Performance Learning Systems, 2010). In the sample of students 10% were auditory which is slightly less than the average of 10% to 15% (Performance Learning Systems, 2010). The distribution of learning

styles matches closely to the average so it can be concluded that this sample population that was surveyed closely resembles the nation. This question helped to determine that the primary audience that would be interacting with the website would be primarily visual and kinesthetic learners. Future research could be done to compare learning styles with the results of the other questions or for support technology software in general. For example, the majority of kinesthetic learners answered question eleven by stating that they would find online short tutorials on how to use support technology software helpful. A graph of the nation learning styles is shown below in

Figure 12.

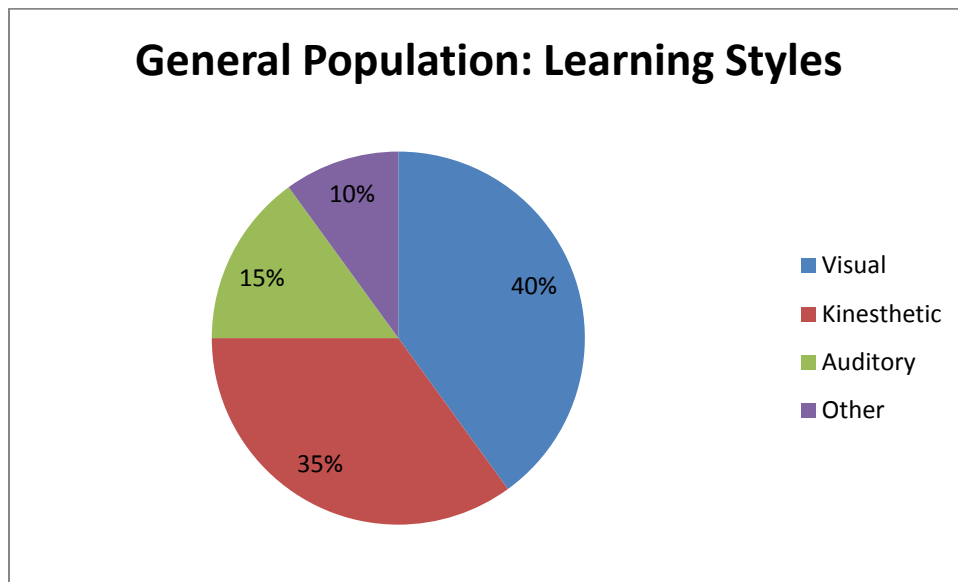


Figure 12: General Population for Learning Styles (Performance Learning Systems, 2010)

Even though the students surveyed would most likely benefit from using support technology software, the majority of the population sampled does not use any type of support software. There were a few students who were familiar with software and even a smaller number who were familiar with the Kurzweil technology. This information shows that there is a need to provide awareness of available software and technologies that could benefit student learning.

When asking question three in the survey which is “Do you use Support Technology Software?” it was clear that the majority of students do not use software based on their response. However this response could be caused by the fact that the majority of students who said that they do not use software maybe do not understand the terminology in the question. It would be hard for a student to determine if a student does not know what support technology software entails. Future research is needed to investigate this possibility.

The response from question four suggested that students were not using support technology software. Question five was particularly interesting because it shows that the majority of students thought support technology software was convenient but they did not understand how to use it and how it would fit into their course work. This data provides support for the need of an online tutoring service.

The response from question six clearly indicates that there is interest in this project when 70% of the sampled population says that if someone shows them how support technology software could be useful in their course work that they would be willing to try it. However it could also be stated from the results of question two that the term “Support Technology Software” might not be the best term to use to describe the software that will be included in the websites database.

For questions seven to nine, students were asked about the Kurzweil software explained in **Appendix H**. Since most students were not familiar with support technology the response from questions seven and eight were consistent because very few students were familiar with the Kurzweil software. However question nine showed that although most students were not familiar with this software, 84% of students said that they would like to learn how to use the software for their classes, homework, and tests.

The results from question ten indicate that professors need to incorporate support software into the classroom. This result enforces the need for the proposed website and for professors to use as a resource to get familiar with other types of software that are available for students. Once available, professors can guide their students to the website for more information regarding specific software. The response from this question also speaks to the issue that there is not enough awareness in the community about technology software. Several students mentioned that the software was not convenient which brings up the question of why? This question could be answered in a future survey, study, or more research.

In addition to the initial requirement gathering, the results of the survey were also used to refine the survey gathering information in the next round of investigations. This improved version of the survey is shown in **Appendix D**. The improved survey is to be distributed in follow up studies in future IQPs. In other words, this initial survey served as a guide for future surveys to be conducted in order to obtain more information.

10. Recommendations and Conclusion

10.1 Recommendations

The survey results point to the lack of knowledge by students and a lack of use of available software as academic accommodations. There is also data which suggests that students are willing to try new technology, but are concerned that professors do not know how to incorporate such technology into the classroom. In order for the proposed online tutorial library to be successful, there needs to be more information about established services and the development of student support groups at WPI. It would be recommended that in order for the website to be successful the community and institution as a whole need to go through several steps before the community is ready to participate in changing the system. As a member of the Accessibility Alliance at WPI (a group established to raise awareness and educate the WPI community, in support of students with academic accommodations) I hope to improve visibility and community awareness of academic accommodations on campus. As a student organization, the group will help with providing awareness and connection from a student perspective. The website that will be created can act as a vehicle for accessibility awareness and empower students to talk to professors about support technology software. This project relates to the structure of WPI and determining a way to improve the academic accommodation system.

The next step in the project would be designing and creating a prototype website by researching the design process. In the future the website will be designed with Dreamweaver to create the website design. The website design will include professors Djamasbi's expertise on website design and eye tracking (Djamasbi, 2010). The design of the outline of the website was completed as a basic concept. The website outline consists of having several pages each with its

own specific description. The home page will have general academic support links and a welcome link and welcome information regarding the website. The other major tabs will include the accommodation tools available at WPI for students to use including Kurzweil which is a text-to-speech software tool and other tutorials. The tutorials will be captured using the Camtasia software and imbedded into the website for easy access.

Once a prototype is designed it will need to be tested and implemented. It is recommended that tutorials describing how to use Kurzweil to be included along with other Support Technology Software. These tutorials should be tested for usability and effectiveness in the future.

10.2 Conclusion

This IQP focused on creating a foundation for future research to develop an online learning environment that would allow building blocks of future innovations to be placed to improve and develop the design. The next step in a follow up project would include the development of a website prototype.

The website and all of its online content and resources should be designed in a way that makes complete access possible and meets the needs of the target audience. A website cannot be built for everyone and therefore several decisions need to be made in the future regarding how to develop the website for a specific target audience. There are plenty of opportunities in the future to fully develop the system. Based on the results of all the research conducted it can be concluded that this proposed website design would benefit the WPI community.

Brian and professor Djamasbi have a great interest in this project and both are committed to continue working with the Office of Disability Services at WPI on this project after the completion of this IQP. This document serves as proof of concept for the need of an Online Academic Technology Support Website (OATSW) at WPI and serves as the basic step for future projects that aim at implementing the OATSW.

11. Appendix

11.1 Appendix A – IQP Interview – Draft I

1. How do you learn best?
 - Auditory learner – When someone explains it to you in words
 - Visual learner – When someone explains things to you in pictures
 - Kinesthetic – When you work through the problems yourself
2. When you hear “Support Technology Software” what kinds of software comes to mind?
3. Do you use support technology software?
 - Yes
 - No
4. If yes, what technologies are you using?
 - Books on CD
 - Text-to-speech software
 - Speech –to-text software
 - Other _____
5. If you are not using Support Technology Software, why not?
 - Not convenient
 - Not useful
 - Course work doesn’t fit
 - Do not understand how to use
6. If someone shows you how it could be useful in your course work would you be willing to try it?
7. Are you familiar with Kurzweil?
 - Yes, if you answered yes, go to question 6.
 - No, if you answered no, go to question 7.
8. How do you use the Kurzweil software? Check all that apply.
 - Use WPI version
 - Use my own copy of the software
 - Use Kurzweil to take tests and for written assignments
 - Use Kurzweil to read textbooks
 - Use Kurzweil to access the Internet
9. For those students who do not use Kurzweil, the Kurzweil text-to-speech software is available to WPI students who qualify for this academic accommodation. Would you be interested in:
 - Learning more about this software
 - Learning how to use it for classes/homework/tests
 - Learning how you can ask for this accommodation
10. What do you think are some of the drawbacks to using support technology software?
 - Not convenient
 - Professors do not know how to support
 - Doesn’t work with my computer
 - Other _____

11. Would you find online short tutorials of Support Technology Software helpful in your studies at WPI?
 - a. Specifically showing you how to learn how to use it for your homework/school projects.
 - Yes, I like using online technology
 - Yes, I could access more information
 - Yes, I would perform better on my tests and assignment
 - No, I would not use this resource
12. Are there any specific online resources/websites which you have used in the past and found helpful? Please list.
 - Online resources: _____
 - Websites: _____
 - Tutorials: _____

Objective outline

- What Kind of Learner are you?
- You ask them to define “Support Technology Software”
- When you hear “Support Technology Software” what comes to you mind?
 - Info about their state of mind
- If they don’t use “Support Technology Software”
 - Yes → What?
 - No → give examples? Like Siri
- If they use Kurzweil?
 - Is it useful?
 - Do they like it
 - What are problems with it?

11.2 Appendix B – IQP Sample Interview

1. How do you learn best?
 - Kinesthetic
2. When you hear “Support Technology Software” what kinds of software comes to mind?
 - Smart Pens
3. Do you use support technology software?
 - No
4. If you are not using Support Technology Software, why not?
 - Not Necessary
5. If someone shows you how it could be useful in your course work would you be willing to try it?
6. For those students who do not use Kurzweil, the Kurzweil text-to-speech software is available to WPI students who qualify for this academic accommodation. Would you be interested in:
 - Learning more about this software
 - Learning how to use it for classes/homework/tests
 - Learning how you can ask for this accommodation

7. What do you think are some of the drawbacks to using support technology software?
 - Not convenient
 - Professors do not know how to support
 - Doesn't work with my computer
8. Would you find online short tutorials of Support Technology Software helpful in your studies at WPI?
 - a. Specifically showing you how to learn how to use it for your homework/school projects.
 - Yes, I like using online technology
9. Are there any specific online resources/websites which you have used in the past and found helpful? Please list.
 - Online resources: Google
 - Tutorials for Maya/Photoshop

11.3 Appendix C – IQP Survey – Draft I

Online Academic-Support Technology Website and Library Database IQP

Directions - Please indicate which options you have selected. Please include a written response to those questions that do not supply options or offer an “other” option if chosen.

1. How do you learn best?
 - Auditory learner – When someone explains it to you in words
 - Visual learner – When someone explains things to you in pictures
 - Kinesthetic – When you work through the problems yourself
2. When you hear “Support Technology Software” what kinds of software come to mind?
3. Do you use Support Technology Software?
 - Yes
 - No
4. If yes, what technologies are you using?
 - Books on CD
 - Text-to-speech software
 - Speech –to-text software
 - Other: _____
5. If you are not using Support Technology Software, why not?
 - Not convenient
 - Not useful
 - Course work doesn't fit
 - Do not understand how to use

6. If someone shows you how Support Technology Software could be useful in your course work would you be willing to try it?
7. Are you familiar with Kurzweil?
 - Yes, if you answered yes, go to question 8.
 - No, if you answered no, go to question 9.
8. How do you use the Kurzweil software? Check all that apply.
 - Use WPI version
 - Use my own copy of the software
 - Use Kurzweil to take tests and for written assignments
 - Use Kurzweil to read textbooks
 - Use Kurzweil to access the Internet
9. For those students who do not use Kurzweil, Kurzweil is a text-to-speech software. Would you be interested in:
 - Learning more about this software
 - Learning how to use it for classes/homework/tests
 - Learning how you can ask for this accommodation
10. What do you think are some of the drawbacks to using support technology software?
 - Not convenient
 - Professors do not know how to support
 - Doesn't work with my computer
 - Other: _____
11. Would you find online short tutorials on how to use Support Technology Software helpful?
 - Yes, I like using online technology
 - Yes, I could access more information
 - Yes, I would perform better on my tests and assignment
 - No, I would not use this resource
12. Are there any specific online resources/websites which you have used in the past and found helpful? Please list.
 - Online resources: _____
 - Websites: _____
 - Tutorials: _____
13. What is the most important aspect that should be taken into consideration when designing a website layout?

11.4 Appendix D – IQP Survey – Draft II

Online Academic-Support Technology Website and Library Database IQP

Directions - Please indicate which options you have selected. Please include a written response to those questions that do not supply options or offer an “other” option if chosen.

13. How do you learn best?

- Auditory learner – When someone explains it to you in words
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree
- Visual learner – When someone explains things to you in pictures
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree
- Kinesthetic – When you work through the problems yourself
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree

14. When you hear “Support Technology Software” what kinds of software come to mind?

15. Do you use support technology software?

- Yes
- No

16. If yes, what technologies are you using?

- Books on CD
- Text-to-speech software
- Speech –to-text software
- Other: _____

17. How satisfied are you with Support Technology Software?

- Very Satisfied
- Satisfied
- Neutral

- Dissatisfied
 - Very Dissatisfied
18. What do you think are some of the drawbacks to using support technology software?
- Not convenient
 - Professors do not know how to support
 - Doesn't work with my computer
 - Other: _____
19. If someone shows you how Support Technology Software could be useful in your course work would you be willing to try it?
- No interest
 - Little interest
 - Some interest
 - Moderate interest
 - Considerable interest
20. If you are not using Support Technology Software, why not? For each reason please indicate your level of agreement.
- Not convenient
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree
 - Not useful
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree
 - Course work doesn't fit
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree
 - Do not understand how to use
 - Strongly Agree
 - Agree
 - Neutral
 - Disagree
 - Strongly Disagree
 -
21. Would you find online short tutorials on how to use Support Technology Software helpful?

- Yes, I like using online technology
- Yes, I could access more information
- Yes, I would perform better on my tests and assignment
- No, I would not use this resource

22. Are there any specific online resources/websites which you have used in the past and found helpful? Please list.

- Online resources: _____
- Websites: _____
- Tutorials: _____

23. What format for learning how to use Support Technology Software would be most helpful?

- Information Sessions
 - Not at all helpful
 - Not so helpful
 - Neither
 - Somewhat Helpful
 - Very helpful
- Online text walkthroughs
 - Not at all helpful
 - Not so helpful
 - Neither
 - Somewhat Helpful
 - Very helpful
- Online Video/Audio Tutorials
 - Not at all helpful
 - Not so helpful
 - Neither
 - Somewhat Helpful
 - Very helpful
- Other: _____

24. Are you familiar with Kurzweil?

- Yes, if you answered yes, go to question 13.
- No, if you answered no, go to question 14.

25. How do you use the Kurzweil software? Check all that apply.

- Use the school's version
- Use my own copy of the software
- Use Kurzweil to take tests and for written assignments
- Use Kurzweil to read textbooks
- Use Kurzweil to access the Internet

26. For those students who do not use Kurzweil, the Kurzweil text-to-speech software.

Would you be interested in:

- Learning more about this software
- Learning how to use it for classes/homework/tests
- Learning how you can ask for this accommodation

11.5 Appendix E – IQP Survey Question Types

Satisfaction

Question: How satisfied are you with...?

1. Very Dissatisfied
2. Dissatisfied
3. Neither Satisfied nor Dissatisfied
4. Satisfied
5. Very Satisfied

Agreement

Question: Please state your level of agreement with...

1. Strongly Disagree
2. Disagree
3. Neither Agree nor Disagree
4. Agree
5. Strongly Agree

Extent

Question: To what extent do you...?

1. Not at all
2. To little extent
3. To some extent
4. To a moderate extent
5. To a large extent

Helpfulness

Question: How helpful is...?

1. Not at all helpful
2. Not so helpful
3. Neither
4. Somewhat Helpful
5. Very helpful

Interest

Question: Please indicate your degree of interest in...

1. No interest
2. Little interest
3. Some interest
4. Moderate interest
5. Considerable interest

Relative Quality

Question: should... do less or more of...?

1. Much less
2. Somewhat less
3. Fine as is
4. Somewhat more
5. Much more

Importance

Question: How important to you is...?

1. Very Unimportant
2. Somewhat Unimportant
3. Neither Important nor Unimportant
4. Somewhat Important
5. Very Important

Quality Rating

Question: Please rate the quality of...

1. Poor
2. Below Average
3. Average
4. Above Average
5. Excellent

11.6 Appendix E – IQP Vocab Table

Table 1: IQP Vocab Table

Vocab	Definition
Accommodation	A reasonable accommodation is any modification or adjustment to a job or the work environment that will enable a qualified applicant or employee with a disability to participate in the application process or to perform essential job functions. Reasonable accommodation also includes adjustments to assure that a qualified individual with a disability has rights and privileges in employment equal to those of employees without disabilities. ("Accessibility Vocabulary")
Accessibility	As required by the Americans with Disabilities Act, removal of barriers that would hinder a person with a disability from entering, functioning, and working within a facility. Required restructuring of the facility or programs cannot cause undue hardship for the employer. ("Accessibility Vocabulary")
Assistive Technology	Tools which enable a person to perform essential job/curricular functions. ("Accessibility Vocabulary")
Disability	A person with a disability is an individual with a physical or mental impairment that substantially limits one or more major life activities. ("Accessibility Vocabulary")
Universal Design	Universal Design becomes a framework for teaching and learning that addresses the widest possible variety of learning needs, styles, and preferences. It recognizes that each of us has preferred modes of receiving and processing information or demonstrating knowledge and abilities. UDL provides rich supports for learning and reduces barriers to the curriculum while maintaining high achievement standards for all. UDL calls for the integration of multiple means of representation, action and expression, and engagement into course curriculum. ("Accessibility Vocabulary")

11.7 Appendix F – IQP Outline

Table 2: IQP Outline

A Term		
Week #	Website Outline	IQP Document Outline
Week 1 DONE	<ul style="list-style-type: none"> • Finalize IQP Plan • Improve outline 	<ul style="list-style-type: none"> • Determining means of recording work done on IQP
Week 2 DONE	<ul style="list-style-type: none"> • Get Permission from software/Program Companies to use their software? • Address all Legal issues. 	<ul style="list-style-type: none"> • Document contact with companies • Begin research for outline
Week 3 DONE	<ul style="list-style-type: none"> • Learn how to use Video Capturing Software? • Camtasia? • Contact Jim Monaco about Camtasia/HTML/Website 	<ul style="list-style-type: none"> • Finalize a rough draft of the outline for the IQP paper
Week 4 DONE	<ul style="list-style-type: none"> • Creating a Website using HTML/Python • WPI – Basic HTML 	<ul style="list-style-type: none"> • Begin writing detailed sections for the outline
Week 5 DONE	<ul style="list-style-type: none"> • Determine Survey methods and questions • User requirement • Determine focus groups • Market Analysis 	<ul style="list-style-type: none"> • Brainstorm Website Template Ideas • Start Market Analysis • Type up all meeting notes
Week 6 DONE	<ul style="list-style-type: none"> • Draft Survey • Draft Interview 	<ul style="list-style-type: none"> • Add Focus group topic to IQP Paper
Week 7 DONE	<ul style="list-style-type: none"> • Send out Email For Interviews • Outline for Website should be finished • IQP Paper Outline/Draft 	<ul style="list-style-type: none"> • Outline of IQP should be done with several sections written or otherwise outlined.

B Term

Week 8 DONE	<ul style="list-style-type: none"> • Continue with Interviews • Improve Interview Questions • Plan out the rest of B term 	<ul style="list-style-type: none"> • Continue writing Sections for IQP Document
Week 9 DONE	<ul style="list-style-type: none"> • Conduct Surveys 	<ul style="list-style-type: none"> • Continue writing Sections for IQP Document
Week 10 DONE	<ul style="list-style-type: none"> • Conduct Surveys 	<ul style="list-style-type: none"> • Finalizing IQP Document.
Week 11 DONE	<ul style="list-style-type: none"> • Conduct Surveys 	<ul style="list-style-type: none"> • IQP Document Revision
Week 12 DONE	<ul style="list-style-type: none"> • Conduct Surveys 	<ul style="list-style-type: none"> • IQP Document Revision
Week 13 DONE	<ul style="list-style-type: none"> • Analyze Surveys 	<ul style="list-style-type: none"> • IQP Document Revision
Week 14 DONE	<ul style="list-style-type: none"> • Finish IQP documentation. 	<ul style="list-style-type: none"> • IQP Document Revision

11.8 Appendix G – Assistive Technologies at MIT Handout



Information Services & Technology

ATIC – Assistive Technology Information Center

MIT Room 7-143 · atic@mit.edu · 617.253.7808 · web.mit.edu/atic/www

Assistive Technologies at MIT

Alternative/Ergonomic Pointing Devices and Keyboards

- Please see separate handout

Braille Devices / Translation / Embossing

- Braille Slate and Stylus
- Perkins Braille Typewriter www.perkins.org/store/brailers/\$750
- Duxbury Braille Translation software - www.duxburysystems.com/ \$600
- ViewPlus Premier 100 Embosser and Tiger Software – www.viewplus.com/\$5-10K[embosser]
\$300-500[software]

Head-Pointing Devices

- Camera Mouse - www.cameramouse.orgFree
- NaturalPoint SmartNav - www.naturalpoint.com\$500

Magnification and Low-Vision Tools

- Acrobat LCD Video Magnifier - www.enhancedvision.com\$2300-2700
- Amigo Handheld Magnifier - ulva.com/Online-Store/Video-Magnifiers/amigo.htm\$1695
- The Note-Taker - www.haydenat.com/\$2000
- VisioVoice (Mac only) www.assistiveware.com/product/visiovoice.....\$250
- ZoomText (Windows Only) - www.aisquared.com\$600-1000

Math Tools

- MathTalk metroplexvoice.com/ (requires Dragon NaturallySpeaking 11 and Scientific Notebook)...\$300
- MathType Equation Editor www.dessci.com/en/products/mathtype/.....\$60
- Orion Talking Scientific Calculator..... \$250
- Visable Scientific Calculator \$260

Mouse Clicking Software

- SmartClick (Mac/Windows) - www.rjcooper.com/smartclick/\$120
- ClickNoMo (Mac Only) - www.clicknomo.com/\$29
- DwellClicker (Windows Only) - www.sensorysoftware.com/dwellclicker.htmlFree

Note-Taking Devices

- NEO - www.neo-direct.com/default.aspx\$170-200
- ECHO Smart Pen - www.livescribe.com/smartpen/index.html\$50-90



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One-handed Keyboards

- BAT Keyboard - www.infogrip.com\$205
- Frogpad - www.frogpad.com\$140-150
- Half Keyboard - www.matias.ca/halfkeyboard/\$600

Operating System Accessibility Options

- Ubuntu Linux - help.ubuntu.com/community/Accessibility
- Mac - www.apple.com/accessibility/macosex/vision.html
- Windows - windows.microsoft.com/en-US/windows/help/accessibility

Organizational Tools (Diagramming)

- Inspiration - www.inspiration.com\$70

Reading Software and Devices

- iPad apps: Read2Go, LearningAlly
- FS Reader (software) - www.freedomscientific.com/products/fs/fsreader-product-page.asp.....Free
- GhostReader www.convenienceware.com/product/ghostreader..... \$40
- Kurzweil 1000 (Windows Only) - www.kurzweiledu.com \$1000
- Kurzweil 3000 - www.kurzweiledu.com\$400, \$1100-\$1500
- Victor Reader Stream - www.humanware.com/en-us/products/blindness/dtb_players/compact_models/details/id_81/victorreader_stream.html\$360

Screen Reading Software

- JAWS (Windows Only) - www.freedomscientific.com\$900-1100
- VoiceOver for Mac OS X - www.apple.com/accessibility/voiceover/Featured in all OS X

Speech Recognition Software

- Dragon NaturallySpeaking (Windows Only) - www.nuance.com/\$200-800
- Dragon Dictate (Mac Only) - www.nuance.com/\$200-300
- Windows 7 Speech Recognition - windows.microsoft.com/en-us/windows7/What-can-I-do-with-Speech-RecognitionFree with Windows 7
- Utter Command <http://www.redstartsystems.com/>\$300

Typing Break and Ergonomics Software

- Stretch Break (Mac/Windows) - ist.mit.edu/stretchbreakFree with MIT certificates
- Time Out (Mac) - www.dejal.com/timeout/Free
- Workrave (Windows/Linux) - www.workrave.org/Free
- Xwrits (Linux) - www.lcdf.org/xwrits/Free

11.9 Appendix H – Kurzweil Software

Kurzweil is an assistive technology, text to speech, learning tool that supports the concept of Universal Design for Learning with a suite of powerful reading, writing, test-taking, and study skill tools that makes curriculum accessible to all students. It is particularly appropriate for students with learning disabilities such as Dyslexia, those who require reading intervention, students struggling with reading comprehension and English Language Learners (ELL).(Kurzweil)

Kurzweil has played a large part in academic success by providing me a way to read and write. I started using Kurzweil in Middle school for my MCAS tests so I was able to listen to each question of the exam and read along to speed up my test taking and allow me to gather more information from each test question. In addition to the normal text-to-speech functionality, Kurzweil also offers options to highlight text and extract formatted outlines. These outlines can be produced by from material that was scanned and uploaded to be used with the software.

I have purchased the Kurzweil software to be able to use it in my dorm, at the Library, and in classes, instead of just in the Office of Disabilities at WPI. I have used Kurzweil for any extensive reading and writing assignments including writing this IQP document. Unfortunately because Kurzweil is such an amazing piece of software there is a large cost component and therefore there are many students who don't have access to the technology because of financial reasons.

The Kurzweil Software is a great example of assistive technology software that many students do not understand how to use but would greatly benefit from using it. If the website were to include short online video tutorials and guides on how to use this particular software it

would greatly help students at WPI who would benefit from the text-to-speech component of the software.

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