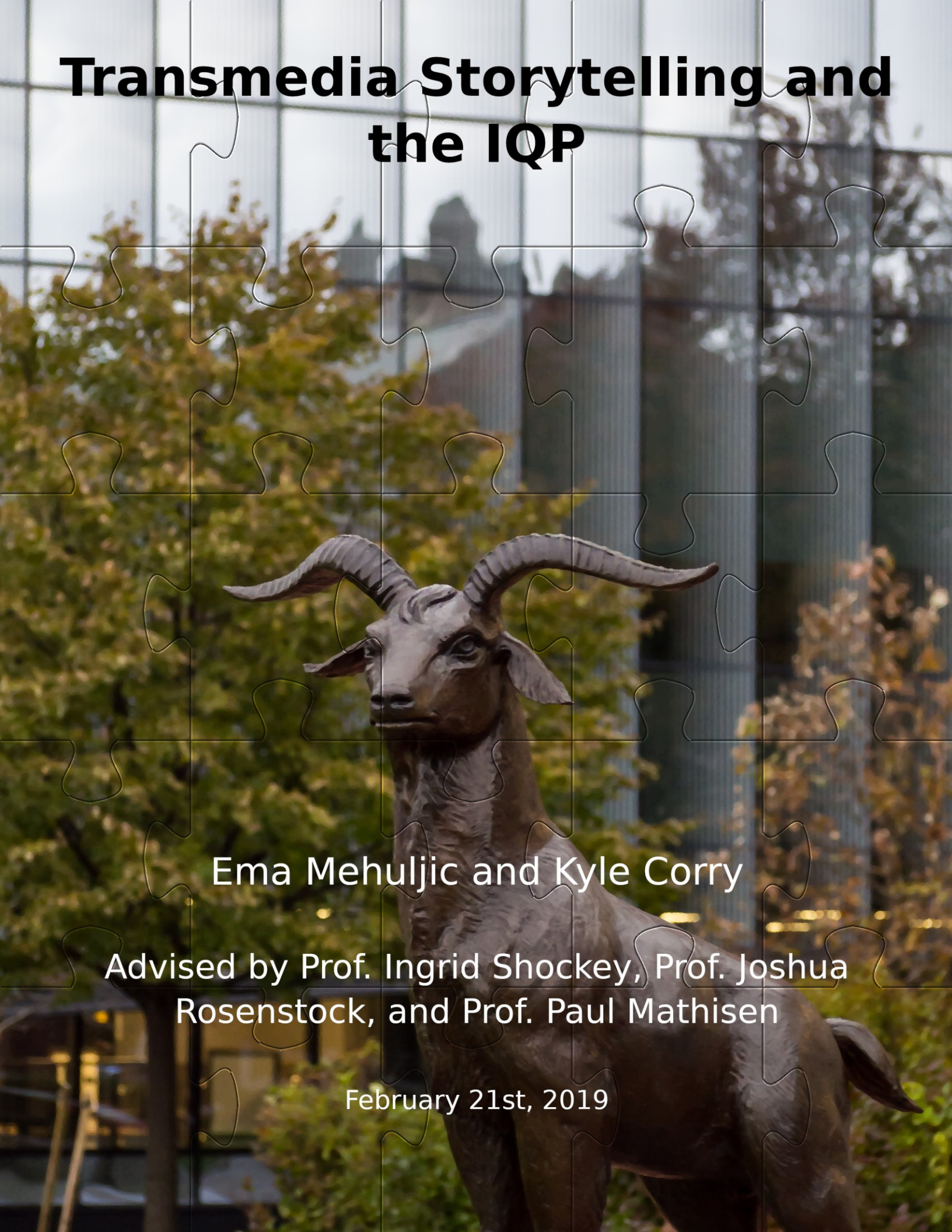
Transmedia Storytelling and the IQP



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Abstract

Transmedia storytelling allows for the development of a story across multiple media platforms with contribution from those who interact with the story. Research outcomes of major projects such as the Interactive Qualifying Project (IQP) at Worcester Polytechnic Institute can be amplified through transmedia storytelling. This project determined the capacity of WPI to provide transmedia resources to help students further their work through immersive media experiences. Our research helped create an interactive guide for transmedia services at WPI.

Executive Summary

Transmedia storytelling is a technique which has the potential to benefit academic projects through increased engagement and impact. Multiple universities have begun to dedicate resources to creating interactive projects through the help of transmedia storytelling. Worcester Polytechnic Institute's Interactive Qualifying Project (IQP) aligns with many principles of transmedia storytelling, and applying this technique can enhance the impact and learning experience for students, faculty, project sites, and the many stakeholders of the IQP. Currently, IQPs have the capacity to integrate multi-media platforms but the logistics of incorporating transmedia storytelling into the core of this project needs to be developed. The goal of our project was to facilitate transmedia storytelling as a means to enhance the impact of the IQP at WPI. The following executive summary briefly explains the research and interviews conducted to create a transmedia storytelling guidebook for the WPI community.

Methodology

In order to gain the background understanding of both transmedia storytelling and the available resources at WPI, we developed the following objectives:

1. *Understand best practices in transmedia storytelling*
2. *Identify transmedia resources and capacities at WPI*
3. *Create and pilot a guide to use transmedia storytelling in WPI projects*

For our first objective, we conducted research on six institutions that have used transmedia storytelling within the higher education setting. Experts in the field of transmedia storytelling were interviewed to identify the best practices.

Our second objective required us to identify facilities on campus and media tools which are integral to media development. We interviewed faculty and staff from the Global Media Lab, Marketing, Undergraduate Admissions, IGSD, and Gordon Library to understand the capacity of WPI to archive, display and create transmedia projects.

We completed our third objective by compiling the information gathered during our first two objectives into a guidebook website which will help the WPI community find resources on transmedia storytelling. We created a mockup of our guidebook and had it evaluated for usability. The website was also tested by several IQP teams to ensure that it contained useful information and was accessible.

Results

After analysis of the various paths of research described above, we developed the following results:

1. Institutions generally have one or more of the three approaches to transmedia storytelling. The three approaches are, the creation of a media lab, book to project adaptation, or college dedicated to media. These approaches use transmedia storytelling as the fundamental building block to help create projects. The use of transmedia storytelling is in the development stages but is gaining traction to become a bigger part of higher education.
2. Experts in the field outlined the importance of subtle details within transmedia storytelling. The experts all mentioned the importance of visuals within projects and that

many depictions do not represent best practices. Best practices need to be taught if students are expected to use them. The experts did acknowledge the need to teach the skills to use media effectively.

3. We identified the Global Lab, ATC, and Gordon Library as media hubs at WPI. Each location hosts a variety of resources that can help create, store, or distribute media. Through these facilities, students will be able to create the necessary media for transmedia projects such as videos and audio (see figure A).

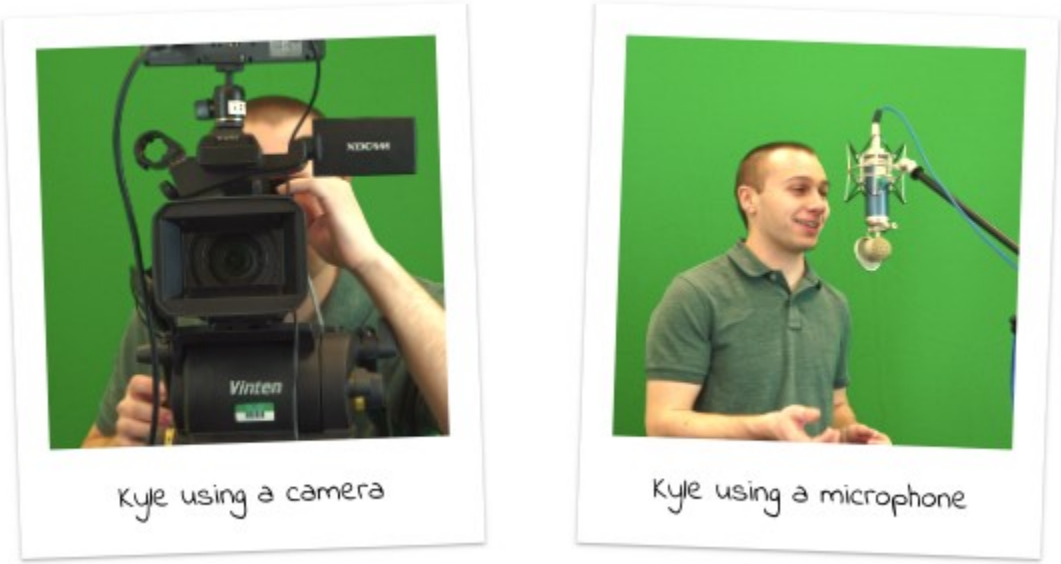

Figure A: Photos of Kyle using the equipment in the Global Lab.

4. Faculty recommended a variety of media that should be incorporated into our guide (see figure B). Our transmedia guide has tutorials, best practices, and other information that reflect the needs and concerns of the faculty.

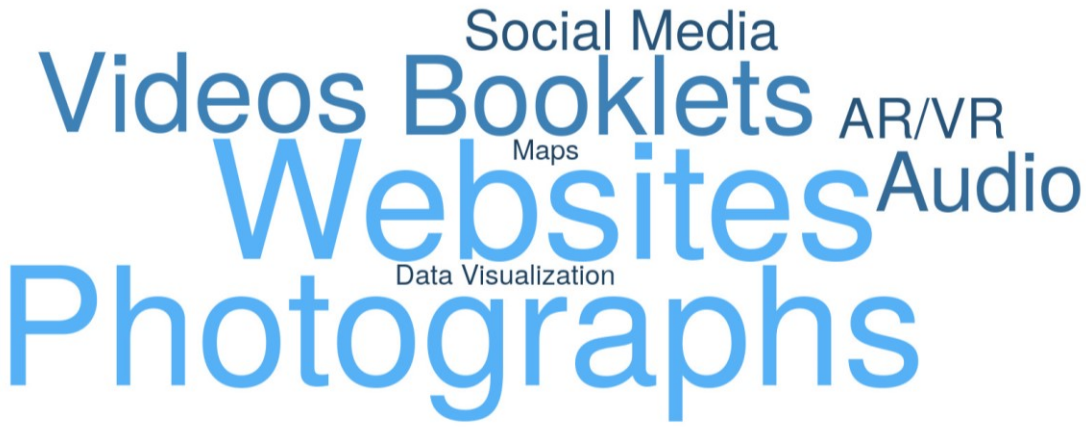

Figure B: A word cloud of the recommended media by our interviewees

The analysis of the results provided a foundation of both the available resources and an indication to the changes that can be made to introduce transmedia storytelling more effectively.

Recommendations

The analysis of our research showed gaps that can be filled regarding the implementation of transmedia storytelling within the IQP. The first recommendation is the creation of Global Lab trainings that reflect the inclusion of transmedia storytelling principles within media to help prepare students for IQP. The second recommendation is a digital exhibition of transmedia IQPs which would show students the potential work that they could be a part of on IQP. The third recommendation is three IQPs for future years that would focus on creating courses for the Global Lab website, working with the Global Lab to tune the space so that students can create high quality transmedia storytelling projects and an IQP that explores how to use transmedia to deliver a message.

Conclusion

This IQP created a foundational understanding of transmedia storytelling within the higher education setting. The interviews with experts, various offices, and research into the current capacities at WPI helped the creation of a transmedia storytelling guide. The guide is meant to be used by students who are interested in adding media to their IQP or other projects. The guide will be able to grow as media changes and concepts evolve. This IQP proposed paths to continue the work that has been started in transmedia storytelling. We hope to see the advancement of the IQP through transmedia storytelling through the years as the knowledge continues to grow.

Acknowledgments

Our team would like to thank the following individuals, organizations, and institutions for their help with our project.

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- The Global Lab co-directors, Professor Stephen McCauley and Professor Leslie Dodson, for sponsoring our guide website, providing input along the way and for offering training sessions which helped determine the content for our guide.

- The faculty and staff at Worcester Polytechnic Institute who interviewed with us and gave us valuable information about the resources and capacities of transmedia storytelling at WPI.

Authorship

This list states the primary authors of each section though many sections were edited by both authors. Any photo without credit was created by the authors of this report.

Ema Mehuljic wrote portions of the Introduction, and Background sections 2.1 on the development of project-based learning, 2.2 on the history of project-based learning at WPI and 2.5 on summarizing the key points of the background. In the Methodology, she wrote section 3.1 on understanding best practices in transmedia storytelling and 3.3 on creating and piloting a guide for transmedia storytelling. In the Results and Discussions, Ema wrote parts of chapter 4 and created Table 5 in 4.1. Ema wrote the abstract, parts of the executive summary and conclusion.

Kyle Corry wrote portions of the Executive Summary, Introduction, and Background sections 2.2 on the WPI Plan, 2.3 on transmedia storytelling, 2.4 on the relevance of transmedia storytelling and case studies. In the Methodology, he wrote sections 3.2 on identifying transmedia resources and capacities at WPI, and 3.4 on the proposed timeline. In the Results and Discussions, Kyle wrote the Objective 2 part of section 4.1 and parts of Objective 3. All photographs were taken by Kyle unless otherwise noted. All data visualizations (charts, word cloud) were created by him, using R and ggplot2. Kyle also created the mockup of the guide using GIMP.

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Glossary

Audacity: A free software alternative to Adobe Audition, used to edit audio recordings.

Booklet format: An IQP format which has many visuals and is usually short (around 30 pages). Booklet format IQPs can also be in landscape format.

Continuity: A single experience spread across multiple stories.

CSS: The programming language used to style webpages.

Data visualization: The displaying of data in a format which is highly visible and allows viewers to extract information. For example, a bar chart is a data visualization.

Drillability: The ability to drill into the depths of a story.

Extractability: The ability to apply aspects from a story to everyday life.

GIMP: A free software alternative to Adobe Photoshop, used to create visuals and edit photos.

ggplot2: A plugin for R which implements some best practices in data visualization.

Global Media Lab: WPI's lab space for students, faculty, clubs, and project teams to develop global engagement projects. Also referred to as the Global Lab in this report.

HTML: The programming/markup language used to create webpages.

Immersion: The ability to enter a story world.

JavaScript (JS): A programming language used to make webpages interactive.

MATLAB: A programming language which is popular in mathematics and can be used for data visualizations.

Matplotlib: A Python library which generates plots/graphs from data.

Media hub: A term we created to describe locations on campus which are accessible to all students, contain multiple media equipment, and have workshops or consultations.

Multiplicity: Alternative retellings of a story

Performance: The ability to locate areas to add contributions to a transmedia story.

Photovoice: A field technique which allows a community to select photographs which best represent themselves and their stories.

Project-based learning (PBL): A group project approach that solves community-based problems

Python: A programming language which is popular in data science.

R: A computer statistics program/programming language which can be used to conduct statistical analyses and create charts and figures.

Raw photos: A photo which contains the raw pixel data from a camera without any (or limited) manufacturer processing and compression. Raw photos allow more edits to be made, but the file sizes are much larger.

Seriality: The ability for individual stories to form a full story when viewed together.

Spreadability: The ability for media to circulate through social networks.

Subjectivity: The ability to give different perspectives to a story.

Transmedia: Conveying a message across multiple media platforms, and allowing users to contribute content.

Transmedia storytelling: Telling a story across multiple media platforms, and allowing users to contribute content.

Virtual Reality (VR): An immersive computer-simulated environment/game in which a user can participate in, typically by wearing a special headset which tracks their head movement.

WordPress: A content-management system which allows users to create websites.

Worldbuilding: Pitching a transmedia project by creating a world which can support multiple stories.

1.0 Introduction

Worcester Polytechnic Institute (WPI) is a technical university founded to bridge engineering studies with practical experience, as reflected by its motto "theory and practice". WPI's emphasis on project-based learning teaches students the connection between what they learn in the curriculum, and how they use what they've learned to solve real-world problems. The opportunities for expressing the outcomes of student projects have been shifting from written reports and PowerPoint presentations to more dynamic platforms. To that end, advances in media technology have the potential to enhance the WPI curriculum and shape how students do projects.

In the fall of 2018, the Foisie Innovation Studio was opened with the goal that WPI would focus more on the meaning and impact of our work ("Foisie Innovation Studio", 2018) (Duffy, 2018). The Global Lab brings together project-based learning, digital storytelling, and global engagement as students explore how technology can be used to deepen collaboration and expand their impact (Duffy, 2018). This lab is designed to train users and enable the options for transmedia storytelling principles in projects.

The goal of our project was to facilitate transmedia storytelling as a means to enhance the impact of the IQP at WPI. We met this goal by addressing each of the following objectives:

1. Understand transmedia best practices
2. Identify transmedia resources and capacities at WPI
3. Create and pilot a guide to use transmedia storytelling in WPI projects

The completion of this project provided a guide with examples on how to use the Global Lab to add a transmedia experience to a project, and thus create larger and more immersive projects within the local and global community.

2.0 Background

This chapter provides background on the development of project-based learning (PBL) within the WPI Plan and new opportunities to incorporate transmedia storytelling into academic learning outcomes. Further, we discussed transmedia storytelling, which is a rapidly evolving use of media to enhance the learning experience. We conclude with several case studies to demonstrate the direction that transmedia storytelling can take a project.

2.1 The WPI Plan

Worcester Polytechnic Institute (WPI) adopted a project-based learning approach to its curricula so that students could learn how to engage with stakeholders and context-specific projects. The WPI Plan specifies two required projects for students: a social sciences based project, called the Interactive Qualifying Project (IQP), and a project within a student's major, called the Major Qualifying Project (MQP). These projects set WPI apart from other universities and help ensure that students have the skills and experience required to work in complex settings (Worcester Polytechnic Institute, 2018).

The IQP is a learning experience which asks students to work on a problem at the intersection of science, social, cultural, and humanities domain (R. Vaz, personal communication, October 30, 2018). The learning outcomes of the IQP include demonstrating an understanding of context, maintaining effective team dynamics, demonstrating effective communication, and awareness of the ethical side of their project ("Interactive Qualifying Project", n.d.). The deliverables for this project typically include a written report which specifies the intent, methodology, and findings of the project.

The change in the curriculum started with Harry Storke, WPI's tenth president, who recognized the need to modernize WPI. WPI's curriculum had often been revered as a model of innovation but by 1960 the program had become the same as other engineering schools. President Storke was inspired by the way students were, stating, "[t]oday's student is relatively more active, more informed, more socially conscious and more concerned about the future of mankind than, I think has been the student of any previous generation" (Landry et al., 2015).

Project-based learning is deeply ingrained into the identity at the university. WPI's project-based learning system created in 1970 is celebrated as the WPI miracle (Dorsey, 1996).

The implementation of the projects radicalized not only the use of projects to promote learning, but also led to the removal of degree requirements for WPI majors. The shift mirrored the major social reform happening in the world and even on campus with the first female students and faculty arriving on campus in 1968 (CNN: The Seventies, 2015). WPI's curriculum overhaul changed the course of the institution.

2.2 Project-Based Learning

Project-based learning is an educational strategy that incorporates community-based problem solving within a group dynamic to encourage students to learn past the traditional classroom setting. Traditional teaching required a teacher in front of a classroom explaining the material, which may not be inclusive to all student's learning styles (Mitchell, 2008). Through project-based learning, students can incorporate their own experiences as well as the in-class material into a concept that created a new depth of understanding (Levinson, 1990).

Project-based learning aims to enrich collaboration while offering an authentic experience through engagement with teams on a single outcome (Schunk, 2014). The approach teaches students important skills including team participation, time management, and deadline execution which will help them later as they enter the work field (Bell, 2010). Project-based learning is currently being changed through access to technology which will be the start of the following section.

2.3 Transmedia as a Vehicle for Storytelling

Students now have access to technology which changes the way faculty approach PBL (Mcknight et al., 2016). Faculty and students around the world are exploring the potential for transmedia to significantly alter the classroom experience. For example, some teachers are experimenting with VR/AR, simulations, animation, robotics, and live performances to supplement PBL (Wang, 2018).

For use in PBL, it is important to know how to use media to elicit the response from the audience. Each type of media is best suited for different types of messages (McLuhan, 2003, p. 19). Using this concept, transmedia storytelling expresses different messages across multiple media and incorporates content which is generated by its users through a participatory community (Scolari, 2014, p. 70). Transmedia content is like multimedia but is often more

dispersed and engages its audience by making them search for, participate in, or create content (Jenkins, 2016). Also, unlike multimedia experiences, each medium in transmedia content tells a unique story, which contributes to the overall message. Henry Jenkins, an expert in the field, defines seven principles that are shared by most transmedia content, as listed below in Table 1.

Table 1: The principles of transmedia storytelling (Jenkins, 2009a) (Jenkins, 2009b)

Principle	Description
Spreadability vs. Drillability	Spreadability: "The capacity of the public to engage actively in the circulation of media content through social networks and in the process expand its economic value and cultural worth." Drillability: The ability to drill down into the depths of a story.
Continuity vs. Multiplicity	Continuity: "A 'unified experience' which is 'systematically' developed across multiple texts." Multiplicity: "Alternative retellings, seeing the characters and events from fresh perspectives."
Immersion vs. Extractability	Immersion: "The ability of consumers to enter into fictional worlds." Extractability: "The fan takes aspects of the story away with them as resources they deploy in the spaces of their everyday life."
Worldbuilding	"Constructed interconnecting worlds which link together stories scattered across publications." This becomes the pitch for a story.
Seriality	"Creates meaningful and compelling story chunks and then disperses the full story across multiple installments."
Subjectivity	Giving a different perspective to the story - by developing content on a secondary character, from their point of view.
Performance	Areas where producers and fans can make their own contributions.

Effective applications start with a single idea, which is transformed through the process of world-building to create a platform for the expression of multiple diverse stories (Moloney,

2011b). Producers can build a world by imagining a way for multiple characters and storylines to play out (Jenkins, 2009b). For example, System76, a Linux computer retailer, used the idea of open source computing to build a "warm" and "welcoming" world for their audience which features a futuristic world of robots and space travel (Figure 1) (Hazen, n.d.). After creating the world, the storyteller creates initial content to demonstrate the potential of the world and inspire their community to contribute more content (Jenkins, 2009a). System76 did this by creating campaigns across multiple media which featured fictional characters who promote freedom to innovate (System76, n.d.). These campaigns formed an active community which contributes content to the world and benefits all stakeholders.

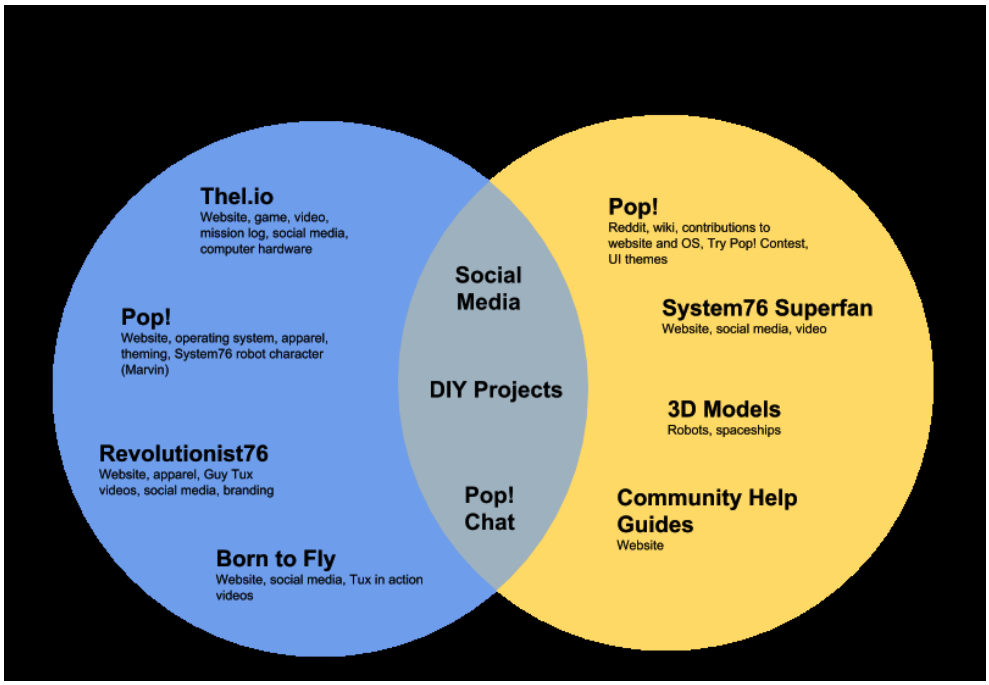


Figure 1: System76, a Linux computer retailer, uses transmedia storytelling to promote freedom of innovation and open source computing.

2.4 Applications for Learning Environments

Transmedia storytelling uses dispersed media to present a message in a nonlinear format, which caters to the way people naturally think (Jenkins et al., 2007). By presenting information in smaller, immersive chunks, it also addresses a documented shift to short attention spans (Kalogeras, 2014). Also, transmedia is inherently accessible because it recreates senses

(especially through AR/VR), provides a story that people can follow and uses multiple media which allow people to experience the ones they can or want to participate in (Thom, 2018). User-contributed content can also improve the accessibility of the story, by adding different media or even captioning images and videos.

Transmedia storytelling fosters a new relationship between producers and their audiences (Guynes et al., 2017). Most notably, the spreadability and performance principles encourage consumers to become producers as well, creating new content which benefits everyone involved (Jenkins, 2009a). Educational environments are good candidates for transmedia storytelling because with the principles of drillability and seriality it can be used to increase student engagement and understanding of academic work as they explore a series of works in depth (Benedict et al., 2013).

In order to better understand the potential for transmedia storytelling, we examined two examples in greater detail. The first case study shows how transmedia storytelling was used in Arizona State University to create a discussion around the ethics of scientific progress. The second shows how transmedia storytelling can be applied to serious training applications through the Army Learning Model.

2.4.1 Case 1. Arizona State University (ASU) and the Frankenstein Bicentennial Project

Arizona State University (ASU) presents its students with many opportunities to apply their classroom learning to real-world projects (Arizona State University, n.d.). ASU received a grant from the National Science Foundation to explore alternative ways of science education; they elected to use transmedia storytelling as a way to make discussions arise naturally (Hackett, 2015).

ASU enabled students to learn about scientific ethics using the principles of transmedia storytelling and the classic Frankenstein novel (Hackett, 2015). ASU hosted the Frankenstein Bicentennial Project which "encompass[ed] a wide variety of public programs, physical and digital exhibits, research projects, scientific demonstrations, competitions, festivals, art projects, formal and informal learning opportunities, and publications exploring the novel's colossal scientific, technological, artistic, cultural and social impacts" (Arizona State University, "Frankenstein Bicentennial Project", n.d.). The Frankenbook project demonstrates a professional use of transmedia storytelling to create collaborative discussions on the content of the original

Frankenstein text by allowing readers to add and respond to comments through an online version of the book (Frankenbook, 2018). Other projects, such as the Frankenstein200 website allow participants to play online games and do hands-on activities about science (see Figure 2).

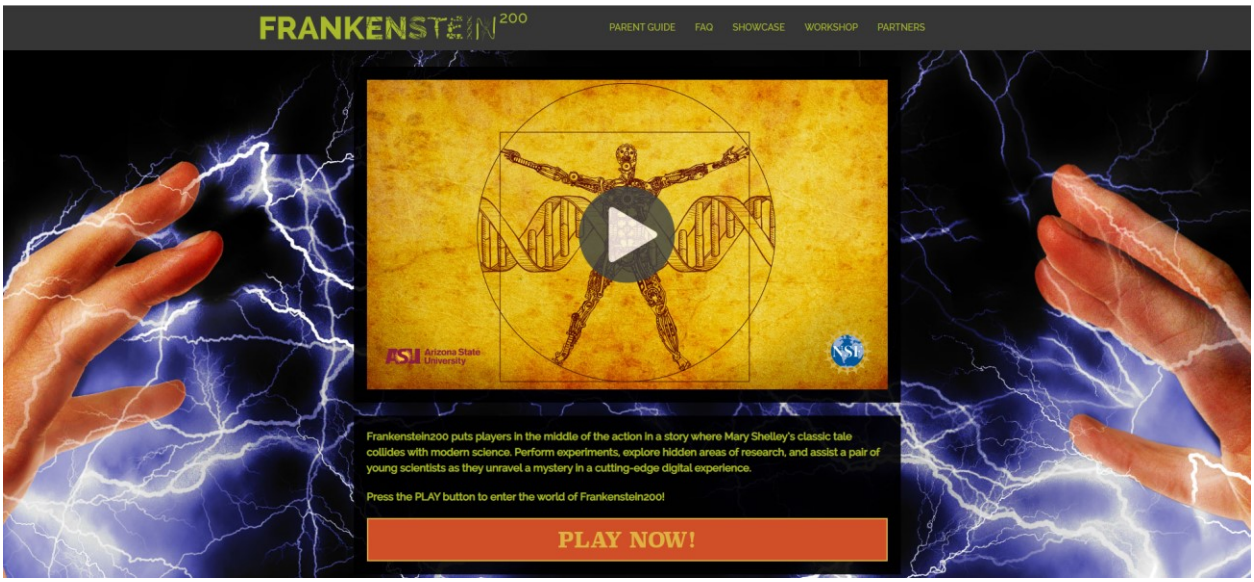


Figure 2: The Frankenstein200 interactive website, sponsored by the NSF and ASU (Arizona State University, "Frankenstein200", n.d.).

This case study demonstrates how participatory transmedia can be incorporated into an academic environment. The transmedia principle of spreadability vs. drillability are clearly demonstrated in this example and help "inspire deeper conversations about scientific and technological creativity and social responsibility" (Arizona State University, "Frankenstein200", n.d.).

2.4.2 Case 2. Army Learning Model (ALM)

The United States Army created the Army Learning Model (ALM) in 2011 to allow for "anytime, anywhere training" (Raybourn, 2014). The ALM allows soldiers to immerse themselves in a personalized training experience using concepts of multi-media deployment and storytelling such as film, text, radio, teaching opportunities and social media (Poulten, 2015). For example, a soldier may do activities about cultural awareness through an augmented reality game, then write a blog post about it, and finally continue the conversation through social media

(Raybourn, 2014). Soldiers will also get experience during simulated field training exercises in virtual environments which will make them prepared in a real situation (Stafford, 2012).

By using transmedia storytelling, the ALM has influenced the way soldiers are learning and developing (Stafford, 2012). This case study demonstrates effective use of the transmedia principles of immersion and extractability as soldiers are able to immerse themselves in simulations (virtual reality and games) and extract skills which they will apply to their time serving in the Army. The ALM also demonstrates spreadability, through its various media platforms (including social networks) and teaching opportunities.

These case studies show how transmedia storytelling can be used to enhance education. Students can create more engaging projects by using the principles of transmedia storytelling. Faculty can also use these concepts to design projects that will lend themselves to transmedia, such as using worldbuilding to support multiple stories (such as the Frankenstein Bicentennial Project). Based on these case studies, WPI's IQP could incorporate principles of transmedia such as spreadability, worldbuilding, immersion, and extractability to create a more impactful experience.

2.5 Summary

In sum, the literature review demonstrates the potential of transmedia storytelling to change the educational strategies within academic projects. The project-based learning curriculum at WPI has revolutionized the approach students take to addressing problems that arise in their communities. The current change in technological platforms available to spread messages and experience new depths of learning has called for a new shift to the project-based learning. The concept of transmedia storytelling lends itself to be integrated into the IQP experience by enabling students to amplify the project experience and further the visibility of their work. The creation of the IQP emerged from radical change to the WPI curriculum,and transmedia can revolutionize the expression of student work at the Foisie Innovation Studio Global Media Lab.

3.0 Methodology

This chapter outlines the methods that we used to complete our project. The goal of our project was to facilitate transmedia storytelling as a means to enhance the impact of the IQP at WPI. We met this goal by addressing each of the following objectives:

4. Understand best practices in transmedia storytelling
5. Identify transmedia resources and capacities at WPI
6. Create and pilot a guide to use transmedia storytelling in WPI projects

These objectives were accomplished through the combination of semi-standardized and unstructured interviews of experts, faculty, staff and students, research, and user testing, which is summarized below in Figure 3.

Figure 3: Outline of objectives

We discussed each of these objectives and their associated tasks in depth in the following sections.

3.1 Objective 1: Understand Best Practices in Transmedia Storytelling

Our first objective compiled available information on the present implementation of transmedia storytelling into academic learning. The research consisted of profiling institutions, in the table below, that have indicated an implementation of transmedia. The institutions' use of transmedia included scenarios in Ph.D. programs, media labs, interdisciplinary project inclusion, and subsets of the colleges dedicated to media. Each university was treated as a case study with the intent of understanding one specific use of transmedia storytelling at each school.

We interviewed experts that we found through a literature review of transmedia storytelling. A semi-standardized interview strategy was with the experts to better understand best practices in transmedia storytelling and how we could apply them to WPI projects. Interview questions can be found in Appendix A and B, and a table summarizing a small sample of contacts offering institutional support for transmedia options is pictured below (See table 2).

3.1.1 Research about Institutions

Table 2: Sample of relevant institutions

Institution	Information Gathered
Arizona State University (ASU)	• How to transform a book into a transmedia storytelling experience • Frankenstein Bicentennial Project
Ball State University (BSU)	• What the course based on transmedia storytelling is like
Boston College (BC)	• How virtual reality was used within the Joycestick project • How to collect student perspectives of these projects
Harvard College	• What the potential of the XMedia Lab is
Massachusetts Institute of Technology (MIT)	• How multiple departments come together to develop a transmedia experience.
University of Colorado Boulder (UCB)	• How and why UCB created a college based on media.
University of Southern California (USC)	• What media technologies does the Annenberg Media Lab use to enhance project collaboration.

3.1.2 Interviews with Experts

The experts that we have identified and were able to interview are Henry Jenkins and Kevin Moloney. Both have conducted influential research that has helped guide transmedia storytelling within academics.

Henry Jenkins

Henry Jenkins is considered an expert in transmedia storytelling and has written several books on the use of transmedia within academics. He currently resides at USC and has continued being a professor in the field of transmedia. We asked for his input on transmedia storytelling within academics and the IQP.

Kevin Moloney

Kevin Moloney is an expert of transmedia storytelling and its application to journalism. We interviewed him to learn about BSU's IQP-like projects and how we can incorporate transmedia storytelling into our projects. He offered ideas on how courses can build the foundation for understanding transmedia storytelling and therefore incorporating transmedia into projects.

3.2 Objective 2: Identify Transmedia Resources and Capacities at WPI

To provide an understanding of the resources and capacities of transmedia storytelling at WPI, we collected information from WPI's websites, interviews with members of the WPI community, and participation in Global Lab training sessions. We identified media which was relevant to the IQP, and through the use of online directories, we detailed the locations and resources which could be used to create them. To identify faculty, we used snowball sampling techniques by starting with a few faculty members that we identified as using transmedia principles in IQPs and asking them who else we should interview (Berg, 2007). Prior to each interview, we reviewed the work that their students completed on IQP by finding recent projects on WPI's DigitalCommons to understand the extent of media usage.

3.2.1 Interviews with Faculty Members at WPI

We identified the following list of professors as having experience with alternative formats for IQPs and interviewed them to gather information on the reasoning behind their changes to the IQP, their students' reaction to the new formats, and their thoughts on incorporating transmedia storytelling within major projects at WPI. We asked these professors to give us recommendations for other faculty members to interview. See a full list of faculty interviews in Appendix C.

Table 3: Sample of relevant WPI faculty contacts.

Faculty Member	Department
Leslie Dodson	Humanities and Arts / Global Lab
Stephen McCauley	Interdisciplinary and Global Studies (IGSD)
Ingrid Shockey	IGSD / Environmental & Sustainability Studies
Robert Hersh	IGSD
Fabio Carrera	IGSD
Lorraine Higgins	Humanities and Arts
Katherine Foo	IGSD
Scott Jiusto	IGSD
Lane Harrison	Computer Science
Charlie Roberts	Computer Science / Interactive Media and Game Development (IMGD)

3.2.2 Interviews with Administrative Offices and Divisions

To understand how changes to the IQP would affect the administrative offices and divisions at WPI, we conducted interviews with faculty and staff with goals outlined in Table 4.

Table 4: Sample of relevant administrative offices and divisions.

Office/Division	Information Gathered
Division of Marketing Communications	• How they create public websites for IQPs • How WPI markets the IQP
Office of Undergraduate Admissions	• How prospective students find out about IQPs • How prospective students engage with existing IQP projects
Interdisciplinary and Global Studies Division (IGSD)	• What options are there for IQP deliverables • How IQPs can include transmedia
Gordon Library - Curation, Preservation, and Archives (Archives)	• What are the best practices in media formats for archiving • How the library will handle transmedia projects
The Global Lab	• What is the potential of the Global Lab to help IQP groups • What resources are provided
Center for Project Based Learning	• What is the history of WPI projects • How IQPs are changing
Academic Technology Center	• What equipment is available for student use • What resources are provided

The questions for all interviews with staff members of WPI offices and divisions can be found in Appendix D.

3.2.3 Participation in Global Lab training sessions

In order to better understand how students can use the Global Lab's resources we participated in their basic and advanced user training sessions. The user training sessions demonstrated the lab's capacity to teach students how to use media creation tools.

3.2.4 Comparative case studies

We used institutional research from Objective 1 to understand how other universities are using media labs, which we applied to the Global Media Lab to identify how it can reach its full potential. We gathered the following information from each lab:

1. Projects created
    a. Transmedia storytelling projects
    b. Community engagement projects
    c. Interdepartmental projects
2. Intended audience
3. Equipment provided/available?
4. The goal of the lab

This information helped us understand the capacity of the Global Lab and identify the aspects or services which under-utilized.

3.3 Objective 3: Create and Pilot a User Guide

In order to understand user needs, we interacted with project teams that used media within their projects to understand if the guide would have been helpful. We combined these results with the information from the previous two objectives into a rubric that identified:

1. common student and faculty needs, ideas, interests, requirements;
2. available experts, on-campus trainings, existing resources;
3. gaps/missing resources and;
4. media file formats.

This rubric was used to inform and design a guidebook that can enable students to choose relevant transmedia options for use in the presentation of IQP data.

We additionally collaborated with user testing groups to understand which parts of the guideline were useful and what was missing. After the input of the groups was analyzed, we adjusted the guidebook accordingly. Finally, a draft of the guidebook was piloted to teams in ID2050. These student teams used the guide to consider using transmedia storytelling principles into their IQP. We used feedback from the pilot test users to ensure that our guide was easy to use, helpful, and interesting

4.0 Results and Discussion

4.1 Results

In this chapter, we outline the results of our objectives and discuss the overall patterns we found throughout the research. Our research on best practices in transmedia storytelling revealed that other institutions are using it in an academic setting. Experts in transmedia gave us details on how to incorporate it into the IQP at WPI. To determine how students could create transmedia content on campus, we identified resources on campus and evaluated their transmedia capacity. Finally, we compiled the information from Objective 1 and 2 with evaluations of online guides to develop a plan for our guidebook.

4.1.1 Objective 1: Best Practices in Transmedia Storytelling

This objective found and documented best practices in transmedia storytelling in higher educational settings. Our key findings from each of seven profiled institutions are listed in Table 5, below. The institutions varied in their approaches to transmedia storytelling as some implemented media labs, transmedia programs, colleges dedicated to media and interdepartmental collaborations that reflect transmedia storytelling. The details of each approach is below. The two most important findings from the institutions and experts were that transmedia storytelling is being successfully applied to academic fields (see table 5) and that it has the potential to greatly enhance the impact of projects.

Table 5: Institutional practices with Transmedia Storytelling

Institutions	Partners	Goal	Transmedia Storytelling Practice
Arizona State University (ASU)	*50 science museums across the United States* *Science and Society Department at ASU*	Explain science ethics to 10-14 year olds through a well known book	• Frankenstein Bicentennial celebration • Website creation, artists, videos • Included a museum display as well as an online version
Boston College	*English Department* *Computer Science Department*	Explore digital humanities to guide students through the book Ulysses by James Joyce	• Ulysses Joycestick • Created an interactive design and VR to help students understand the book
Harvard University	*US-China Youth Education Solutions (YES) Foundation* *Harvard Graduate School of Education*	Collaborate with the entertainment industry to incorporate educational movies into K-12 education	• xMedia Lab • Challenged to increase the amount of interest in learning by creating more interesting approaches to teaching
Massachusetts Institute of Technology (MIT)	*MIT Media Lab* *CS and AI Lab* *Department of Brain and Cognitive Sciences MIT Sloan School of Management*	Address problems such as climate change and machine learning	• MIT Center for Collective Intelligence • Used human and computer power to create a higher form of intelligence than either computers or humans can achieve alone

Table 5: Institutional practices with Transmedia Storytelling (continued)

University of Colorado Boulder	*NEST Studio for the Arts* *Media Archaeology Lab* *CU News Corps* *Center for Media, Religion and Culture* *Center for Environmental Journalism* *Center for Communication and Democratic Engagement*	Enhance the ways people communicate, the tools they use to do it and the impact that change has on society.	• College of Media, Communication and Information • The college is intended to provide an education well versed in the various media concepts.
University of Southern California (USC)	*Media Lab*	Create a collaborative space to address complex problems and opportunities at the dynamic intersections of media, technology, culture, and society.	• Annenberg Inclusion Initiative • Think & Do Tank that allowed students to incorporate technical aspects into projects

Global Media Labs

The review of the programs showed that Harvard, UCB, USC, and WPI each have their own version of a media lab. Figure 4 below has a sample of the media available in the XMedia Lab at Harvard. The labs at each school had different overall purposes but a major component of each was to give students a space to explore and understand media. The media labs offered students the equipment to create their own media that they could use for class projects or to develop a broader project in the context of their study.

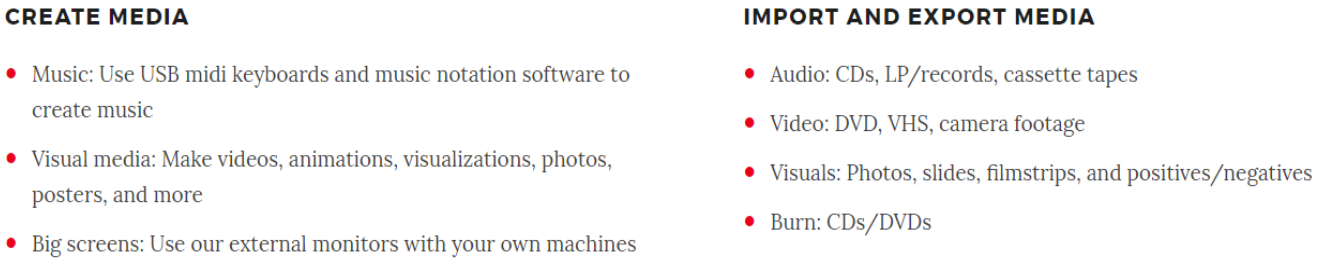


Figure 4: Available Media in Harvard University's XMedia Lab (Harvard Library, n.d.)

Famous Novel Plots Used as Basis for Transmedia Storytelling Projects

Boston College and ASU both had created entire transmedia storytelling experiences through the use of two famous books. The Frankenbook, figure 5, are part of the experience created by ASU. The departments that created the media experiences used the basis that everyone had some sort of understanding of the books and could use that understanding to learn a new topic. Figure 6 is part of Boston College's use of Ulysses in a virtual reality game. Both experiences involved a wide range of contributions from students to the public to the person's own view of the books. The books provided a foundation to build from instead of developing a new idea from no starting basis.

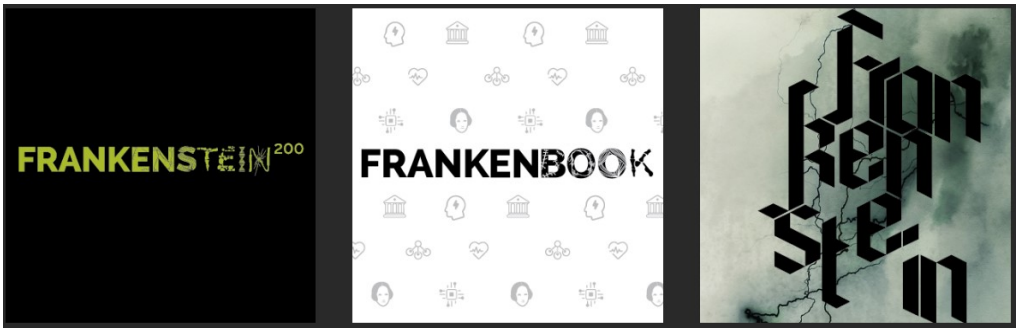


Figure 5: Frankenstein Design on ASU Website ("Frankenbook", n.d.)

Figure 6: Virtual Animation from Boston College's Ulysses Joycestick (Smith, 2017)

Creation of entire majors/colleges dedicated to media

USC and UCB have new additions to their school that include entire parts of the university dedicated to the creation and development of media. MIT and Harvard also have classes dedicated to transmedia storytelling that offer a hands-on experience to create a basis that can be used to develop other classes. The creation of structured classes and majors regarding transmedia storytelling is an emerging interest at both universities.

The interviews with transmedia experts revealed that they employ a variety of approaches for using transmedia storytelling to guide their field of work. For example, Dr. Kevin Moloney,

Professor at Ball State University, works with a graduate program, Emerging Media Design and Development, and teaches transmedia storytelling at the academic level. Moloney is a practiced transmedia expert who has built a career on the influence of media and the significance of transmedia storytelling. One of the tools Moloney uses to teach transmedia storytelling is the Transmedia Bible, which shows students how to incorporate transmedia storytelling within a project. The movement of transmedia storytelling within the academic scene is developing rapidly and Moloney has helped guide the beginning stages.

Similarly, Dr. Henry Jenkins is the Provost Professor of Communication, Journalism, Cinematic Arts and Education at the University of Southern California. Jenkins worked on defining transmedia storytelling through most of his professional career developing material to streamline the introduction of transmedia storytelling within the academic setting. Jenkins provided direction on additional research on the seven transmedia storytelling principles. He also offered a syllabus on a class that focuses on transmedia studies. His work on the seven principles of transmedia education helped create our guide.

Dr. Lane Harrison is a Professor of Computer Science at Worcester Polytechnic Institute who specializes in data visualization. Harrison stated that data visualization in IQPs and MQPs have the potential for improvement. Harrison stated that the "defaults don't fall in line with best practices" in data visualization tools such as Excel. Harrison suggests that the best way to learn about data visualization is to follow experts on social media to increase exposure to material that reflects best practices. He also recommended having workshops and classes focused on the effective use of data visualization with topics such as data journalism. The most important part is to consider the audience and to create visuals that present data in a format that is accessible.

Bob Beard is a Communication and Public Engagement Strategists at Arizona State University where he worked on the creation of the Frankenstein Bicentennial Project in collaboration with faculty, students and artists. The project was both a celebration and a research facet where the academic goal was to educate 10-14 year olds on science ethics using transmedia storytelling. The ASU project team worked with a transmedia studio to integrate media as a core part of science education. Beard sees that people must first be trained to use transmedia storytelling in order to expand the current level of integration it has within academics.

Donal Boyd is a professional photographer and works closely with multiple wildlife sanctuaries. Boyd has been featured in national geographic for his photography that creates

immersive stories of both wildlife and animals. Boyd is a graduate from WPI and suggested the use of hashtags in the social media channels of the WPI classes to showcase project sites would allow students to share their IQP experience with pictures. Another suggestion he gave was to have students take up to 20 photos at their IQP site and create a collage representing the most important parts of their project.

4.1.2 Objective 2: WPI Resources and Capacities

Objective 2 identified resources such as facilities, tools, and training opportunities on campus that students could use to create transmedia content, which included the identification of media hubs. To identify the capacity of WPI to incorporate transmedia storytelling into IQPs we conducted interviews with seven faculty members who had experimented with different ideas for IQP deliverables and five WPI divisions and offices which are connected to IQPs. We also participated in training sessions at the Global Lab and Shuster Lab to experience first-hand what students could learn.

Resources at WPI

When cataloging the resources on campus, we identified several locations which we called “media hubs”. The criteria for what we would consider a media hub were locations on campus that were 1) accessible to all WPI students 2) provided access to multiple media tools 3) provided training or consultations. The hubs that we identified were the Global Lab, Gordon Library, and the Academic Technology Center, which are plotted on the map below in Figure 7.

Figure 7: The locations of the primary media hubs at WPI. (created using GIMP).

The Global Lab was identified as a media hub because of its large amount of equipment, software, and media training opportunities. During the first semester of 2018, about 20% of students doing their IQP used the resources of the Global Lab (Stephen McCauley, December 3, 2018). It has two video cameras, adjustable lighting, a green screen, stand microphones, multiple workstation computers, and VR equipment. As for software, it offers the Adobe Creative Cloud suite, which can be used for a variety of media-related editing tasks. The Lab offers basic training, which teaches students how to properly handle the equipment, as well as more advanced trainings which are based on a specific skill that can be taught in a 40 minute to an hour session. We participated in all available training sessions at the time of our project, though they are still expanding their offerings. The Global Lab also offers media storytelling consultations for project groups. The Global Lab can also conduct training sessions at project centers, as was done by a group of Media Lab faculty, who assisted with the training of a team in Iceland (personal communication, Ingrid Shockey, December 5, 2018). Figure 8 shows the equipment provided by the Global Media Lab as well as us participating in the training sessions.

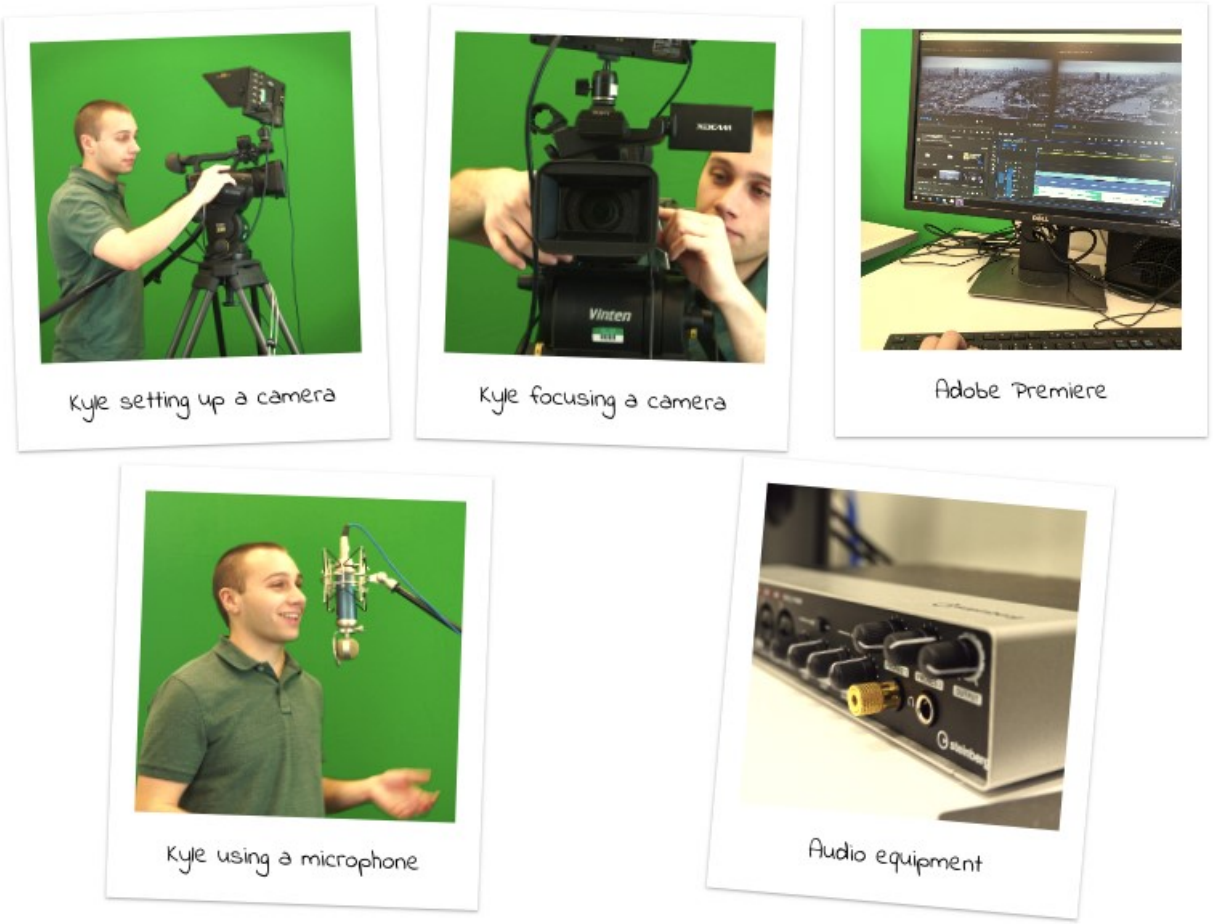


Figure 8: Photos of our team exploring the resources of the Global Media Lab (borders created using HTML and CSS).

The second media hub we identified was Gordon Library, which has lab spaces focused on digital scholarship and multimedia development, called the Shuster Lab for Digital Scholarship and the Multimedia Lab. Both labs contain computers with the capability to handle graphics-intensive software. The Shuster Lab also contains a graphics and art scanner, which can be used to digitize artwork. The Multimedia Lab has a color printer available for students to use as well. In terms of software, the computers in both rooms come with graphing, mapping, and text mining software and the Shuster Lab computers have Adobe Creative Cloud installed. Workshops are taught in the Shuster Lab on mapping, text mining, and digital exhibits, with the potential of more topics in the future. The library also publishes a digital scholarship guide through their LibGuides platform, where students can find resources on various media-related

topics. The staff at the Gordon Library also provide consultations on developing digital projects and run workshops in digital scholarship tools and methods, as seen in figure 9 below.

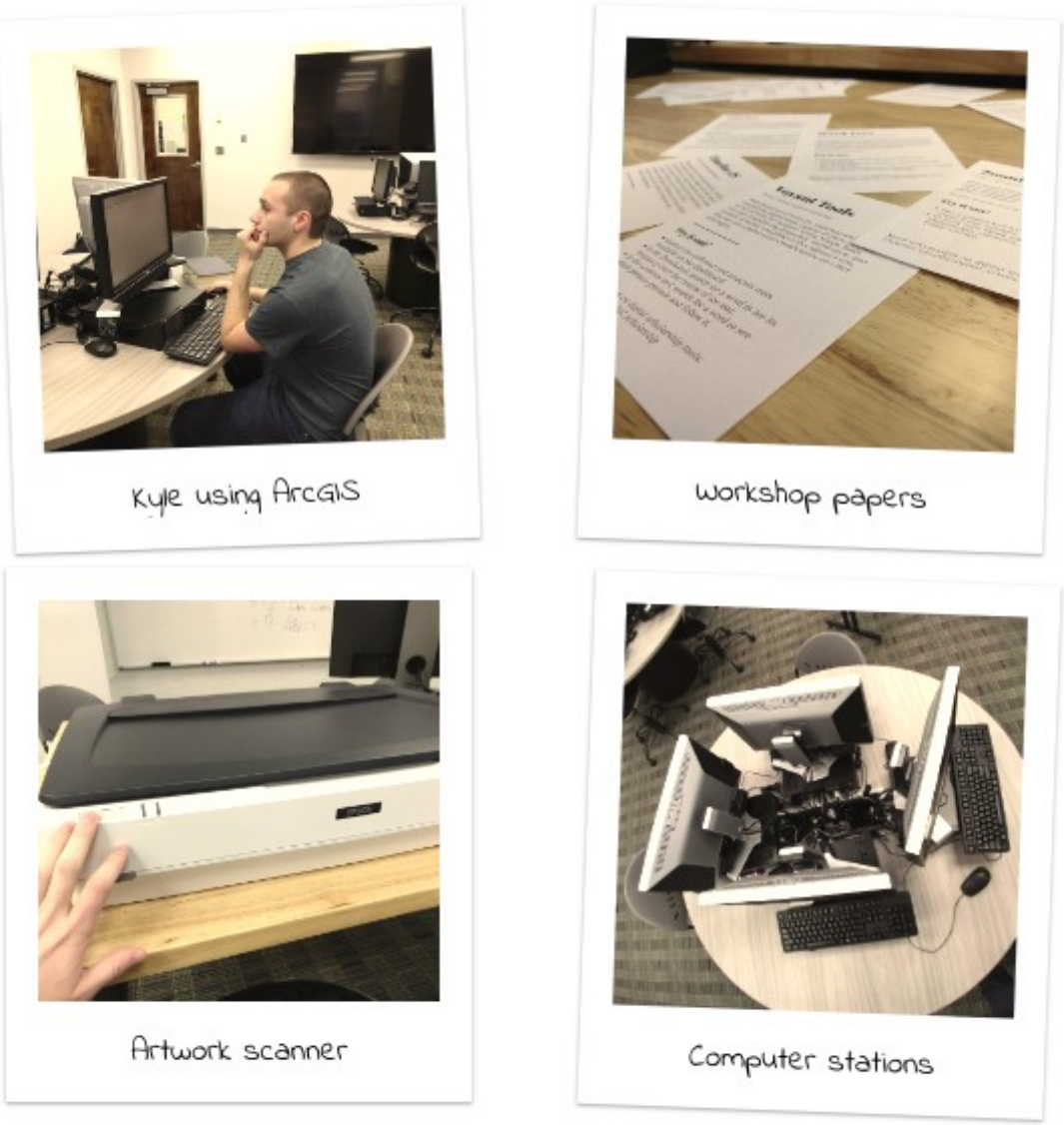


Figure 9: Photos of our team exploring the Shuster Lab in Gordon Library (borders created using HTML and CSS).

Finally, we identified the Academic Technology Center (figure 10) as one of the primary hubs where students can borrow field equipment. The ATC offers digital cameras (video and still), tripods, digital audio recorders, lavalier microphones (for on-campus use only), and poster printers. The ATC also offers consultations on what equipment to use for a given project and

have guides on how to create a high-quality poster. Laptops can also be signed out for off-campus IQPs with the approval of IGSD, and Adobe Creative Cloud can be installed on them.

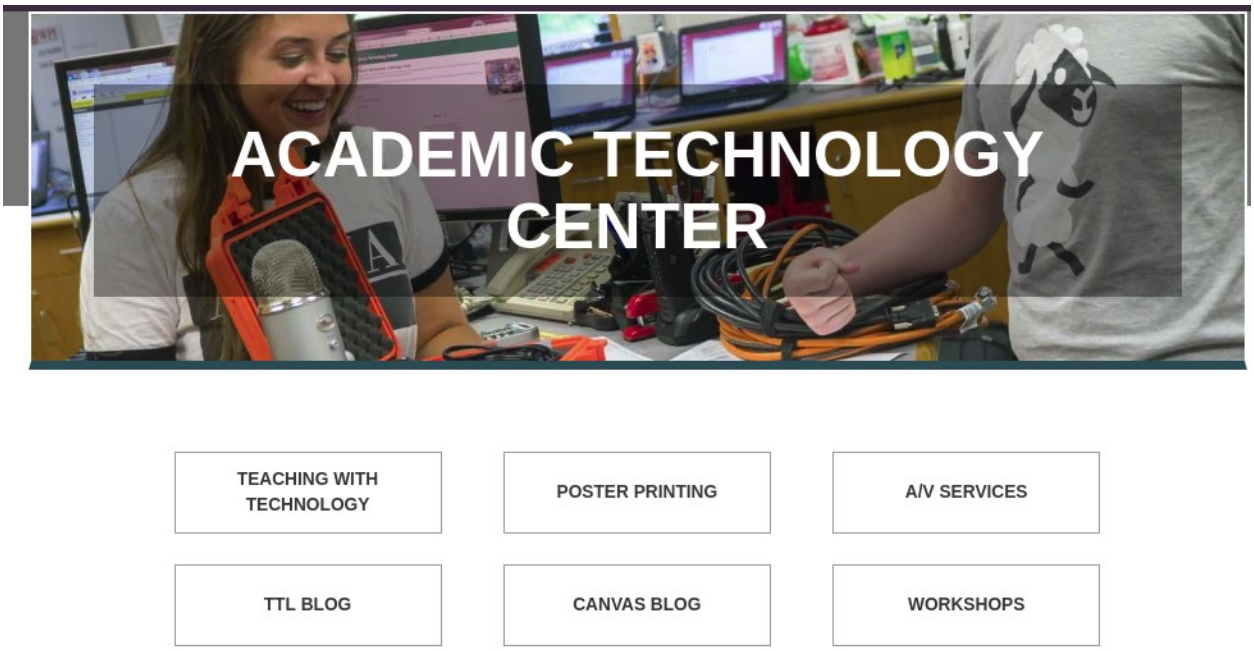


Figure 10: The website for the ATC ("Academic Technology Center", n.d.)

An overview of media tools, trainings, and resources available on campus are summarized in Table 6 below.

Table 6: The tools and training provided by WPI to create media.

Tool	Facilities	Training

Video camera	• ATC
	• Global Lab
		• Global Lab
		  ○ Basic User Training
		  ○ Video Editing and Post Processing
		  ○ Advanced Video Editing and Green Screen
		  ○ Techniques in Field Methods

Digital still camera	• ATC	• Global Lab ○ Techniques in Field Methods • Photography Club (club)

Digital audio recorder	• ATC
	• Global Lab
		• Global Lab
		  ○ Podcasts and Audio Techniques
		  ○ Techniques in Field Methods
		• Wireless Association (club)
		• WWPI Campus Radio (club)

Lavaliere Microphone	• ATC • Foisie Front Desk	• Global Lab ○ Techniques in Field Methods

Adobe Creative Suite (video, photo, graphic, and audio software)	• Global Lab
	• Shuster Lab
	• HL 230
	• Fuller Labs computers
	• SL 123
	• Laptops from ATC
		• Global Lab
		  ○ Video Editing and Post Processing
		  ○ Podcasts and Audio Techniques

WordPress (website software)	• Any computer	• WordPress tutorials
Microsoft Publisher (report software)	• Any computer	• Peddler (school newspaper club) ○ Experience with document design
Digital document/art scanner	• Shuster Lab	• Shuster Lab
Social Media	• Any computer	• Shuster Lab
ArcGIS (mapping software)	• Any lab computer	• Shuster Lab ○ Mapping Fundamentals

Table 6: The tools and training provided by WPI to create media (continued)

Unity (VR/game development software)	• Zoo Lab • IMGD Lab	• Game Development Club (club) • IMGD department
Poster printer	• ATC	• ATC ○ Poster printing guide
VR Headset	• Global Lab	• Global Lab ○ In development
Audacity (audio software)	• Any computer	•
R with ggplot2 (graphing/statistics software)	• Any computer	• MA 2611, MA 2612
Voyant, Word Trees, Google Ngrams (text mining software)	• Any computer	• Shuster Lab ○ Text Mining & Analysis
MATLAB (graphing/statistics software)	• Any computer	• Scientific/Engineering Software Applications (SESA) ○ MATLAB Lectures

These tools can help students develop media for their IQP or other projects, and all are available for free on campus. Recommended software alternatives that are not available through WPI directly are listed in the Supplemental Findings section below.

The Capacity of Faculty to Administer Transmedia Storytelling

For the second part of Objective 2, we identified the capacity of WPI to incorporate transmedia storytelling into IQPs. We interviewed faculty members with experience in alternative IQP formats to get an understanding of the current capacity of administering transmedia IQPs. Overall, the faculty members interviewed were able to have students incorporate multimedia, into IQPs without any major issues, though it was more difficult than a standard project. Several faculty were hesitant to say that the IQP should change, citing concerns about standardized grading, lack of media training for faculty, and the needs of certain sponsors.

Our interviewees were identified through snowball sampling techniques and most had assigned booklet or website format reports; they reported that students enjoyed these more creative projects. Of the interviewees, 71% recommended that project teams should have a

website and many believed that students should tell a story through visuals and text. For example, Professor Scott Jiusto had students journal their experiences using reflective stories and photos for publishing on a website, which helped guide the students' projects (Scott Jiusto, November 19, 2018). We also asked our interviewees for ways to enhance the IQP and the majority recommended websites, booklets, and photographs. They believed that incorporating these media into projects would enhance their message and accessibility. Other popular recommendations were videos and audio, which had three and two recommendations respectively. Maps, data visualization, and AR/VR were also brought up in interviews as potential media to include.

The Capacity of WPI to Archive Transmedia Content

The media available for use in IQPs is limited to what the Gordon Library can archive if the projects are intended to be viewed after their completion. Gordon Library Archives has the capacity to archive most media in their native formats, though they recommend using certain file formats, documented in Appendix G. Figure 11 shows which media could be archived at the time of this report, where blue represents a medium being archivable in its native format, red represents the inability to archive, and yellow represents a medium being archivable as a different medium. Media which can only be archived using another medium, such as CAD files - which need to be converted to an image, may lose some data/features in the process. In our interview with Arthur Carlson, the Assistant Director of Archives, he said that Gordon Library was currently developing a new system which would drastically increase the list of archivable formats (Arthur Carlson, December 7, 2018).

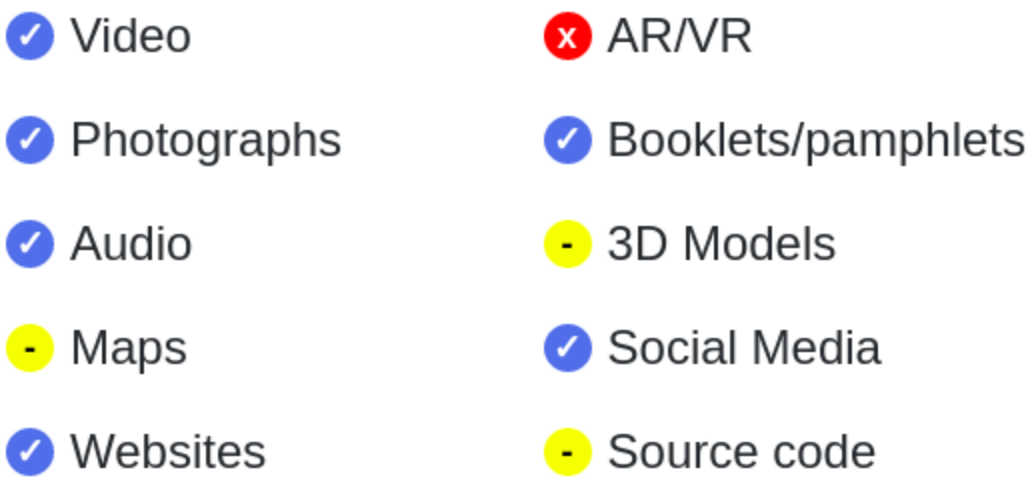


Figure 11: Gordon Library Archives' ability to archive media (created using HTML and CSS).

The Capacity of WPI to Display Transmedia Projects

Our interviews also revealed that many offices have the capacity to use IQPs with transmedia storytelling elements. The IQP is also used to promote the image of WPI to prospective students, employers, and sponsors/donors, so any changes to the IQP format will impact offices such as the Division of Marketing Communications and the Office of Undergraduate Admissions. The Division of Marketing Communications uses IQPs to promote WPI to prospective students and their parents. It launched an initiative to document the entire IQP process using photographs and videos so they can convey a better sense of what the whole experience is like. Marketing is also exploring the possibility of adding 360-degree photo and video support to Drupal, the software used for WPI's website. Marketing also supports the creation of WordPress websites for IQP groups, which allow for easy modification of web-content and student-run blogs.

The Office of Undergraduate Admissions also uses IQPs to enhance the appeal of WPI to prospective students. Currently, they have the capacity to show photographs and videos for on-campus tours through presentations and the multiple screens present within buildings on campus. They also utilize social media to share web-based content related to IQPs. Undergraduate Admissions expressed an interest in having more IQPs with media-rich content such as photos, videos, websites, and social media.

Our interview with the director of the Center for Project Based Learning, Rick Vaz, revealed that WPI provides assistance to other institutions looking to incorporate project-based learning into their curriculums. The IQP is one of WPI's main implementations of project-based learning, and therefore the Center for PBL spends a lot of time discussing the IQP and its impact. Vaz stated that there has been an increase in media-rich projects over the last few years, and he believes that transmedia storytelling would be beneficial to the IQP.

Other administration on campus, such as IGSD and the Global Lab are actively promoting the use of media within IQPs and offer workshops for both faculty and students. These groups help disseminate the results of the IQPs to people who need it, such as the sponsors and researchers. By using transmedia storytelling, they believe students will be able to amplify the expression of their data and make these projects more accessible to interested parties. IGSD is in charge of the administration of the IQP, and have worked with the other offices mentioned above to promote this project.

4.1.3 Objective 3: Transmedia Storytelling User Guide

To complete Objective 3, we consolidated research from Objectives 1 and 2 to form guidelines for a guide website on transmedia storytelling in IQPs. The guidelines outlined what content the guide would need to contain, such as media tutorials and resources, transmedia principles, and file formats. By conducting interviews of faculty members and offices at WPI, we were able to identify the types of media which would be useful for students to include in their projects. We also discovered the best practices for web-based guide user experience by looking at successful and popular online guides.

Through the first two objectives, we have collected recommendations that should be in the transmedia storytelling guide. Our guide will feature tutorials on how to effectively use media within IQPs, covering topics such as best practices, resources on campus, and file formats to use. The media that the guide will focus on can be found in Figure 12, with the size relating to its important/number of recommendations, which were gathered from input during our interviews on how the IQP could be enhanced through media. An explanation of transmedia storytelling principles will be included to show the relation to the IQP. The principles will also explain a gap in the varieties of media that can be created and the perceived understanding of the media to people who view the project.

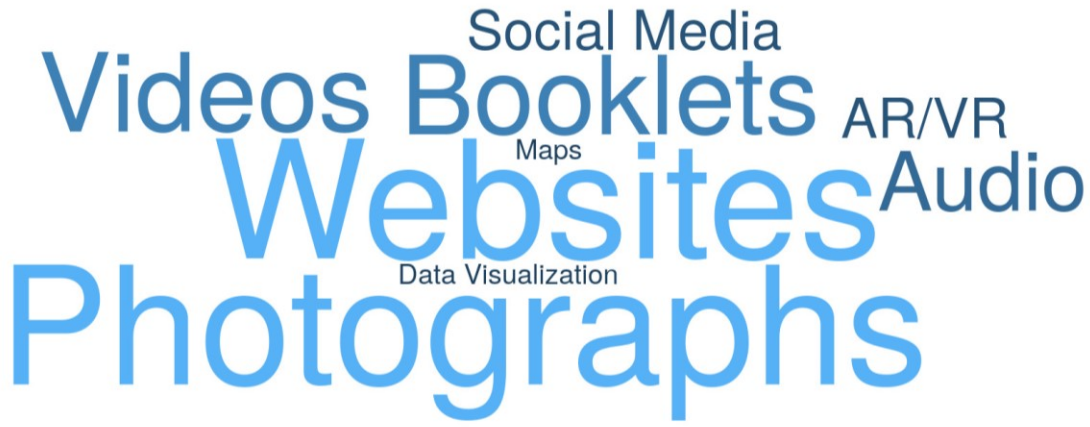


Figure 12: A word cloud of the recommended media by our interviewees (created using R and ggplot2).

Our team analyzed several online guides to identify best practices in usability and chose which to look at based on their popularity, familiarity, and relevance to media practices. A common practice among the guides was having all topics clearly visible on the main page, thus making it easy to add a link to another page which could be found. Some other relevant practices in the guides that we identified as useful are: search, frequently asked questions/popular pages, supplemental images and videos, and a downloadable PDF version. A complete listing of the pros and cons of each online guide can be found in Table 7 below.

Table 7: The pros and cons of popular web-based guides.

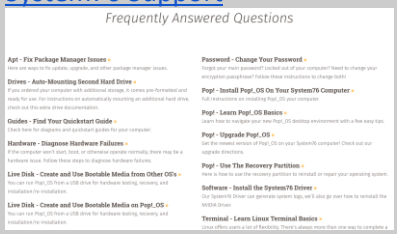
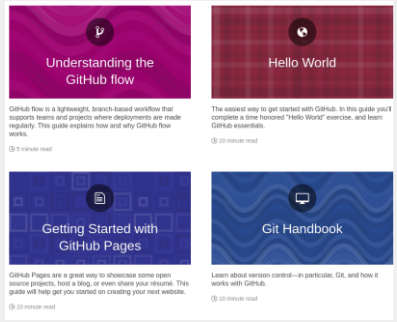
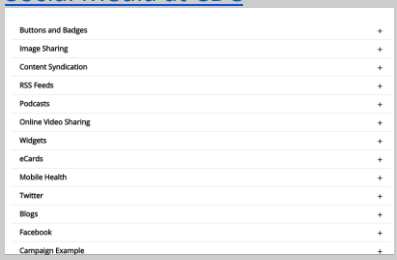
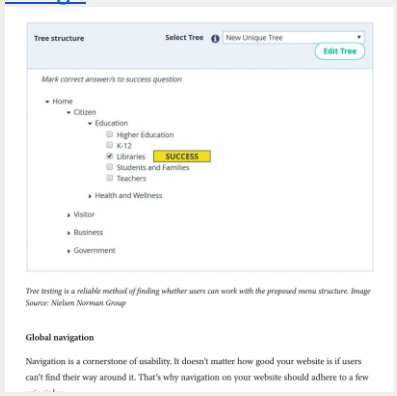
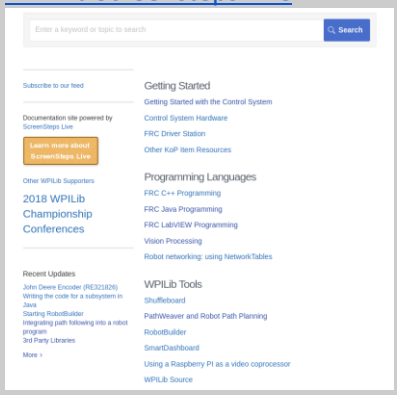
Guide	Pros	Cons
Open Source Guides 	• Easy to add a link to another page • Easy to find guide topic • All guide topics clearly visible	• No search
Material Design 	• Search • Lots of guide topics • Sidebar navigation • What's new section	• Cluttered homepage
System76 Support 	• FAQs • All guide topics clearly visible • Community added guides • Guide titles start with the category	• No search • Many articles aren't categorized into their sections • Have to scroll to see any guides
GitHub Guides 	• All guide topics clearly visible • Video guides • Read time	• Some titles are vague • No search

Table 7: The pros and cons of popular web-based guides (continued).

Social Media at CDC 	• Categorization • PDF guide • Extra resources links • Lists best media practices • All guide topics clearly visible	• Lengthy text • No search
A Comprehensive Guide to Web Design 	• Detailed with examples • Supplemental images	• Lengthy • No categorization (all one page) • No search
WPILib Screensteps Live 	• Categorization • PDF guide • All guide topics clearly visible • Subpages for categories • Search • Supplemental images	

Based on our analysis of online guides, we developed a mockup of our guide, seen in Figure 13, using a WordPress theme from Marketing. The guide will use categories to organize the content and have visual thumbnails for each topic. The flowchart in Figure 14 shows how a student would interact with our guide website to find information. We received feedback on this design from WPI Professor Lane Harrison, who noted that this design is usable unless there becomes a large number of guide topics, in which case a multi-column, text-only approach may be necessary. He also noted that it is important to be able to access most of the content from the

first page, as many people will not find content which is only accessible by navigating through several pages.

To create a transmedia storytelling project, students will need to complete the following checklist of activities, which were identified through research on storytelling (Pratten, 2015).

1. Identify the goal of the project
2. Identify the audience of the project's deliverables
3. Identify deliverable limitations which may restrict certain forms of media
4. Write a narrative for the project, using the principles of transmedia storytelling to guide decisions
5. Use the transmedia guide to find media resources on campus (figure 14)

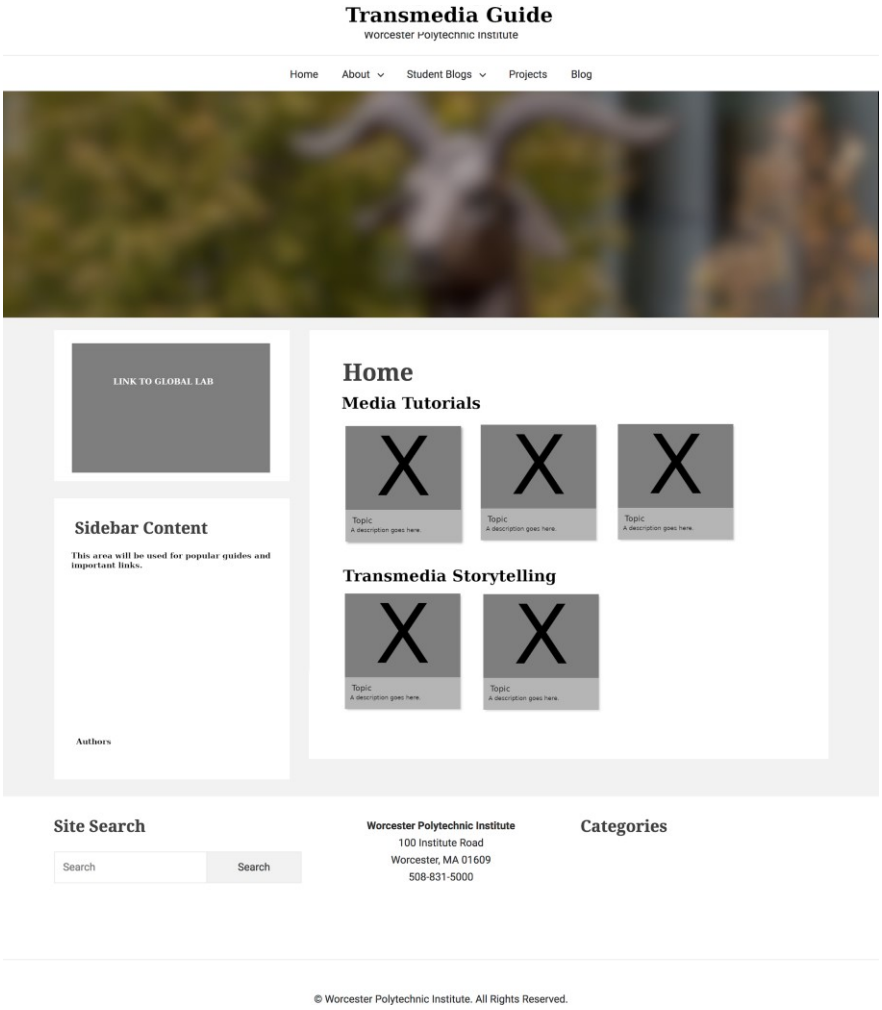


Figure 13: A mockup of the guide. Created using GIMP.

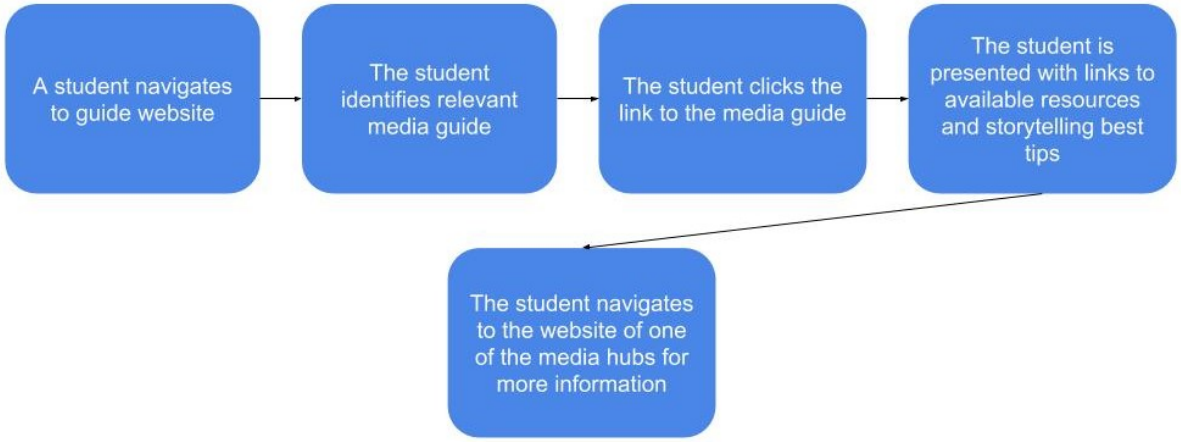


Figure 14: A flowchart of how a student would use the guide website to find information.

See Appendix H for the live URL to our guide website, hosted on WPI's WordPress server.

4.1.4 Supplemental Findings: Other Transmedia Resources

Based on our own experience and recommendations from faculty at WPI, we compiled a list of popular software tools for a variety of media-related tasks. This list is not all-inclusive, and some items are officially supported by WPI (bolded) while others are available to install and use on non-WPI issued devices.

- Photo editing (bitmap)
  - **Adobe Photoshop,** GIMP, Microsoft Photos, Google Photos, Apple Photos, Pixlr editor
- Photo editing (raw)
  - **Adobe Lightroom, Adobe Camera Raw,** DxO PhotoLab 2, Darktable, Rawtherapee, Snapseed
- Video editing
  - **Adobe Premiere,** Blender, Pitivi, OpenShot, Windows Movie Maker, iMovie
- Graphic design
  - **Adobe Illustrator,** Inkscape

- Audio editing
    - **Adobe Audition, Audacity**
- Data visualization
    - **R (ggplot2), MATLAB, Python (matplotlib)**, d3.js, Piktochart
- Website creation
    - **WordPress, HTML/CSS/JS,** Drupal, Wix, Squarespace, Google Sites
- Map creation
    - **ArcGIS,** Google My Maps, OpenStreetMap, Leaflet
- Booklet/pamphlet making
    - **Microsoft Publisher**

Several faculty members also said that students can learn a majority of the media tools through online tutorials, such as those found on YouTube. Online tutorials allow students to pick up skills and use technology that they may not be able to learn from the resources provided by WPI.

The principles of transmedia storytelling as related to the IQP

The seven principles of transmedia storytelling outlined by Henry Jenkins are the basic understanding of the various ways that the use of transmedia storytelling can be created (Jenkins, 2009b). The table below shows how the seven principles can be adapted to the IQP.

Table 8: The principles of transmedia storytelling within the IQP

Principle	Description
Spreadability vs. Drillability	Spreadability: The story about IQP is told across multiple platforms such as the final paper, social media posts, reflections and retelling of experiences Drillability: The ability of students to share the IQP experience in depth through reflections of the activities done on IQP
Continuity vs. Multiplicity	Continuity: The continuation of past projects to the current years' projects. The ability to connect projects that have been done to projects that are being done. Multiplicity: The set of new projects for each site each year reflect new experiences and add new perspectives.
Immersion vs. Extractability	Immersion: The ability of students who have not gone on IQP to understand the experience and projects of various sites through immersive media. Extractability: The ability of students who have not gone on IQP to learn skills and methods from IQPs. The impact of the IQP on those involved should be portrayed as well.
Worldbuilding	Every IQP site is a world. The addition of groups of projects each year is the expansion and development of the world.
Seriality	Each IQP is part of a sites series, and each IQP adds as well as tells another part of the story.
Subjectivity	The students, sponsors, and communities experiences with the IQP. A development of the impact the IQP had on students and communities. Each contribution should be told from their own perspective
Performance	The ability of the project to allow input from people not directly involved with the project and be open to contribution such as comments or a blog

	that can be built upon.

Throughout the seven principles, we found a clear connection to the various aspects of the IQP. The correlation from the seven principles to the IQP process can guide adding transmedia storytelling to the IQP.

4.2 Discussion

In sum, our findings revealed that transmedia storytelling will be a natural progression of expression within the IQP. The current generation of students are already comfortable working with multiple media formats, and many universities are already well situated to host facilities that can amplify data. Based on our analysis, we determined that the IQP embodies most of Jenkin's principles of transmedia storytelling, albeit with some missing components. While our research focused on the IQP, we believe the principles of transmedia storytelling can be applied to other academic projects, such as the MQP and Humanities Capstone. In general, our interviewees believed that a quick-reference media guide, such as ours, is necessary to have in place before any changes are made to the structure of the IQP.

Through a series of case studies, we found that transmedia can be used in an academic setting to enhance the impact of student projects. The experts we interviewed also agreed with this, and believed that transmedia storytelling has the potential to revolutionize education. Many of the recommendations we received focused on creating multimedia content first, and then making a transition to transmedia storytelling. Multiple experts recommended starting with the identification of current media practices and applying the principles of transmedia storytelling over time.

Upon researching the current practices and resources available in media storytelling at WPI, it was evident that many faculty are already experimenting with transmedia education. When asked if these faculty would recommend that others adopt similar media practices when advising IQPs, they were hesitant to say yes. In general, they cited a sharp learning curve, which would be necessary to overcome in order to teach and grade transmedia projects. However, they did recommend that other faculty start with smaller changes, such as having a website for every

IQP. Based on our research, a website would create a strong foundation for transmedia content to be hosted and shared. Faculty also noted several missing ingredients that would make WPI a leader in transmedia storytelling, such as: the lack of media/storytelling focused courses and workshops at WPI, limited reference material or guides for students and faculty, and the varying needs of sponsors.

It is evident that today's students are comfortable learning how to create media through online tutorials, though having hands-on workshops would strengthen their skills and decrease the time needed to learn best practices. The identified media hubs have the capacity to allow students to create transmedia content, and the Global Media Lab is at the forefront of this field. Therefore, we believe that the Global Lab will play an important role in the transition to transmedia storytelling in both digital guides and in-person workshops.

5.0 Recommendations and Conclusion

5.1 Recommendations

Following the completion of our project, the following recommendations were created to further the use of transmedia storytelling within the IQP and other major projects at WPI. Our recommendations include additional courses, workshops, displays and research about transmedia storytelling in academic settings.

5.1.1 Course and workshop recommendations

We identified gaps in the WPI course catalog and training sessions which we believe would be important to fill in order to include more transmedia storytelling into IQPs. In the short term, we believe that the Global Lab can offer workshops on transmedia storytelling techniques and best practices, as well as topics such as data visualization, website design and development, and storytelling through media. These workshops are essential for teams looking to enhance the impact of their project, and the current offerings on campus are limited at most. In the longer term, it would be in WPI's best interest to offer courses on transmedia storytelling, data visualization, and website design for non-CS majors. These courses would allow students to learn vital media skills and best practices which they could apply to their IQPs.

5.1.2 Digital exhibition of transmedia IQPs

We recommend creating a digital showcase in the form of an exhibit or display which will feature the best work in transmedia storytelling that students have done on their IQPs. Having a display such as this would allow students to take inspiration from what other students have done with transmedia storytelling. Further research is needed to decide upon the best format of this showcase. In the short term, we would recommend putting together a page on the Global Lab canvas page or the guide we developed as a part of this IQP which will feature media from selected student projects. In the long term, it would be useful to have a screen near the Global Lab in which students could interact with, to not only promote the Lab and attract attention but to make students more aware of best practices in transmedia storytelling.

5.1.3 The next transmedia storytelling IQPs

The work done within this IQP provides a basis for the path of transmedia storytelling inclusion within the IQPs at WPI. Two project topics that could be developed within two on-campus IQPs have been constructed from the work that needs to be done. The first project would be focused on the creation of 2-3 courses that could be added to the Global Lab's Canvas page. The courses could cover data visualization, transmedia storytelling, and a transformation of the transmedia storytelling guide into a course. The second project would be working with the Global Lab to see what resources students would need to be added to the lab in order for them to add transmedia storytelling principles to IQPs. The IQP could work even closer at incorporating principles by exploring the impact of transmedia storytelling in the IQP process.

5.1.4 Marketing and Undergraduate Admissions display transmedia storytelling projects

Undergraduate Admissions and Marketing showcase various IQPs to prospective students. The IQP is a central point of the WPI undergraduate experience and the marketing of the experience cannot fully portray the impact of the IQP without transmedia storytelling. Parents and students have questions regarding the project that cannot be answered through the IQP report or even a powerpoint presentation. Transmedia storytelling projects would develop answers to questions such as, what is the impact of the IQP and how do students create it, in ways that current projects have trouble providing answers for. Working with both offices at WPI would help distribute the IQP impact on all aspects of the projects.

5.2 Conclusions

The goal of this project was to discover the potential for student project experiences to be enhanced with transmedia storytelling opportunities through the creation of a transmedia guide. The effective use of media to express IQPs will position WPI students to accurately tell the story of their own education, and perhaps bring added visibility to research that meaningfully engages audiences and stakeholders. This is important because the impact of IQP is one that encompasses the effect on the community, the students and the IQP site. The culmination of resources that WPI currently has into a directory for students and faculty will help propel the use of media within projects. The knowledge of resources, capacities and transmedia storytelling ideals placed

into our report will provide the foundation for the next set of projects wishing to create effective media.

The creation of a transmedia storytelling guide will serve as a directory for the resources that are currently available as well as the opportunities to add new information as transmedia storytelling develops. The transmedia guide will also have successful transmedia storytelling projects to help current IQP students successfully integrate transmedia storytelling principles. The transmedia guide will hopefully connect people who work on transmedia storytelling to each other to develop a core of professors and students that can also be points of reference. The recommendations will hopefully continue to give transmedia storytelling a platform to be developed and created within the WPI community.

Overall, this project brought proposed ways to enhance what already exists and extend the functionality of the IQP. Transmedia storytelling provides an important backdrop to the IQP that can broaden the level of impact on the community and the individuals on IQP as well as other projects. This project provided an analysis of the current state of transmedia storytelling in academics and direction to where transmedia storytelling can lead projects. We hope to see transmedia storytelling develop into a concept that works alongside with the IQP.

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Appendices

Appendix A: Interview Questions for Institutions

Arizona State University - Bob Beard

1. How much engagement from the ASU community has the Frankenstein Bicentennial Project had?
2. Why do you think the Frankenstein Bicentennial Project is successful?
3. What would you describe as the goals for the Frankenstein Bicentennial Project?
4. How do you think having a theme, such as Frankenstein, promoted the underlying goals of the project within the community?
5. How do you see other universities creating transmedia storytelling projects, similar to the Frankenstein project, within their communities?

Appendix B: Interview Questions for Experts

Kevin Moloney

1. How would you recommend incorporating transmedia storytelling into IQPs at WPI described above?
2. What components of transmedia storytelling would you recommend including into a guide for students looking to use this in their projects?
3. We have read several posts on your blog, do you have any that you would recommend we read for this project?

Henry Jenkins

1. How would you recommend incorporating transmedia storytelling into IQPs at WPI described above?
2. What components of transmedia storytelling would you recommend including into a guide for students looking to use this in their projects?
3. We have read several posts on your blog, do you have any that you would recommend we read for this project?

Appendix C: Interview Questions for WPI Faculty

Stephen McCauley

1. Can you describe the alternative IQP formats that are under consideration?
2. Which professors are working on alternative IQP formats?

Scott Jiusto

1. What were the most innovative IQPs you have advised?
2. Can you tell us more about how you had the IQP teams in the South Africa project site work together on a shared report? What were the student opinions on that format?
3. What changes have you seen to the IQP process and the way students are doing them in recent years?
4. How do you think the use of documenting personal experiences would change the IQP overall?
5. [Define transmedia storytelling as needed] What are your thoughts on using transmedia storytelling in an IQP experience?
6. Do you have any recommendations that would enhance the IQP experience?

Lorraine Higgins

1. Why did you decide to go with a highly visual booklet format for the projects in Melbourne in B16?
2. Would you recommend that more students produce highly visual booklet formats as a deliverable from their IQP, if so why?
3. Do you have any other recommendations that would enhance the IQP experience?

Katherine Foo

1. Can you tell me more about your experience with using a booklet format for IQPs?
2. Would you recommend that more students produce booklet formats as a deliverable from their IQP, if so why?
3. How did the students react to a booklet compared to students who have done standard reports?

4. As a geographer and landscape planner, do you have any recommendations for students attempting to create maps (interactive or static) within their projects?
5. I also understand that you have used experimental learning techniques with students, can you explain this more?
6. Do you have any other recommendations that would enhance the IQP experience and connect the students more with the community?

Ingrid Shockey

1. Can you describe the recent Iceland project center and how the Global Lab assisted them?
2. What did the teams learn from that session, and did they give any feedback on it?
3. Will the Global Lab continue to do sessions abroad like that?
4. What do you see the role of the Global Lab being in IQPs and MQPs at WPI?
5. How do you envision projects will use transmedia storytelling?

Leslie Dodson

1. Can you tell us more about your use of transmedia storytelling and rich media within IQPs?
2. What kinds of student feedback did you get from the Albania IQP last term?
3. How else could you see transmedia storytelling being used in IQPs?
4. What pieces have you created in transmedia storytelling were successful, which failed?
5. What do you see the role of the Global Lab being if students start to incorporate transmedia storytelling? Do you think most students doing their IQP will utilize the resources of the Global Lab?
6. Do you have any other recommendations that would enhance the impact of IQPs

Robert Hersh

1. Can you tell us more about your use of transmedia storytelling and rich media within IQPs?
2. What kinds of student feedback did you get from the Albania IQP last term?
3. How else could you see transmedia storytelling being used in IQPs?
4. What is your experience with alternative IQP formats?
5. Do you have any other recommendations that would enhance the impact of IQPs?

Fabio Carrera

1. What were the most innovative IQPs you have advised?
2. Can you tell us more Venice soundscape project and your thoughts on projects which deviate from more than a paper deliverable? What were the student opinions on that format?
3. What changes have you seen to the IQP process and the way students are doing them in recent years?
4. How do you think the use of documenting personal experiences would change the IQP overall?
5. [Define transmedia storytelling as needed] What are your thoughts on using transmedia storytelling in an IQP experience?
6. Do you have any recommendations that would enhance the IQP experience?

Lane Harrison

1. What types of data visualizations do you currently see being used in student projects, such as IQPs and MQPs?
2. How does visualizing data enhance the impact of an IQP?
3. Where can students find resources on creating data visualizations?
4. How do you envision IQPs using websites and data visualizations?
5. How do you see topics of HCI being used in IQPs?
6. Do you have any other recommendations that would enhance the impact of IQPs?

Charlie Roberts

1. How can creative coding environments, like Gibber, be used to teach computational media and express data?
2. How can the use of digital arts, such as creative coding, enhance the impact of student projects, such as IQPs?
3. How do you envision topics of HCI being used in IQPs?
4. How do you think audio and visualizations will play a role in IQPs?
5. Do you have any other recommendations that would enhance the impact of IQPs?

Appendix D: Interview Questions for WPI Administrative Offices and Divisions

Center for Project Based Learning

1. What is the purpose of project-based learning at WPI?
2. Can you tell us a bit about this history of project-based learning at WPI and why the switch was made?
3. Do you see another change in the IQPs occuring due to the Internet and available media technology?
4. Do you have any recommendations that would enhance the impact of IQPs?

The Global Lab

1. What resources does the Global Lab have for students to use and what information is given during consultations?
2. Why would a student want to use the Global Lab for their IQP or MQP?
3. What projects have been created by or using the resources of the Global Lab so far (we don't need too much detail, and will not disclose details of any specific project without your consent)?

   The following questions are about the future of the Global Lab:
4. What role will the Global Lab have in student projects?
5. Do you think most students doing their IQP utilize the resources of the Global Lab?

Gordon Library Archives

1. What does Gordon Library archive from student projects, specifically the IQP and MQP?
2. Can you briefly describe the process of archiving student projects?
3. How will the archiving of student projects change with the addition of transmedia (websites, videos, games, etc)?
4. Do you have any recommendations for a guide on creating transmedia projects from an archival perspective? For example, are there certain formats that should be used?

Office of Undergraduate Admissions

1. How does Admissions advertise the IQP to prospective students?

2. Does Admissions every refer potential students to completed IQPs to illustrate project experiences at WPI? If so, which examples do you use or recommend?
3. Would you be interested in having some IQP outcomes that use transmedia to tell the story?
4. Do you have any recommendations for how to make IQPs more engaging and interesting to prospective students?

Interdisciplinary and Global Studies Division

1. How much flexibility is there for the deliverables of IQPs?
2. How do IQPs/project centers get their own websites?
3. How could project centers support continuity between projects over several terms?
4. How will transmedia improve options within IGSD?
5. Do you have any recommendations that would enhance the impact of IQPs?

Division of Marketing Communications

1. What is the relationship between Marketing and IQPs/MQPs at WPI?
2. How would adding multiple forms of media to IQPs affect them from a Marketing perspective (ex. Websites, videos, photos, social media)
3. What are your thoughts on promoting project sites through student blogs or social media run through official WPI platforms?
4. Can you tell us about Project Immersion and Marketing's contribution to the project?
5. Would you be interested in having examples of projects that use transmedia storytelling?

Appendix E: Interview Questions for Other Stakeholders

Donal Boyd

1. What is your experience working with IQP groups?
2. Can you tell us more about documenting IQP experiences, specifically the project where you gave IQP teams cameras to document their highlights?
3. How do you think the use of recording personal experiences would change the IQP overall?

4. [Define transmedia storytelling as needed] What are your thoughts on using transmedia storytelling in an IQP experience?
5. Do you have any recommendations that would enhance the IQP experience?

Appendix F: Questions for Guide User Testing

1. How easy is it to find information about resources on campus for any given medium?
2. Would you reference this guide when creating media for a project on campus?
3. How likely are you to refer a friend to this guide?
4. Would you consider this guide helpful?
5. Did this guide improve your understanding of transmedia storytelling?
6. What changes (additions, deletions, edits) would you recommend for this guide?

Appendix G: Best Practices for File Formats

The recommendations for file formats were given by Arthur Carlson of Gordon Library Archives.

- Photos: TIFF, JPEG
- Videos: MOV
- Audio: WAV
- Documents: PDF
- 3D models: PDF
- Webpages: Online / PDF
- Social media posts: Online
- Maps: TIFF, JPEG

Appendix H: Transmedia Storytelling Resource Guide

The Transmedia Storytelling Resource Guide we developed is located at: https://wp.wpi.edu/transmedia-storytelling-guide/