

March 2014

# Improving the Online Museum Experience: Dimensions of the Museum-Educator Relationship

Benjamin Steven Rude  
*Worcester Polytechnic Institute*

Evan Grant Briggs  
*Worcester Polytechnic Institute*

Michael Raymond Day  
*Worcester Polytechnic Institute*

Ryan John Thornhill  
*Worcester Polytechnic Institute*

Follow this and additional works at: <https://digitalcommons.wpi.edu/iqp-all>

---

## Repository Citation

Rude, B. S., Briggs, E. G., Day, M. R., & Thornhill, R. J. (2014). *Improving the Online Museum Experience: Dimensions of the Museum-Educator Relationship*. Retrieved from <https://digitalcommons.wpi.edu/iqp-all/1711>

This Unrestricted is brought to you for free and open access by the Interactive Qualifying Projects at Digital WPI. It has been accepted for inclusion in Interactive Qualifying Projects (All Years) by an authorized administrator of Digital WPI. For more information, please contact [digitalwpi@wpi.edu](mailto:digitalwpi@wpi.edu).



---

# Improving the Online Museum Experience: Dimensions of the Museum-Educator Relationship

March 6, 2014

Benjamin Rude  
Evan Briggs  
Ryan Thornhill  
Michael Day

# Improving the Online Museum Experience: Dimensions of the Museum-Educator Relationship.



An Interactive Qualifying Project submitted to the Faculty of WORCESTER POLYTECHNIC INSTITUTE in partial fulfillment of the requirements for the Degree of Bachelor of Science

Benjamin Rude  
Evan Briggs  
Ryan Thornhill  
Michael Day

March 6, 2014

Report Submitted to:  
Stephen Owen  
The Museum of New Zealand Te Papa Tongarewa



# WPI

Paul W. Davis  
Vincent J. Manzo  
Worcester Polytechnic Institute

*This report represents work of WPI undergraduate students submitted to the faculty as evidence of a degree requirement. WPI routinely publishes these reports on its web site without editorial or peer review. For more information about the projects program at WPI, see <http://www.wpi.edu/Academics/Projects>.*

## **Abstract**

The Museum of New Zealand Te Papa Tongarewa, located in Wellington, New Zealand, aimed to improve their online resources in order to create meaningful engagement with students and educators. By examining Te Papa's current resources, evaluating the use of their Collections Online (CoL), and exploring other implemented museum models, we were able to understand the important aspects of a successful interactive pedagogical toolkit. We developed and presented potential models such that Te Papa may integrate these results into CoL, allowing greater accessibility to their resources and encouraging its effective use as an educational supplement.



## **Acknowledgements**

The success of our project depended on the help of many individuals. We would like to acknowledge and thank each individual who has guided us and supported us throughout our research.

First, we would like to thank the Museum of New Zealand Te Papa Tongarewa for allowing us the opportunity of working with them and for sponsoring our project. We would like to thank Mr. Stephen Owen and Dr. Claudia Orange for advising us through this process. Their guidance and resources were invaluable to its completion. We would also like to thank Mr. Philip Edgar for his support, aiding us in the technical aspects of our project. Finally, we would like to thank Mr. Adrian Kingston and Mr. Scott Ogilvie for their continued interest during this time.

We would also like to acknowledge Mr. Darren Milligan and the team of the Smithsonian Center for Learning and Digital Access, as well as Mr. Sebastian Chan of the Cooper Hewitt Museum for allowing us to speak with each of them. They provided clarity and valuable suggestions to guide us in our research, and expanded the international museum network that Te Papa holds.

The members of the Expert Reference Group provided inciteful information from the perspective of an educator, aiding us in the success of our project. We would like to thank them for their committed time and effort in our Online Forum Discussion.

Finally we would like to thank Professor Paul Davis and Professor Vincent J. Manzo, our advisors from Worcester Polytechnic Institute, for their guidance and support throughout this entire process. They provided us with suggestions for the improvement of our work and helped us solidify a structure to our report.

## **Executive Summary**

The Museum of New Zealand Te Papa Tongarewa is the premier museum in New Zealand. With the increasing use of technology in the classroom, Te Papa has an opportunity to increase its reach into education by placing the items into its online collection database and providing contextual information to increase the availability and use of these resources. Collections Online (CoL) is Te Papa's first step towards a centralized online database, containing over 200,000 items with images and descriptions.

This project assisted The Museum of New Zealand Te Papa Tongarewa in transforming Collections Online into a useful source of pedagogical information, inciting meaningful engagement between educators and the digital resources provided by the museum. We suggested improvements to the interface's accessibility by investigating New Zealand teachers and their current use of technology inside and outside the classroom. This goal was accomplished through research into the current state of online museum resources and educator interactions, creation of a new benchmarking tool to assess teacher's use and satisfaction with the site, online group discussions with educators, and exploration of potential partnerships between Te Papa and other institutions.

## **METHODOLOGY**

Our project aided the Museum of New Zealand Te Papa Tongarewa in improving their Collections Online to better suit educators. We accomplished our project goals by meeting the following objectives:

- Determine the Priorities and Existing Resources of Te Papa
- Evaluate Educators' Needs of Online Resources
- Determine the Satisfaction and Use of Collections Online
- Explore and Compare Existing Models

To accomplish these objectives, we created and administered an online satisfaction survey with a teacher-specific portion and emphasis on desirable website features, made contact with an 'Expert Reference Group' of 16 Science and Technology teachers throughout New Zealand, and created an online forum to maintain an open dialogue with them. We also

developed a user satisfaction survey for Collections Online, administered upon entering the site and with a portion of the survey devoted specifically to teachers. Finally, we conducted research and analysis into current museum websites and new research into the design of museum websites, including contacting and interviewing Sebastian Chan of the Cooper-Hewitt Museum and Darren Milligan of the Smithsonian Center for Learning and Digital Access (SCLDA).

## FINDINGS

Through the evaluation of our collected information, we discovered that there were different dimensions of museum website design. From these dimensions we developed a framework, which expanded our research to evaluate specific features and to see similarities in other works. Our findings demonstrated the choices museums have when developing this type of website. Providing Te Papa with these findings aided them in improving Collections Online while determining the future path they may want to take.

**Finding 1:** Websites designed for creating content should envelop different features than those intended as a database for supplementing content.

**Finding 2:** Depending on the level of engagement of a user base, implementation of certain features will be most effective in providing and cultivating continuing meaningful engagement.

**Finding 3:** Different methods of website exploration allow all levels of website visitors to explore the site and have a meaningful experience.

**Finding 4:** User accounts can be beneficial to proactive users and for the purpose of content creation but may hinder the experience of other users.

**Finding 5:** Short video clips and other forms of media reinforce key concepts taught in the classroom while keeping students engaged, and are practical for supplementary lesson plan use.

**Finding 6:** Means of collaboration such as social media use, forums or discussion boards, and blogs all incite meaningful engagement.

**Finding 7:** Advertisements for Te Papa's Collections Online should be placed somewhere for educators to find easily while showing the benefits of the site to that specific audience.

By analyzing Collections Online and its associated features, then employing our classification of these features in [Section 4.2](#), we determined that Collections Online is a **supplemental lesson plan** website with a **casual user base**. You can see the complete Museum Website Checklist in [Appendix D](#). This key finding shapes our recommendation in the next chapter.

## CONCLUSIONS AND RECOMMENDATIONS

From our research and findings, we have determined that Te Papa's Collections Online currently serves as a Supplemental Resource, so we suggest continued improvement of its content, media, and users' ability to save information in order to solidify its status as a supplemental lesson plan website; that is, establish a firm baseline before transitioning to a resource designed for content creation. To improve supplemental content we recommend:

- Continue the digitization of items,
- Include and add related visual media and related links,
- Improve the ability to download multiple objects.

Collections Online currently serves a casual user base, and we recommend that Te Papa continues to serve this base, improving upon the ability to browse through the site, interesting visitors, then encouraging them to return. Some steps in this direction include:

- Additional categorization features through 'Tagging'
- Creation of Theme-Based exploration
- Features that promote Non-traditional Browsing

By offering user accounts and by employing social media use, forums, and blogs, Collections Online can transition from a supplementary resource to a resource purposed for content creation.

We determined there are certain questions that Te Papa should continue to investigate to improve Collections Online as a resource for educators.

*We suggest that Te Papa continues to gather information from the benchmarking survey we developed in order to monitor the satisfaction of users with the improved Collections Online website.*

*We suggest that Te Papa evaluates how to increase awareness of Collections Online among its audience group of teachers, showing them the advantages of using the website for their educational purposes.*

*We suggest that future researchers continue to foster inter-museum collaborations and expand upon the network we have initiated.*

*We suggest that future researchers engage teachers as much as possible, inviting them, for example, to work in a focused study, observing them use Collections Online to understand how they interact with the site, which resources they choose to use, and evaluating how each plans on building a lesson plan with the information gathered.*

*Besides assisting the development of Collections Online, these teachers will become more deeply engaged with Te Papa.*

By pursuing these questions, Te Papa will gain a better understanding of educators' wants and needs from an online educational resource and continue to improve their website.

The goal of this project was to improve Collections Online as a pedagogical resource, learning about users' satisfaction with the website, teachers' use of the available resources, and ways of creating meaningful engagement between educators and their resources. Our identification of Collections Online as a supplementary teaching resource used by casual users provides a framework for focusing Te Papa's continuing efforts to improve that site; specifically, we recommend the continuation of digitization and the improvement of browsing and theme based exploration as the most urgent priorities. Furthermore, our work identifies two transition points that would shift those priorities, changing the site from one that supplements lesson plan development to one that creates content for lesson plans and the shift of its user cohort from casual to actively engaged or even proactive.

# **Table of Contents**

<b>ABSTRACT</b> .....	<b>II</b>
<b>ACKNOWLEDGEMENTS</b> .....	<b>III</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>IV</b>
<b>1.0 INTRODUCTION</b> .....	<b>1</b>
<b>2.0 LITERATURE REVIEW</b> .....	<b>3</b>
2.1 MUSEUM HISTORY .....	3
2.2 MUSEUMS AS A PEDAGOGICAL RESOURCE.....	4
2.2.1 <i>Museum Education</i> .....	4
2.2.2 <i>Implementation of Museum Pedagogy</i> .....	5
2.2.3 <i>Public Perception of Museum Experiences</i> .....	6
2.3 SUCCESSFUL MODELS OF ONLINE COLLECTIONS .....	7
2.3.1 <i>Digital collection Access</i> .....	7
2.3.2 <i>The British Museum</i> .....	8
2.3.3 <i>The Powerhouse Museum (Sydney, Australia)</i> .....	8
2.3.4 <i>Smithsonian Museum</i> .....	9
2.3.5 <i>Smithsonian Digital Learning Resources Project</i> .....	10
2.3.6 <i>Summary of Section</i> .....	11
2.4 TEACHERS, STUDENTS, AND INFORMATION LITERACY.....	11
2.4.1 <i>STEM Education</i> .....	11
2.4.2 <i>Technological Skills</i> .....	12
2.5 THE MUSEUM OF NEW ZEALAND TE PAPA TONGAREWA.....	13
2.5.1 <i>Establishment of Online Resources</i> .....	13
2.5.2 <i>Projected Proposal</i> .....	14
<b>3.0 METHODOLOGY</b> .....	<b>16</b>
3.1 DETERMINE THE PRIORITIES AND EXISTING RESOURCES OF TE PAPA .....	17
3.2 EVALUATE EDUCATORS' NEEDS OF ONLINE RESOURCES.....	17
3.3 DETERMINE THE SATISFACTION AND USE OF COLLECTIONS ONLINE .....	19
3.4 EXPLORE AND COMPARE EXISTING MODELS.....	21
3.5 CHAPTER SUMMARY .....	21
<b>4.0 FINDINGS</b> .....	<b>22</b>

4.1 KEY DATA.....	22
4.2 DIMENSIONS OF MUSEUM WEBSITE DESIGN.....	23
4.2.1 <i>Creating Content versus Supplementing Content</i> .....	23
4.2.2 <i>Levels of Engagement of Users</i> .....	25
4.3 IMPORTANT FEATURES OF EDUCATIONAL MUSEUM WEBSITES .....	26
4.3.1 <i>Website Exploration</i> .....	27
4.3.2 <i>User Accounts</i> .....	29
4.3.3 <i>Short Video Clips and Other Media</i> .....	29
4.3.4 <i>Collaborations</i> .....	31
4.3.5 <i>Advertising</i> .....	32
4.4 TE PAPA’S CURRENT STATUS .....	33
4.5 CHAPTER SUMMARY .....	34
<b>5.0 CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>35</b>
5.1 RECOMMENDATIONS FOR SUPPLEMENTAL RESOURCE DEVELOPMENT.....	35
5.2 RECOMMENDATIONS FOR CASUAL USER BASE .....	36
5.3 FUTURE ADVANCEMENTS.....	40
5.4 SUGGESTIONS FOR TE PAPA’S FURTHER RESEARCH AREAS.....	41
5.5 SUGGESTIONS FOR FUTURE RESEARCHERS.....	41
5.6 PROJECT CONCLUSIONS .....	42
<b>6.0 REFERENCES.....</b>	<b>44</b>
<b>APPENDICES .....</b>	<b>47</b>
APPENDIX A: FORUM PROMPTS AND RESPONSES .....	47
APPENDIX B: ONLINE SURVEY.....	60
APPENDIX C: INTERVIEW AGENDAS .....	67
APPENDIX D: COMPARING EXISTING MODELS .....	69
APPENDIX E: SEBASTIAN CHAN TRANSCRIPTION.....	71



## **Table of Figures**

FIGURE 1: PROJECT OVERVIEW GRAPHIC.....	16
FIGURE 2: ONLINE FORUM DISCUSSION BOARD SCREENSHOT .....	18
FIGURE 3: SURVEY FILTERING DIAGRAM.....	20
FIGURE 6: ONLINE FORUM DISCUSSION WORD CLOUD .....	27
FIGURE 7: COOPER HEWITT USER DATA .....	28
FIGURE 8: EXPERT REFERENCE GROUP RESOURCE IMPORTANCE .....	31
FIGURE 9: ADVANCED SEARCH TOPICS.....	38
FIGURE 10: RANDOM BROWSING FUNCTION.....	39

## **Table of Tables**

TABLE 1: SURVEY POPULATION RESPONSE .....	33
---	----

## **1.0 Introduction**

The growing availability of the Internet allows both individuals and schools to access educational information from around the world. Museums have traditionally provided on-site services to visitors, but the advent of the Internet permitted exploration into the museums' digital identity. Along with the online resources that a museum could provide, other interactive teaching tools are emerging throughout the Internet and are being used in schools as a part of their curriculum. With an increase of teachers looking for meaningful and engaging online resources for students, museums should take this opportunity and help the younger generation in learning essential skill sets. Exposure to interactive educational resources early in a student's learning path provides them with a basis for critical thinking advancement.

The Museum of New Zealand Te Papa Tongarewa is the premier museum in New Zealand. With the increasing use of technology in the classroom, Te Papa has an opportunity to increase its reach into education by placing the items within its online collection database and providing contextual information to increase the availability and use of these resources. Collections Online (CoL) is Te Papa's first step towards a centralized online database, containing over 200,000 items with images and descriptions.

From 2012 to 2013 Te Papa undertook a 9-month restructuring process in an attempt to develop into a more efficient and forward thinking organization. It has split its staff into two museums, the Museum of Living Cultures, and the Museum of the Future. In addition, much of 2011 to 2012 was spent preparing their next ten-year strategy. Te Papa is now in a prime position to take a look at its previous relationship between museums and educators, and determine its status in the digital and informational world of the 21<sup>st</sup> century. By examining the ways in which educators connect with Te Papa's online resources, they hope to improve the ways in which their vast collection of valuable data can be quickly and effectively searched through and used.

Te Papa's Visitor and Market Research Department created a short online survey for visitors of their site to complete, in order to gain a basic sense of user satisfaction. From this survey, Te Papa determined that teachers are less satisfied than other demographics that participated, and that teachers should be considered the primary user group to focus redesigns of Collections Online on.

This project assisted The Museum of New Zealand Te Papa Tongarewa in transforming Collections Online into a useful source of pedagogical information, inciting meaningful engagement between educators and the digital resources provided by the museum. We suggested improvements to the interface's accessibility by investigating New Zealand teachers and their current use of technology inside and outside the classroom. This goal was accomplished through research into the current state of online museum resources and educator interactions, creation of a new benchmarking tool to assess teacher's use and satisfaction with the site, online group discussions with educators, and exploration of potential partnerships between Te Papa and other institutions.

## **2.0 Literature Review**

In order for Te Papa to create meaningful engagement with visitors, we must first understand how museums currently educate its audiences. We looked at successful models of online museum resources in order to understand qualitatively what should be featured on the site. How are educators using these online resources in the classroom? If the online resources can be better suited towards educators, then they will be more willing to use them. By understanding how teachers use online resources, we will be able to determine the best way to provide an interactive informational platform. This will aid the Te Papa museum in making a more useful and integrated website and, as a result, increase their satisfaction ratings among educators.

### **2.1 Museum History**

In 1865, the Colonial Museum opened in Wellington in a small wooden building hosting the first collection of artifacts for New Zealand. About forty years later, the museum was renamed to the Dominion Museum and thirty years after that a new building opened in another area of Wellington incorporating the New Zealand Academy of Fine Arts. There existed a need for change, as the museum was physically full and the views of New Zealand, its history, identity, and society had adapted. By 1992, the leaders of the museum realized that there was this need to stay relevant with the changing culture; therefore, the Museum of New Zealand Te Papa Tongarewa Act was passed. This act meant to unite the existing collections and create a partnership between the ‘Tangeta Whenua’ (indigenous Māori peoples) and the ‘Tangata Tiriti’ (people in New Zealand by the Treaty of Waitangi). Te Papa, opened in 1998, has now had over 20 million visits and contains collections spanning art, history, natural history, and Māori and Pacific cultures. With the new museum came a new vision for the future, “E Huri ngākau ana. E huri whakaaro ana. E huri oranga ana” or “Changing Hearts, Changing Minds, Changing Lives” (MNZTPT 2013). The museum plans to change hearts by providing relevant experiences that will be satisfying to the audiences, to change minds by provoking thought, and to change lives by expanding the museum’s collections and resources to impact not only New Zealanders, but also people worldwide. Some of the ways Te Papa has tried to achieve these goals are through the

‘New Directions in Sciences’ program working with sponsors to share collections online and interest audiences in the expanding fields of science and technology.

When Te Papa first opened, they introduced two permanent visual arts exhibitions called *Mana Whenua* and *Parade*, attempting to represent the bicultural nature of the museum. These images were supposed to symbolize the harmony between the Māori and British colonizers, yet the exhibitions forced the visitors to interpret what they had seen. Some audiences believed that the message was demeaning towards the Māori’s as the history of this culture concerns racial discrimination and colonial domination. Some believed that the museum had done a sufficient job in showing the peace between the two groups. Intense debates arose and did not cease until one of the exhibitions was closed in May of 2001 (Brown 2002). Te Papa’s intentions are to establish tranquility between these two cultures and show that they may live together and benefit each other, yet they have encountered issues in the past and are now wary about how they go about their new advancements.

## **2.2 Museums as a Pedagogical Resource**

### **2.2.1 Museum Education**

In order to keep up with new technologies in the workplace today, certain skills need to be emphasized early in a students’ learning career to have lasting impact. Specific skills have been laid out by a U.S. based agency, the Institute of Museum and Library Services (IMLS), which should be covered to ensure one’s ability to acclimate to today’s ever-changing work environments (IMLS, 2009). To suit the needs of museums and libraries around the U.S., the IMLS has updated a skill set previously produced by the Partnership for 21<sup>st</sup> Century Skills. They have placed these skills under three categories: Learning and Innovation skills, Information and Technology skills, and Life and Career skills. These sets touch upon critical thinking, problem solving, information and technology literacy, self-direction, leadership, and adaptability. Along with these skill sets, the IMLS feature 21<sup>st</sup> Century Themes, which involve global awareness and literacy of social issues. The combination of these skills is highly beneficial to younger students who may not have had a lot of hands on experience in their individual school settings. These skill sets, when developing new educational resources and programs, ensure meaningful engagement between students and the information presented to them.

The museum community has realized that these skills are easy to influence students while visiting a museum, but are difficult to bring directly into the classroom. Foreman-Peck states that museums do not need to follow a predefined curriculum and are free to adapt their learning services to experiences that will complement and challenge students who are not accustomed to these curricula (Foreman-Peck, 2013). School curriculums are more structured and do not focus on interaction and learning through interpretation. “The museum educator nurtures the learner’s enjoyment of the unfamiliar or builds and shifts their understanding about the familiar, whether working with a twentieth-century object or an ancient artifact” (2013, p. 36). While the focus of museum education comes down to the individual’s interpretations and how they make these connections themselves, museum educators do aid in the direction of their thinking. This interaction encourages students to make their own conclusions and therefore enables critical thinking, a main skill focus for museums.

### **2.2.2 Implementation of Museum Pedagogy**

The educational goal of a museum is to not only exhibit important works, but also to incite critical thinking and contextual awareness. A short curriculum is a useful tool for teaching students and visitors effectively. This ensures that every visitor receives a brief idea of how to perform a set of skills, including but not limited to critical thinking, creativity, and collaboration. One curriculum approach is called the Visual Thinking Strategies (VTS). Margaret Burchenal states that “the skills involved in ‘learning to look’ – observation, inference, speculation, etc. – are the kinds of critical-thinking skills that are essential to success in subjects across the school curriculum” (2007, p. 112). She explains how VTS was used at an art museum. A set of questions were asked that allowed students to “apply previous experience and knowledge to puzzle over meaning in the artworks – in other words, the students make meaning on their own terms” (2007, p. 115). This would be conducted through group discussions and the educators would encourage collaboration and interaction. Each idea was responded to neutrally to encourage students to share ideas in an equal manner. This type of interaction is much more difficult to achieve in a classroom setting.

Museum websites are an excellent source of information and while some even provide interactive tools, few actually invoke interaction. The type of interaction between the user and an online educational website can affect how well an individual interprets the material presented to

them. There are different levels of interaction between an online interface and a user (Saiki, 2012). The lowest level of interaction is narrative, where a user passively receives information. The next level includes communicative interactions. The highest levels of interactions come from adaptive interactions (where a user receives feedback from an instructor) and productive interactions (where the user recapitulates what they have just learned). Saiki (2010) conducted a study on museum websites to identify what types of interactions the websites have with users. The study concluded that only 24.8% and 22.2% of museum sites featured adaptive and productive interactions, respectively. Museums have the potential to affect their many online visitors, but it is difficult to create more meaningful engagement through websites. Saiki states, “As technology develops and pages become less ‘page-like’ then more features at the adaptive and productive levels may be found strictly online” (2010, p. 61).

Using this information, a museum can determine the effectiveness of its website. If a museum wants their website to be more engaging, they need to go beyond interactivity. The user must make their own decisions and come to their own conclusions. Getting feedback to users about their conclusions is difficult. The most common method of giving feedback is by implementing quizzes that will tell the user if their answers are correct or not. Productive methods are the most effective methods of inciting meaningful engagement (Saiki, 2012). One example of this is the Smithsonian Museum’s online educational website. Their online program now features a project based learning program (Fingal, 2013). Students participate in a group setting and submit a project to the museum, where it is viewed by the educators present, who then give students feedback. Productive interaction is one of the best ways to achieve meaningful engagement with the users and can leave a lasting impression on some students.

### **2.2.3 Public Perception of Museum Experiences**

Museums are continually working to better their online resources to improve online experiences for students and other individuals. Teachers should realize the possibilities that the online resources provided by the museum website can bring to the classroom. A study was recently held at Konya University in Turkey that surveyed primary school teaching candidates. The survey concluded that a vast majority (71.3%) of participants believed that museums resources should be used in a history or social science based lesson, where significantly less teachers (21.53%) believed that these resources would be useful in all class settings (Tas, 2010).



Another significant finding in this study was that the statement “Museums are only the places to exhibit works” held the lowest level of agreement in the survey. Tas states that “this is positive, because teacher candidates are aware that museums’ function is not only to display works” (2010, p. 610). If more teachers recognized the learning potential that is available through museums, then these resources would be used in many more classrooms around the world.

## **2.3 Successful Models of Online Collections**

Museums have continually attempted to engage the public with their educational material since the foundation of the first modern public museum, the Ashmolean museum, in 1677 by the University of Oxford (Swann, 2001). As global access to the Internet has rapidly increased, online integration of museum resources and collections has accelerated. In this section, we first look at the stances that the museum community has on public access to Digital Collections and Resources. We then examine four examples of modern implementation of both collections and resources: the British Museum, the Powerhouse museum, the Smithsonian Institution, and the Smithsonian’s Digital Learning Resources Project, displaying the variety of ways in which museums attempt to maintain relevancy in education.

### **2.3.1 Digital collection Access**

As the internet continues to expand its reach and depth, museums struggle to define their role in online education. Cameron and Mengler posit that museums are driven by 3 dialectics, “a framing founded on elite high culture, a mission promoting democratic education... , and a rationale that seeks to operate above society in terms of the production and dissemination of knowledge” (2009, p. 190).

There exists a division within the museum community over the control or regulation of access to collections. Eschenfelder and Caswell note three major groups: those who see restriction of collections as one of the few remaining ways to recompense the museum for their investment in the collection, those who believe free access to information as a basic human right, and finally a group that sees control over collection access as necessary to protect and preserve individual cultures (2010). As museums seek to put more of their collections online, they are continuing to determine how much control they should have over their own material and its use

by the public. While sections 44-49 of the New Zealand Copyright act of 1994 exempt copyright infringement when items are used for educational purposes (New Zealand Legislation 1994), this is still relevant when proposing new models to Te Papa.

### **2.3.2 The British Museum**

While work to digitize the British Museum's collections began in 1979, the collection was only made available to the public on October 2007 (The British Museum, n.d.). Though not designed specifically to engage with and help educators, it presents instead a more traditional model of the online collection, with a variety of useful tools that allow easy self-navigation. The site also offers 'online tours', which present a series of related collection items and use them to illustrate and discuss a particular subject, including some of their physical exhibitions (Liew, 2005). Additionally, it has a 'Learning' section, which is itself divided into 'Schools and teachers', 'Family learning', and 'Adult learning' subsections. Educators can select resources by grade, and choose by topic (<http://www.britishmuseum.org/learning/>).

A unique feature of the British Museum's website is the "Community Collaborations" portion of the website, which clearly outlines three subgroups of "Partnerships", "Sessions", and "Training" ([http://www.britishmuseum.org/about\\_us.aspx/](http://www.britishmuseum.org/about_us.aspx/)). This part of their site clearly displays to the curious visitor how the British Museum engages in the community and in which programs the website visitor can participate in. A partnership they have, "Talking Objects," has young people talk about the meanings, histories, and implications of collection objects. "Supplementary Schools" offers activity weekends for the supplementary and community schools in London. A supplementary pilot training program for teachers on how to make the most out of class visits is a prime example of one of the types of sessions offered. Together, these online resources provide a strong base for the British Museum to expand its reach into the local and global community, while still maintaining a research-oriented collection database.

### **2.3.3 The Powerhouse Museum (Sydney, Australia)**

The Powerhouse Museum, located in Sydney, Australia, contains more than 350,000 items in its collection including, "covering: decorative arts and design; Australian history and society; engineering and design; the sciences; Koori (indigenous) history; and culture and transport" (Cameron & Mengler, 2009, p. 192). In 2004 the Powerhouse Museum unveiled a new

website designed to engage people wanting to visit the museum in person. The museum's online collection could originally only be searched through Australian Museums Online (currently Collections Australia Network), an Australian museum collaboration portal; however, Chan notes, "object records in this catalogue search had not been updatable since 2001" (2007).

In June 2006 the Powerhouse Museum implemented an internal collection search on their website, and instituted internal improvements to the site to increase visibility of their pages on search engines like Google (Cameron & Mengler, 2009). Chan (2007) noted the vast improvement:

Overall visitation to the Museum's Web site has climbed from 228,246 visits in May [2006] to 571,432 in December [2006]. Of these total visitation figures, on-line collection visitation was 17,394 (7.85% of total visitation) for May, which grew to 355,180 (62.15% of total visitation) in December.

The Powerhouse Museum has demonstrated how changing key aspects of the way in which collection items are displayed, both internally and in search engine results, can result in a more useful collection database that can reach a much wider audience.

#### **2.3.4 Smithsonian Museum**

The Smithsonian Institution is recognized the world over as a premier source of history, science, art, and culture through its 19 museums and 9 research complexes located throughout the United States (<http://www.si.edu/About>). Government run and headquartered in Washington D.C., its online collection database, the Collections Search Center, contains over 8.1 million catalogue records with over 850,000 images, videos, audio files, and other supplemental information (<http://collections.si.edu/search/about.html>). The site employs folksonomies (collaborative 'tagging') to aid in searching, and more importantly has a tutorial page that explains how to get the most out of searching. It appears that the direct collection site and internal search engine are designed for specific searches. Though the site layout is daunting and its search engine tools unintuitive, it appears that the Smithsonian has taken an indirect approach to more effectively engage visitors with its incredibly vast collection. A primary example of this would be their education website.

[Smithsonianeducation.org](http://Smithsonianeducation.org) was launched in September 2003 by the Smithsonian Center of Education and Museum studies (subsequently renamed the Smithsonian Center for Learning and

Digital Access or SCLDA) (Clough, 2013). This site is stated by its creators to be, “the gateway to the [Smithsonian] Institution’s educational resources and programs.” It divides the site into 3 portals tailored towards educators, families, and students respectively. Educators are provided resources for field trips, professional development, and lesson plans, along with a resource library. The resource library provides the ability to search through [smithsonianeducation.org](http://smithsonianeducation.org) and the Smithsonian collections itself, as well as providing on and offline resource recommendations for educators to provide to their students.

### **2.3.5 Smithsonian Digital Learning Resources Project**

The Smithsonian Center for Learning and Digital Access is currently collaborating with the Maryland College of Education Faculty to, “explore thousands of Smithsonian digital resources through guided, informal learning activities in history and STEM areas” through their Digital Learning Resources Project (<http://smithsonian-digital-learning.wikispaces.com>). An internal review determined that many educators were taking the Smithsonian’s published educator resources and deconstructing them to adapt them to their specific needs curriculum requirements. After a comprehensive research report that included determining the wants of educators and the assets that the Smithsonian Institution should provide, the information was used to create a prototype website toolset, of which a limited prototype can be used at <http://scems.navnorth.com/> (Teacher Toolkit (Project Overview)).

The teacher toolkit allows users to create virtual presentations with each slide based around a specific webpage. A search engine provides results from the collection of every Smithsonian Institution museum, and also allows any other webpage to be added. Results from Smithsonian collections contain preset information summarizing the image, video, audio file, or webpage link. Teachers can attach questions, quizzes, further reading material, and other resources to each slide. The tool allows teachers to comb through the Smithsonian Institution’s digital resources as well as adding their own to their presentations, and once created can be distributed to students for them to use. The other useful feature of this setup is that the online presentations can be used to guide students to education resources and pages and allow them to discover how to use them. Finally, the Smithsonian is looking to allow users to share their presentations with each other, allowing peer-to-peer communication between educators.

The toolset will be used and evaluated during the 2013-14 academic year at the College Park Academy middle school in Maryland. This represents an exciting current development in communication between museums and educators, and whether it succeeds or fails it will provide invaluable data to the international education and museum communities.

### **2.3.6 Summary of Section**

While museums see a necessity in storing information about their collections online, they are still divided on the amount of control the museum and public should have over the material. The Powerhouse Museum can only display 3% of its collection at any given time ([www.powerhousemuseum.com](http://www.powerhousemuseum.com)): storing the rest of their collection online to be viewed becomes a necessity to ensure the public is given access to their entire collection in some form. Museums attempt to maintain their education positional by community collaboration like the British Museum, improving their internal software to extend the reach of their collection like the Powerhouse Museum, aligning resources with curriculum like the Smithsonian Institution, or creating engaging toolkits that integrate the aggregation of collection information with the rest of the internet with peer-to-peer collaboration. It appears that the most successful museums are ones that not only try all these methods and more, but create an open, visible, and active communication with the public as they try and better balance the Museum's needs with those of the public it serves.

## **2.4 Teachers, Students, and Information Literacy**

As Te Papa works towards improving Collections Online (CoL), an important limitation comes into play: the effectiveness of the site given the current student and teacher education in both technology and online research. This section explores the difficulties faced by student and teacher alike, as the need for effective online searching and comprehension is brought into schools.

### **2.4.1 STEM Education**

According to the American Library Association (ALA), "To be information literate, a person must be able to recognize when information is needed and have the ability to locate,

evaluate, and use effectively the needed information ... information literate people are those who have learned how to learn.” As this suggests, the ability to locate information and become information literate with respect to the Internet is crucial (ALA 1989).

Science, Technology, Engineering, and Mathematics (STEM) education is one of the most effective ways to achieve information literacy. A study on the effects of student questions and STEM showed that students who were given a framework of STEM-like questions asked more, higher quality questions. There were three groups present in this study; all three groups were students from the same school, with the same level of education. The students were required to have a short lecture on a science related article, and afterwards were asked to respond to the lecture with questions about the subject. The three groups had different foundations with which to format questions. The “No Stem” group was the control, with no structure provided with which to ask questions. The “Simple Stem” group was given simple frameworks (i.e. Explain...? or Why important...?). The last group, the “Detailed Stem” group, was given framework with more directional questioning (i.e. What are possible solutions for...? or What would happen if...?). The results of this study suggest that students with STEM education would be more likely to ask the type of high quality questions necessary to learn effectively and completely, as opposed to those without STEM education (Hu and Chiou).

#### **2.4.2 Technological Skills**

Another aspect to information literacy is the ability to search and locate information online. Many students have been born after technology has become commonplace. They are considered “digital natives”, as opposed to much of the older population (this includes most teachers). Those born before the digital age are known as “digital immigrants,” terms coined by Prensky (2001). As a result, many students have great understanding of technology, while teachers may struggle with basic use of technology. In an age where there is an increasing demand to use technology in the classroom, teachers struggle to provide students with useful resources and information websites that can be trusted. A survey conducted by the University of Auckland prompted teachers to “list anything you know from research or experience about students’ digital literacy.” Of the 13 that responded, 12 commented about “...students being well informed and confident when using the Internet, that they could access information and navigate between pages and sites, and that in all of these things they knew more than their teachers”

(Ladbrook & Probert 2011). How can teachers teach something they have less experience and knowledge in? This question is further complicated by the students.

Students trust many sites as accurate, despite the fact that these sites are not verified. This is mainly due to the fact that students' interactions with technology are based on social networking sites, and have little to no experience with research and analysis of the resulting information. Teachers, while lacking the search skills, expressed frustration when correcting students' work because of the lack of critical thinking and analysis involved with effective research. The students could not effectively analyze what was necessary to their research, and often resorted to cutting and pasting sections of text without regard for importance (Ladbrook & Probert 2011). These gaps in ability for both student and teacher are important in realizing an underlying limitation on CoL implementation in classrooms, and must be investigated further.

## **2.5 The Museum of New Zealand Te Papa Tongarewa**

### **2.5.1 Establishment of Online Resources**

With Te Papa's goals of Changing Hearts, Changing Minds, and Changing Lives, they attempt to take their collections to the people and encourage a deep and meaningful engagement with the information available. The museum's approach to achieve this was to establish Collections Online (CoL), an online database containing images, information, pictures, videos, stories, and other resources on more than 200,000 items in their collections. Not only has the organization published CoL on their own website, but they have also expanded to third-party platforms such as the *Google Art Project*, *Digital NZ*, and *History Pin* (MNZTPT 2013). Digital NZ, run by the National Library of New Zealand, is one of the most prominent of these groups, allowing users to create their own search tools and linking them to the Services to Schools site that provides resources geared towards learning (MNZTPT 2013). With CoL displayed through Digital NZ, more users are able to access the resources available.

One of Te Papa's major developments in online resources is the introduction of *Tales from Te Papa*, a set of mini-documentaries focusing on items within the CoL. Each video is approximately three minutes in length and is straightforward, starting with the introduction of the subject matter in a local, national, or global setting before an expert explains some background of the item. By using this medium, the museum is able to engage the audience and create a



personal connection; however, they have encountered some problems in the development of these Tales. The more important and technical problem is that users are virtually unable to find these *Tales from Te Papa* unless they had previous knowledge of them and search for them explicitly (Dalley 2010). On the CoL site, a user would have to navigate through multiple pages while clicking links that are not intuitive for finding this sort of material in order to access the videos. Without a direct link on the home page or any mention of the creation of this medium in the new media developments pages of Facebook, Twitter, or Flickr for example, the Tales are a great idea that can be improved.

### **2.5.2 Projected Proposal**

The Museum of New Zealand Te Papa Tongarewa feels the need to increase the usability of their Collections Online and recognizes a few ways of doing this. Te Papa realizes the need to stay relevant in order to meet audience's expectations and has created a three-year statement of intent explaining their hopes for the future. The CoL already contains images and information of over 200,000 items within the collections but some are either incomplete or completely missing from this group; therefore, Te Papa plans to continually update these records with the aid of the curators. As part of upgrading the records, they wish to include high-resolution images, links, and context, though they will need the approval of copyright owners. Te Papa also plans to implement an Open Access Licensing framework enabling visitors to download these high-resolution images that will be available under no known copyright or Creative Commons licenses for use in their own meaningful ways (MNZTPT 2013).

The Internet has become a primary source of information, entertainment, and socializing, and audience members desire the ability to contribute to the creation of published content. To determine the impact of the physical and online sites, Te Papa created a department called the Visitor and Market Research Unit (VMR), which have been implementing Visitor Profile Interviews (VPI) since the opening of the site in 1998. This unit has amassed a plethora of information about the museum's audience; for example, adult visitors tend to be younger, well educated, and more affluent. One categorization method the group has used was by setting members of the interviews into groups based on their frequency of visiting the museum. Frequent visitors were found to value a pedagogical challenge and seize opportunities in their

free time while one-time visitors value social interaction, active participation, and familiar surroundings (Davidson 2011).

Te Papa can now shift their focus from drawing on-site visitors to meeting the needs of the audiences and stakeholders. The museum strives to expand their collections and relevant resources to accommodate more areas of New Zealand such as Christchurch and Auckland as well as smaller communities that currently do not have access to the information. In order to proceed towards this goal, Te Papa plans to implement some digital upgrades. First, so that members of the organization will be able to use the resources themselves more efficiently and build computing skills, a training program will take place. An update to the software, hardware, and the ability to remotely access the computers at the museum will also allow greater ease with using the technology present. By attending conferences and engaging in conversation with international institutions, Te Papa will be able to redesign their current site with the hopes of a greater impact on their audiences. Finally, the museum states that they have compared their progress with institutions worldwide and are attempting to adopt a digital benchmarking tool (MNZTPT 2013).

### 3.0 Methodology

Our project aided the Museum of New Zealand Te Papa Tongarewa in improving their Collections Online to better suit educators. We accomplished our project goals by meeting the following objectives:

- Determine the Priorities and Existing Resources of Te Papa
- Evaluate Educators’ Needs of Online Resources
- Determine the Satisfaction and Use of Collections Online
- Explore and Compare Existing Models

Shown in [Figure 1](#) is our project overview graphic that shows the many paths of our methodology, leading to our recommendation of a potential model.

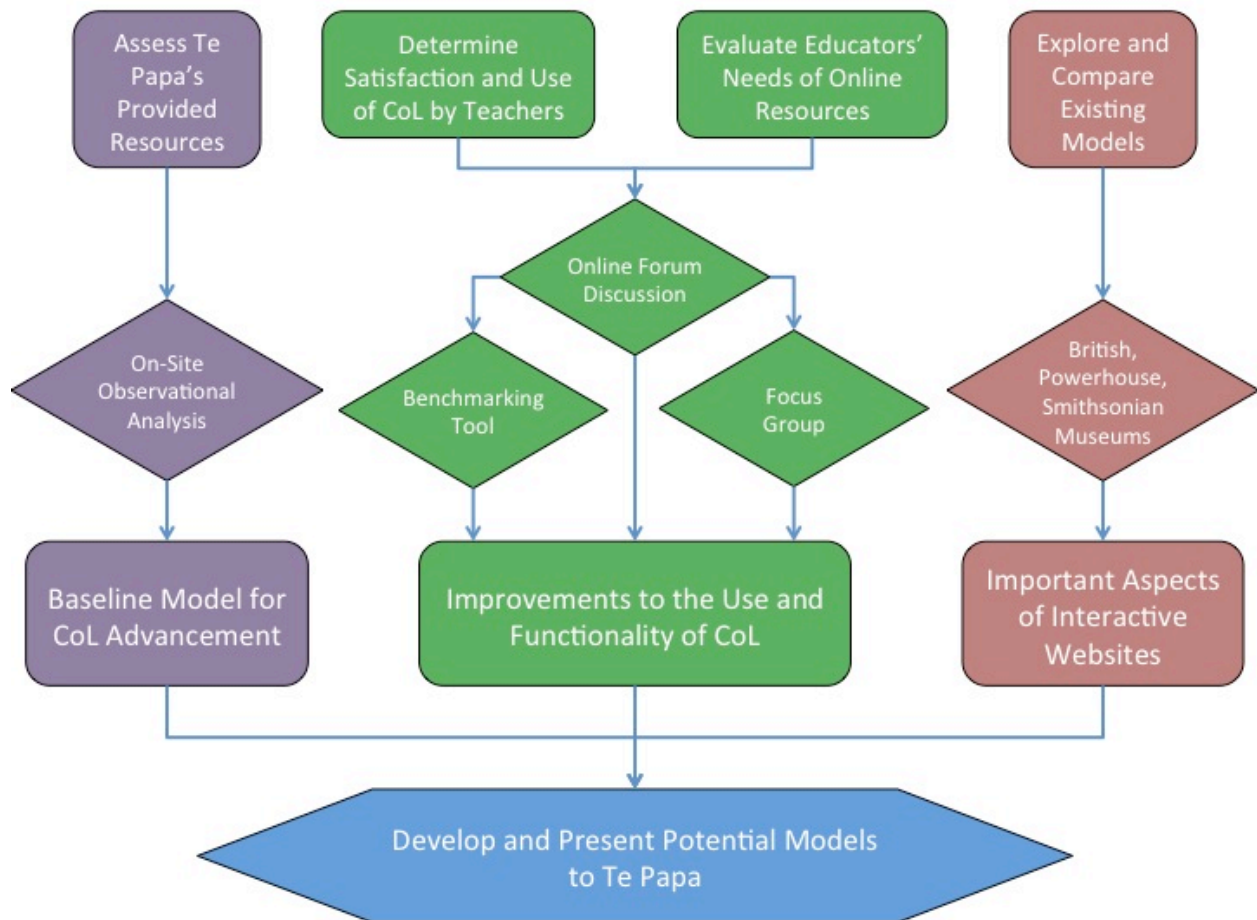


Figure 1: Project Overview Graphic

In this chapter we cover the methods used to complete these objectives as well as justify each research method and its relevance to our project in order to make recommendations for improvements to Collections Online.

### **3.1 Determine the Priorities and Existing Resources of Te Papa**

The Museum of New Zealand Te Papa Tongarewa currently exists as the national museum of New Zealand. Their vision, as stated in [Section 2.1](#) of this paper, is “Changing Hearts. Changing Minds. Changing Lives.” In order to fulfill this vision of staying true within the community and relevant in an ever-changing society, we evaluated the current resources that Te Papa offers and its priorities in expanding these resources.

We learned about our sponsor more in-depth with a comprehensive observational analysis and interviews with museum leaders. To understand how the museum runs and receive insight towards our project, we spoke with Stephen Owen, the Visitor and Market Research Manager and our project manager, and Dr. Claudia Orange, the Director of Collections and Research. These leaders then introduced us to other staff with different concentrations pertinent to certain aspects of our project, including Philip Edgar, the Collections Information and Digitisation Manager, Adrian Kingston, the Digital Collections Senior Analyst, and Scott Ogilvie, an Educator at Te Papa of the Education and Outreach Department. With the help of these staff members, we focused and narrowed our efforts on laying the groundwork of the Collections Online advancement. When talking with the museum staff, we focused on certain topics including the hierarchical structure of Te Papa, the motivations behind advancing Collections Online, the intended audience of this improvement, and their opinions on the current situation.

### **3.2 Evaluate Educators’ Needs of Online Resources**

Te Papa wants to ensure that teachers are able to access resources from Collections Online in order to improve their curriculum. To best serve Te Papa, we determined what resources and types of information are most beneficial to educators. To develop a basis for the information needed from educators, we created an online forum asking teachers to respond to

prompts we developed. Prior to our arrival, members of Te Papa contacted teachers throughout New Zealand and assembled a small (n=16) Expert Reference Group (ERG) to aid our progression. Unfortunately, some educators dropped out, which left us with only 12 respondents; this may be due to the fact that the group was assembled early and a new school year had begun. For this group we used an online forum, as they were spread throughout the country, hindering the possibility of meeting in person with all of them at once. This virtual discussion allowed for a conversation to occur between respondents on their own time, easing the process for them and saving the information directly online. After creating a forum discussion board, we posted prompts semi-weekly for a period of two weeks. The prompts and responses are located in [Appendix A](#) and a screenshot of the forum board is shown below in [Figure 2](#).

**Where Students First Meet Science and Technology**

Home Help Search Welcome Guest. Please [Login](#) or [Register](#).

Where Students First Meet Science and Technology > Home >

Please consider supporting this website by disabling your ad-blocker. This website does not use audio ads, popups, or other annoyances. Thank you!

News Your responses will help Te Papa improve their Collections Online!

**Survey**

Board	Threads	Posts	Last Post
Survey Comments Any comments about the survey go here.	1	5	Survey Comments and Link by Barb Feb 7, 2014 at 10:52pm

**Prompts**

Board	Threads	Posts	Last Post
Prompt Set 3	1	6	Prioritization of Improvements for Te Papa: 11/2/14 by rick Feb 14, 2014 at 1:56pm
Prompt Set 2	2	16	Ideal Resource Website: 5/2/14 by rick Feb 14, 2014 at 1:50pm
Prompt Set 1	2	18	Students Engagement with the Internet: 3/2/14 by mattp Feb 12, 2014 at 8:56pm

**General**

Board	Threads	Posts	Last Post
General Board You can talk about anything here. Moderator: Admin	2	5	Questions by Admin Feb 15, 2014 at 11:14am

**Legend**

New Posts No New Posts

[Click here to remove banner ads from this forum.](#)

This Forum Hosted For FREE By [ProBoards](#)  
Get Your Own [Free Message Boards & Free Forums!](#)  
[Terms of Service](#) | [Privacy Policy](#) | [Notice](#) | [FTC Disclosure](#) | [Report Abuse](#) | [Mobile](#) | [Advertise Here](#)

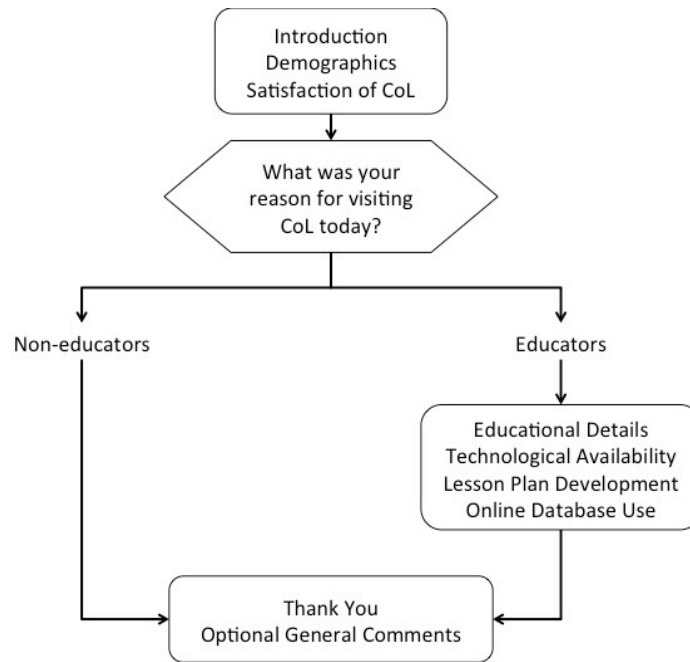
Figure 2: Online Forum Discussion Board Screenshot

To use the information provided by these posts effectively, we decided to use a word cloud to quickly and visually view the main points of responses. After compiling, coding, and analyzing the information, we created a list of the needs and requirements that teachers have of online resources and online collections.

### **3.3 Determine the Satisfaction and Use of Collections Online**

As Te Papa continues to update and expand Collections Online, the need to effectively report and analyze issues related to this site is crucial. Before our arrival, there was a four-question survey on Collections Online regarding any users' experience, which provided a good baseline to analyze the major problems; however, this survey lacked depth to effectively determine the severity or importance of problems reported. As a result, we:

- Used the existing survey as a basis for a new survey, focused on all users' satisfaction.
- Introduced 5 Point Likert Scale questions in place of yes-no questions regarding the satisfaction of the site.
- Created an educator specific portion of the survey to get more focused data regarding their use and satisfaction of the site as well as the importance of certain resources when developing a lesson plan. A diagram of the filtering process is shown in [Figure 3](#).
- Included questions regarding demographic information to see if trends in satisfaction or use of the site exist based on age, gender, or location.
- Implemented the survey on Collections Online and reached out to Wellington based New Zealand schools with a different collector allowing us to view their responses separately.



**Figure 3: Survey Filtering Diagram**

The survey questions asked are located in [Appendix B](#) of the report. Before we implemented this survey directly on Collections Online, we asked the ERG for help fixing potential issues and optimizing flow. We also spoke with Stephen Owen and Philip Edgar of Te Papa who have experience creating similar surveys. All of these individuals clarified confusing questions, helped us eliminate bias, and focused the questions to gather the most accurate and beneficial data. We then updated the survey and introduced the final set to gather data from users of Collections Online.

Scott Ogilvie provided us with a list of 50 teachers and their contact information from the Greater Wellington Region, acquiring this information from educators who registered for Primary Science Week in 2013. With this help, we created a copy of the survey that we emailed to these teachers. Unfortunately, this snowball survey was ineffective, producing only three respondents.

The survey provided a benchmarking assessment to Te Papa that will be useful for longer than our time on-site, as they can continue to gather data on the satisfaction and use of Collections Online.



### **3.4 Explore and Compare Existing Models**

Te Papa's current Collections Online lacked a separate educator portal that teachers may use to aid in the development of their curriculum. In [Section 2.3](#) of this paper, we provide background information on existing museum educational sites and programs that attempt to create meaningful engagement with teachers and students. We evaluated the complexities behind these sites and assessed the success of these models. We examined certain features on each site and classified them by their relative strengths.

We spoke with Darren Milligan, the Senior Digital Strategist, and his team, involved in the Center for Learning and Digital Access at the Smithsonian Institution. Additionally we spoke with Sebastian Chan, formerly the Head of Digital, Social and Emerging Technologies at the Powerhouse Museum and currently the Director of Digital & Emerging Technologies at the Cooper-Hewitt Museum. In these conversations, we focused our questions on how museums deal with the issue of the development of educational resources and digital access to the information available. The agendas for each interview are located in [Appendix C](#). Contacting the developers of the sites and interviewing them gave us a better understanding of the implementation of certain features as well as the best ways to obtain information from teachers.

### **3.5 Chapter Summary**

By completing the previous objectives, we understood the research problem from multiple perspectives and created different models, each from a different background. In our final weeks of this project, we developed multiple potential models that could be implemented at Te Papa and delivered our findings to our liaisons. We presented our opinions on the strengths and weaknesses of each design as well as suggested one model specifically; Te Papa was still able to choose between the models.

## **4.0 Findings**

With our review of various museum websites, our discussions with Darren Milligan of the SCLDA and Sebastian Chan of the Cooper Hewitt, and our online forum and survey, we identified different dimensions of museum website design. In this chapter, we explain the discovery of each of these dimensions with the supporting evidence as they relate to our objectives. From these dimensions we developed a framework, which expanded our research to evaluate specific features and to see similarities in other work. We conclude this chapter by explaining how the parts of the framework can work together to provide a solid museum website design for educators. Our findings demonstrate the choices museums have when developing this sort of website. Providing Te Papa with these findings aided them in improving Collections Online while determining the future path they may want to take.

### **4.1 Key Data**

By critically surveying seven museum collection websites, including Te Papa's Collections Online, the Museum of Modern Arts (MOMA), the Powerhouse Museum, the British Museum, the Smithsonian Center for Learning and Digital Access (SCLDA), the Smithsonian Institution, and the Cooper Hewitt Museum, we noticed features that were both similar and unique between the sites, and noted each of these. These features are located in [Appendix D](#). Common features found on almost all sites include item pictures, descriptions, biographical information and a search function. The SCLDA's site contained features such as user accounts, collaborative tagging, community collaboration, and comment sections. The only other site in our evaluation that also had these functions was the MOMA Learning website. These features seemed unique in comparison to the rest of the museums, as most others instead contained videos, grouping by themes, related links, a blog, social media integration and an advanced search function. While MOMA covered both of these aspects, the SCLDA only covered their unique features.

After speaking with Darren Milligan and Sebastian Chan, the developers of the SCLDA's site and Cooper Hewitt sites respectively, we understood why different sites chose to incorporate certain features. Chan believes that museums had a browsing problem rather than a searching

problem (Chan, S. February 5, 2014). The transcription of our interview is located in [Appendix E](#). Additionally, from both of these talks we recognized that the user base of a site greatly impacts its success.

The Expert Reference Group permitted a closer look into the specific wants of educators. The online forum prompts and responses for this group are located in [Appendix A](#). Through our coding, we discovered that teachers are concerned with their own engagement when developing a lesson plan, beyond the students' engagement in the classroom. Some of the biggest categories the teachers mentioned were the ease of finding resources, the sharing of these resources, and the ability to give back to the community.

The benchmarking survey we implemented directly on Collections Online gathered data from 88 respondents, six of whom were educators. The survey questions are located in [Appendix B](#). From a set of optional questions regarding one aspect that the user was very satisfied or very dissatisfied with, we found that 54% and 33% of responses respectively mentioned visual media. Specifically, many users were satisfied with the pictures or videos that were on Collections Online, while others expressed their dissatisfaction with the actual amount of objects that had this visual media.

## **4.2 Dimensions of Museum Website Design**

### **4.2.1 Creating Content versus Supplementing Content**

Finding 1: Websites designed for creating content should envelop different features than those intended as a database for supplementing content.

From our museum websites comparison ([Appendix D](#)), we saw common and unique features between websites. The Smithsonian Center for Learning and Digital Access website allowed users to search through the resources available and compile them for developing a lesson plan on site. This was a completely different aspect to a museum website, one that went beyond features. MOMA Learning has similar features to those of the SCLDA, as users that visit this site are able to collaborate with the community and download premade resources. The Cooper Hewitt Museum's online database lacked some of the features of the others, but is more powerful in engaging the user in the exploration of the site. Similarly, the British Museum not only

encouraged users to explore the site, but also provides links to external websites, such as the BBC for additional information. From our background research and museum website evaluation, we formed a hypothesis that there were two classifications of how museum databases aid teachers in the creation of their lesson plans. The features and classifications are shown in [Figure 4](#).

In our interview with Milligan, he described the problems with the original Smithsonian Educational Site, which had fully developed lesson plans for users to download and implement in the classroom. Although these lesson plans were available, most educators only took parts of the presentations to supplement their own lesson plans, rather than the fully developed resource. To combat this problem, Milligan and his team developed the SCLDA’s site. In this way, the Smithsonian had made a conscious decision to be the main source for the development of lesson plans, the content creation website, whereas Te Papa and many other museums act as a database for resources, a supplemental content website.

Sebastian Chan agreed that the SCLDA is taking a role in the creation of lesson plans, “The Smithsonian as a whole still feels that people want to come to [it’s online properties] and trust it as the first place they go, but all the evidence would show it’s not the first place they go [on the web]” (Chan, S. February 5, 2014). The challenge with the Smithsonian is whether or not users actually visit and trust it as the first site. We asked our Expert Reference Group a prompt regarding which websites they regularly use to gather content for their lesson plans and what role museums have in this stage ([Appendix A](#)). Of the six educators who responded, four mentioned that they have used museum websites before. Two stated that they only rarely use these websites and the other two said that they only use them

	Museums Features
Common	Pictures
	Item Description
	Biographical Info
	Search
Supplement Content	Videos
	Grouping
	Related Links
	Blog
	Random Function
	Social Media
	Advanced Search
Create Content	User Account
	Collaborative Tags
	Lesson Plan
	PowerPoints
	Community Collab
	Comment Section

**Figure 4: Content Creation versus Supplementation Features**

for a specific purpose; for example, a known exhibit or an explicit topic. From these responses, it is clear that some teachers would not necessarily use the SCLDA's site, as they are only searching to supplement their lesson plans. Collections Online might not be a resource for content creation; this is not necessarily a problem, but certainly a choice.

Looking at additional research from other museum website developers, the role of the website and its available features is only one part of the development of said site: "Research has demonstrated that audiences are seeking these kinds of interactive experiences from museums (Kelly 2006) and that the shift from education to learning has required a refocusing on the visitor or user, not on the delivery systems (Hooper-Greenhill 2003)" (Russo, Watkins, Kelly & Chan, 2008). The features of a site allow the visitor to be engaged; yet the developers of the site must evaluate their audience base to better suit the features for them.

#### **4.2.2 Levels of Engagement of Users**

Finding 2: Depending on the level of engagement of a user base, implementation of certain features will be most effective in providing and cultivating continuing meaningful engagement.

On the online forum ([Appendix A](#)), one educator said, "I think its [sic] important that the collection is not just a one-way delivery of content" (Online Forum Respondent #8). A common theme throughout the forum was that a museum website should not solely be a database, but instead should consist of a community where users can give back and communicate with other users and the museum.

In our interview, Milligan discussed the results of a study involving teachers and their development of lesson plans using the Smithsonian Toolkit. These teachers volunteered to work for three weeks on this project suggesting that there is a classification of users that is willing to aid in the advancement of a tool that would help them improve their lesson plan building.

Speaking about the Cooper Hewitt museum, Chan states, "We have massively increased the access to our collection, but we've broadened the types of people who use it. As we've broadened the types of people who use it, all those types of users have different needs and different wants and sometimes non-compatible wants as well" (Chan, S. February 5, 2014). This alerted us to the fact that different groups of users have different needs from a website that would benefit the experience of one group, while possibly hindering the experience of another. We

classified users into three groups with different degrees of engagement, casual, actively engaged, and proactive users. We reclassified the museums and their features, this time by the level of engagement of a user, shown in [Figure 5](#).

	Museums Features
Casual	Pictures
	Item Description
	Biographical Info
	Videos
	Grouping
	Related Links
	Random Function
Actively Engaged	Search
	Advanced Search
	PowerPoints
	Lesson Plan
Proactive	Blog
	Social Media
	Community Collab
	Comment Section
	User Account
	Collaborative Tags

We define casual users as those who would visit a website without a certain purpose in mind. These users prefer to browse and explore what the website has to offer, and may or may not return. Actively engaged users are those who would visit for a specific reason, searching through the website trying to find specific material. Proactive users are those who are actively engaged, but additionally collaborate and contribute to improve the website community for both themselves and others. These users post comments, collaboratively tag items, and engage in discussions hosted by the website. The members of our Expert Reference Group would be classified as proactive users, as they are giving back to the community and attempting to improve their own experience.

### 4.3 Important Features of Educational Museum Websites

After discovering and establishing a framework for museum website design, we determined what specific features are invaluable to educators. The Expert Reference Group

**Figure 5: Level of Engagement Features**

identified key features to analyze. A word cloud including the most common words or phrases on the forum appears in [Figure 6](#); the more common a word was said, the larger the word physically appears.



Figure 6: Online Forum Discussion Word Cloud

We can see from this figure that the topics of interactivity and engagement come into play frequently, but other topics such as search, links, tagging, key-concepts, guidance, short-clips, and sharing are still extremely relevant.

### 4.3.1 Website Exploration

Finding 3: Different methods of website exploration allow all levels of website visitors to explore the site and have a meaningful experience.

Sebastian Chan speaking about his experience at the Powerhouse stated, “One of the things we learned at [the] Powerhouse Museum was 'really that' museums suffer from a browse problem rather than a search problem” (Chan, S. February 5, 2014). Casual users are visiting the site without a purpose and plan on exploring to see what it has to offer. Teachers of the online forum also discussed browsing problems ([Appendix A](#)). Of seven respondents to a prompt regarding their ideal resource website experience, all mentioned browsing as well as the concept of grouping by different themes was important in maintaining their interest.

Through our museum website comparison ([Appendix D](#)), all (seven) sites featured a grouping by themes, six offered a search ability, five offered an advanced search, but only two offered a random function: Te Papa’s Collections Online and the Cooper Hewitt Museum. Chan

stated in our interview that, “Random and Color [Search] dominate search [at Cooper-Hewitt] by a huge amount. [Currently] people prefer to navigate using those means” (Chan, S. February 5, 2014). The Cooper Hewitt, being an extremely visual Design Museum, invented a browsing option by color, where a user can find objects that have a specific color in them. Some data that the Cooper Hewitt has gathered from their users is shown in [Figure 7](#) (Chan, S. December 11, 2013).

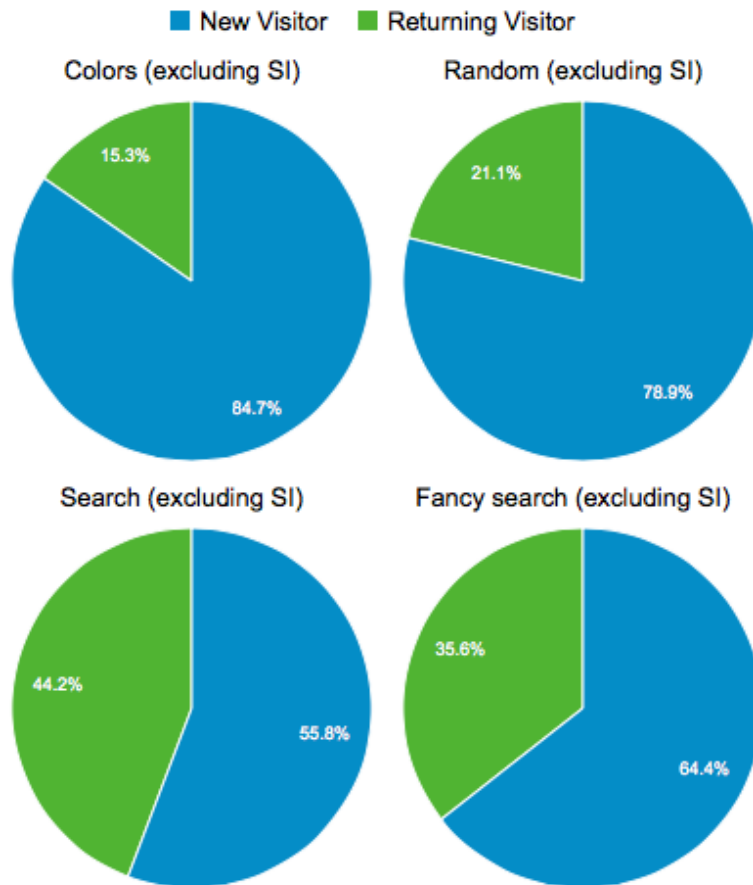


Figure 7: Cooper Hewitt User Data

New visitors to the site preferred to use the color browsing or random function, while returning visitors used the search or fancy [advanced] search function. Both of these methods of exploration resulted in “healthy browsing depths” (Chan, S. December 11, 2013). These unique ways of exploring the site hook casual users into returning to the site at a later time. Browsing is one of the most effective means of inciting meaningful engagement by casual users, improving their experience. By improving this experience, casual users are more likely to transition to an actively engaged audience, and if they choose to, this transition would be significantly easier.



A PhD thesis, by Mette Skov, regarding a military museum supplemented this idea of exploratory behavior. The author explains that the museum expected users' to search through the site gathering content, yet they found, even with a rigid collection, the users preferred to browse (Skov 2009). Te Papa's general collection is much more broad and varied than that of the military museum in the study; therefore, with the wide range of information available, the improvement of browsing for Collections Online and its users is a must.

#### **4.3.2 User Accounts**

Finding 4: User accounts can be beneficial to proactive users and for the purpose of content creation but may hinder the experience of other users.

A website designed as an educational resource for content creation typically has actively engaged or proactive users; if casual users were to visit this sort of site, they would be turned away by its complexities. Sebastian Chan stated, "We're really trying to remove that sense of the burden of having to think that you will return to the site. User accounts are a challenge of 'what's the value to the user of having a user account?' [and is that clearly articulated]" (Chan, S. February 5, 2014). Casual users, if exposed to mandatory user accounts, will feel the burden to return to the site, possibly shying them away from using the website again.

Chan also stated, "But I think the challenge with user accounts is that unless you have a cohort of users that come to your site regularly, why do they need an account?" (Chan, S. February 5, 2014). In this way, if proactive users visit the site regularly, then a user account would be valuable to them. When responding to a prompt regarding an ideal resource website, one online forum respondent stated, "Perhaps the visitor could have 'an account' and be able to save items and information from the collections that most interest them. Effectively creating their own personal collection" (Online Forum Respondent #8). A user account would not only allow users to save information that interests them specifically, but also by creating their own personal collection, they feel more inclined to return to this site and their interests.

#### **4.3.3 Short Video Clips and Other Media**

Finding 5: Short video clips and other forms of media reinforce key concepts taught in the classroom while keeping students engaged, and are practical for supplementary lesson plan use.

Out of the eight members that replied on the forum ([Appendix A](#)), seven of them explicitly mention using short video clips in their lesson plans. One respondent stated, “I often use very short video clips of scientists or parts of videos with interesting facts/demonstrations/animations to explain a key idea. the short clips are the best. The students don’t want to sit through lengthy vids. the idea is that we then pair, share after viewing and it is short enough to play again” (Online Forum Respondent #7). Many educators use short videos to engage their students, to interest them in the subject at hand, and to reinforce the key concepts that they have taught in the classroom. Shorter videos are more effective than showing a longer video that contained more informational content. Another respondent said, “As teachers we are perhaps moving away from the more traditional lecturing approach. Your suggestion of interactive or short tutorials that students can view either with or without a teacher being present would be quite powerful” (Online Forum Respondent #8). The educators continued to express a theme of guidance for students when searching through the Internet. The educators felt that these short interactive videos could be viewed inside the classroom to reinforce and supplement the lesson taught, or outside of the classroom to engage students in learning more about the subject themselves.

The Expert Reference Group rated the importance of each resource when developing a lesson plan, the results are shown in [Figure 8](#).

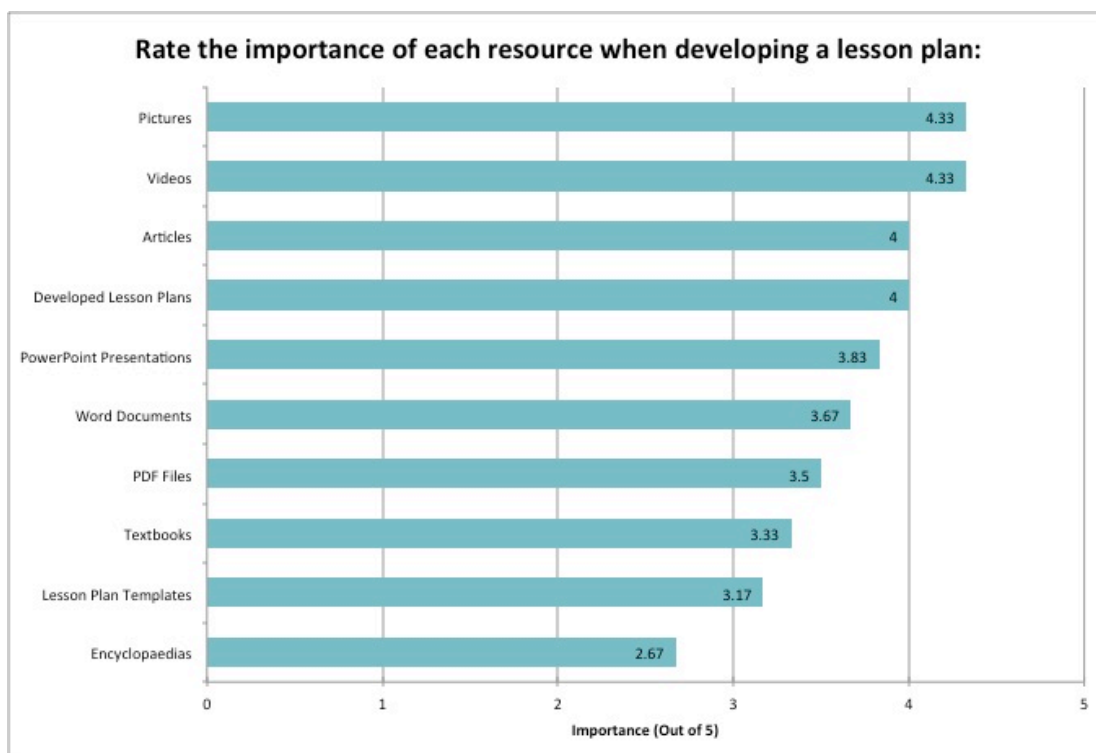


Figure 8: Expert Reference Group Resource Importance

Shown in this chart, supplemental resources such as pictures and videos are rated as the most important resources when developing a lesson plan, whereas text heavy or offline materials such as encyclopaedias or textbooks are less important.

Expanding the survey ([Appendix B](#)) to all users of Collections Online, 33.3% (11 out of 33) of respondents to an optional question asking their dissatisfaction with one aspect of the site explicitly mentioned that the amount of visual media available on Collections Online was insufficient.

Te Papa currently offers *Tales from Te Papa* on Collections Online, which are three to five minute informational videos. These reinforce some key concepts, yet they are difficult to find throughout the site. If Te Papa wants to focus their Collections Online into a supplementary resource for teachers, short informational video clips are important and must be easily accessible.

#### 4.3.4 Collaborations

Finding 6: Means of collaboration such as social media use, forums or discussion boards, and blogs all incite meaningful engagement.

Our online forum indicated that many users want to collaborate and be proactive ([Appendix A](#)). One respondent states, “In terms of interactivity and visitor participation, perhaps users could upload pictures of their own 'specimens' and people could leave comments. I think that this could be potentially very cool to get some discussion going and for a curator to be able to give feedback. A chance for people to contribute to the collections, where relevant, with anecdotal stories. For most young people they like to be able to contribute, even if its just 'liking' something!” (Online Forum Respondent #8). Many students and users enjoy giving an input. By contributing, even if just showing their interest, users feel that they have given back to the community for the improvement of the site and its resources.

Students are particularly interested in social media, as the language and features provided are geared towards a younger audience; therefore, social media is a valid way of collaborating and contributing. Others agree with the successfulness of social media stating, “It is proposed that museums could use social media to create or improve popular knowledge-sharing networks, in which cultural participants share images, information, and experiences throughout communities. By promoting user-generated content, museums could enable cultural participants to be both critics and creators of digital culture” (Russo, Watkins, Kelly & Chan, 2008). For users to become critics and creators of this digital information, they are proactively engaged within the site while sharing the information they have learned with others and improving the existing information from others.

#### **4.3.5 Advertising**

**Finding 7: Advertisements for Te Papa’s Collections Online should be placed somewhere for educators to find easily while showing the benefits of the site to that specific audience.**

One respondent to a prompt on the online forum regarding the use of museum websites when developing a lesson plan stated, “I rarely use museums as their databases are not well advertised. I tend to only come across them by accident. I would like to use their resources to increase the number of examples I can expose the students to” (Online Forum Respondent #2). Another respondent confirmed this thought saying, “Also, it needs to be better ‘advertised’ to schools. I had hardly been to the site prior to the invite to take part in this group. None of my colleagues had ever visited the site [Collections Online]” (Online Forum Respondent #11).

Members of this online forum were dissatisfied because they did not know of the site’s existence. They expressed a common theme of the want to use a different sort of resource, such as a museum, to supplement their knowledge, yet most did not even know of these sites or their offerings.

From our benchmarking survey, we determined the general educator population of Collections Online. Shown in [Table 1](#), 6.82% (6 out of 88) of respondents to our survey, stated that they were visiting Collections Online as an Educator or Teacher, whereas many visited as either students, for professional use, or for interest and fun.

Answer Choices	Responses	Percentage
Professional	13	14.77%
Educator/Teacher	6	6.82%
Student	17	19.32%
Personal/Community	11	12.05%
Interest/Fun	22	25%
About Te Papa	1	1.14%
Other	18	20.45%
Total	88	

Table 1: Survey Population Response

#### 4.4 Te Papa’s Current Status

We analyzed Collections Online and its associated features, then employing our classification of these features in [Section 4.2](#), we determined that Collections Online is a **supplemental lesson plan** website with a **casual user base**. You can see the complete Museum Website Checklist in [Appendix D](#). This key finding shapes our recommendations in the next chapter.

On February 25<sup>th</sup> 2014, less than two weeks from the completion of this report, a new Collections Online was introduced to the public. Because of this short time before completion of the report, our analysis and recommendations are based on the previous site.

## 4.5 Chapter Summary

From our investigation of museum websites we developed two dimensions that frame important features: one based on the level of engagement users experience during their visit, the other focusing on museum websites' use in development of lesson plans. After identifying key features present in many museum websites, we grouped these features based on the mentioned dimensions. We also discovered evidence for improving browsing features, user accounts, video clips, comment sections, as well as suggestions to advertise to teachers. Finally, we determined that Collections Online is a website for supplementing lesson plans, and has a casual user base. Using these findings, we move forward to our recommendations.

## **5.0 Conclusions and Recommendations**

In this chapter, we present recommendations for the advancement of Collections Online as a pedagogical resource. From our benchmarking survey, we determined that users are somewhat satisfied with the current website; therefore, Te Papa may move forward with the improvement of their website specifically for the audience group of educators. Our recommendations can be a baseline for this improvement, inciting meaningful engagement between teachers and their resources. We also provide guidelines for further research on this subject.

### **5.1 Recommendations for Supplemental Resource Development**

*From our research and findings, we determined that Te Papa's Collections Online currently serves as a Supplemental Resource, so we suggest continued improvement of its content, media, and users' ability to save information in order to solidify its status as a supplemental lesson plan website; that is, establish a firm baseline before transitioning to a resource designed for content creation.*

#### **Continuation of Digitization**

Throughout our analysis, we found that Collections Online and other museum databases are used primarily for “Supplemental Content” of lesson plans. With a supplemental mindset, features of the website that have visual aspects to them are essential for educators using the website. Only about 20% (of approximately two million objects) of Te Papa's total collections have been digitized and many website visitors were dissatisfied with the website due to the lack of pictures. Many of the resources on the website have information about the object, but the majority (70%) lack pictures. We strongly suggest that Te Papa continue digitizing their entire collection, as most users want to be able to see the exhibits Te Papa has to offer. This should be the main priority of Te Papa as they advance further with their website.

#### **Related Media, Videos, and Links**

Websites that are suited for “Supplemental Content” should offer other forms of media, alongside pictures, to users. Our findings show that shorter video clips are useful for adding to lesson plans. Te Papa offers the *Tales from Te Papa* video series on their website. These short video clips can be used to supplement and help enrich lesson plans regarding the topics discussed. At the moment, the series is very difficult to navigate to without searching for them explicitly. Making these videos easier to find will allow educators to view them and understand what Te Papa’s educational videos have to offer. We recommend using a link on the front page so that within a couple of clicks, users will be directed to the page with the list of videos. This will bring more website traffic to the videos, allowing more educators to know of these resources and use them in their lesson plans.

We also strongly suggest that Te Papa should implement related links to external websites, bridging the gap in their own knowledge with the information from other websites and databases. Links to videos on other educational websites would increase the amount of media available to teachers about a specific topic.

### Downloading Ability

The ability to download selected resources is an important feature of a resource website. Educators look at websites to gather images and information for their lesson plans and other purposes. Providing a tool that allows educators to quickly download resources that they have found throughout their visit is beneficial. We recommend that Te Papa look into ways to make downloading selected resources easier for the users of their website. An idea similar to a shopping cart is an effective way of accomplishing this. A download button that would allow a user to add objects to their cart can be added underneath the pictures. Options could be added to download pictures, information, or both about the object. The download button should only be available for pictures that are not bound by any copyright laws. This tells users which objects cannot be downloaded without having to explain why particular objects are bound by copyright.

## **5.2 Recommendations for Casual User Base**



*Collections Online currently serves a casual user base, and we recommend that Te Papa continues to serve this base, improving upon the ability to browse through the site, interesting visitors, then encouraging them to return.*

### Categorization by Tagging

The following recommendations are made based upon Collections Online's audience, specifically how the majority of users are classified as casual users. With casual users, websites need to focus on browsing methods, allowing users to explore seamlessly through the entirety of the website. Users are able to choose what groups of the collection they would like to look at, providing an interactive experience. This is the most basic method of exploration through the website. As the categorization becomes more varied, the museum can provide a better experience to users with different interests. We recommend that Te Papa builds upon their categories and use the extent of their already implemented tags on collections to provide more exploration paths to the users.

Within the advanced search currently on Collections Online, users could search through the collections by categories such as associated place, person, subject, or period. A screen shot of this advanced search is shown below in [Figure 9](#).

**Associated subject**

City walls ▼

**Associated activities**

voting ▼

**Associated period**

Te Tipunga period (1200-1500) ▼

**Associated parties**

Saffron Walden Museum ▼

**Associated places**

Nuhaka ▼

**Associated iwi/ethnic group**

Te Uri-o-Hau ▼

Figure 9: Advanced Search Topics

However, casual users prefer to browse, and since this feature is part of the advanced search function, many would not find it. By simply allowing users to browse by these different categories directly on the front page, casual users would find it easier and be more enticed to use it. This can be done by displaying subcategories with mouse-overs and with the help of drop-down menus, allowing this browsing within a few clicks of the main page.

### Theme-Based Exploration

Another method of exploration we have observed on other museum database websites is the ability to look through collections by themes. This method of exploration is similar to an on-site museum experience, where the exhibits are grouped to show an over-arching theme. We recommend that Te Papa improve upon current theme based exploration on Collections Online. This is a great addition to theme based browsing, and if new exhibits are put into the museum,

they can be transferred online as well. This will add a variety of browsing methods to Collections Online and will allow casual users to explore the collections that Te Papa has to offer without physically visiting the museum.

### Random Browsing

A non-traditional browsing method used in Collections Online currently is the random browsing function. This function should continue to be used as it allows new users to get a sense of what Te Papa has to offer, as it brings them resources from any part of their database. From our findings, non-traditional methods of exploration are useful for the new and casual users. It is a great tool for pulling new users into the site and also is a great browsing tool. We recommend to Te Papa to explore ways of expanding upon this non-traditional method. One possible improvement to this tool is adding filtering options, an example is shown in [Figure 10](#).

Random me ▾

Show me a random collection item from:

- All
- Art & Design
- Photography
- History
- Pacific Cultures
- Taonga Maori
- Natural Sciences

GO!

Figure 10: Random Browsing Function

This filtering option will allow a user to find random resources within a specified collection. This transforms the function of the “Random” button from basic full site exploration, to an advanced collection browser.

### **5.3 Future Advancements**

*With our recommendations for immediate improvement, we leave Te Papa with additional recommendations for the further development and improvement of Collections Online, including the ability to transition from a supplementary to content creation resource and from a casual to actively engaged user base.*

#### Transition from Supplementation to Content Creation Resource

We found certain features that will aid in the transition from a supplementary resource to a resource designed for content creation. By offering user accounts and by employing social media use, forums, and blogs, Collections Online can begin this transition. User accounts will encourage users to collect information that interests them and provide a reason to return. If users then connect the information to their social media and share the resources through these external sites or use a forum or blog on Collections Online, they can collaborate with other users and create a discussion they are engaged in. Even though these features will aid in the advancement of Collections Online, we do not suggest collaborative tagging to be implemented, as Te Papa’s collections are so broad that this tagging may hinder the experience of the users. When museums have broad collections, collaborative tagging has the unfortunate effect of combining many unrelated items under the same tag, which may confuse and hinder searching.

#### Transition from Casual to Actively Engaged User Base

In order to transition from a supplementary resource to a content creation resource, the user base must be more engaged. For the casual group to transition into an actively engaged user base, the features listed previously in [Section 5.2](#) (tagging, themes, grouping, random function) must be improved. With a better baseline for casual users, more will be interested in returning to the site and then further their engagement with the site. Returning users normally revisit the site to find content, so by improving the search and advanced search functions, these users will start

to engage in looking for something specific in the site rather than just browsing in order to be interested. With the implementation of PowerPoints and Lesson Plans, users will be able to download resources and learn additional information about certain topics, allowing them to meaningfully engage with the site.

#### **5.4 Suggestions for Te Papa's Further Research Areas**

*We suggest that Te Papa continues to gather information from the benchmarking survey we developed, in order to monitor the satisfaction of users with the improved Collections Online website.*

Our benchmarking survey implemented on Collections Online collected information on all users' satisfaction of the site, as well as specifically teachers' use of museum websites as a pedagogical resource. We were able to gather 88 responses in the two weeks the survey was online, but only 6 of the respondents were actually visiting as an educator. This survey opens a field for further research; first, it can be implemented periodically on Collections Online to gather additional information; second, the survey questions can be expanded to specific features and specific groups of educators. This will determine if the improvements to the site have been beneficial to the user base and aid Te Papa in evaluating its priorities for further advancement.

*We suggest that Te Papa evaluates how to increase awareness of Collections Online among its audience of teachers, showing them the advantages of using the website for their educational purposes.*

When we discovered that many educators were not aware of the site or the resources it has to offer, we determined that Collections Online must be advertised specifically to the audience base of teachers. Without any additional information, we suggest that another field of further research be on the effective ways of advertising.

#### **5.5 Suggestions for Future Researchers**

*We suggest that future researchers continue to foster inter-museum collaborations and expand upon the network we have initiated.*

Our work for Te Papa also provides room for future researchers to continue improving upon it, helping Collections Online improve. By connecting Te Papa with the Smithsonian Center for Learning and Digital Access and the Cooper Hewitt Museum as well as the developers of each site, Darren Milligan and Sebastian Chan, we have established ties between Te Papa and the international museum community. These developers expressed their enormous interest in continuing to converse over the issues that Te Papa is facing, as many museums worldwide are facing similar issues.

*We suggest that future researchers engage teachers as much as possible, inviting them, for example, to work in a focused study, observing them use Collections Online to understand how they interact with the site, which resources they choose to use, and how each plans on building a lesson plan with the information gathered. Besides assisting the development of Collections Online, these teachers will become more deeply engaged with Te Papa.*

Milligan and Chan also gave us knowledge of possible other methodologies that would help us understand the problem we are facing more in depth, but warned us of the time, effort, and cost of such studies. One specific methodology they stated included focus group studies with many teachers for a first hand experience. By bringing teachers into a group, providing them with resources specifically from Collections Online and viewing how they use them, they may learn more detailed information about each person's experience.

## **5.6 Project Conclusions**

The goal of this project was to improve Collections Online as a pedagogical resource, learning about users' satisfaction with the website, teachers' use of the available resources, and ways of creating meaningful engagement between educators and their resources. Our identification of Collections Online as a supplementary teaching resource used by casual users provides a framework for focusing Te Papa's continuing efforts to improve that site; specifically,

we recommend the continuation of digitization and the improvement of browsing and theme based exploration as the most urgent priorities. Furthermore, our work identifies two transition points that would shift those priorities, changing the site from one that supplements lesson plan development to one that creates content for lesson plans and the shift of its user cohort from casual to actively engaged or even proactive.

## **6.0 References**

- American Library Association (1989). Presidential Committee on Information Literacy: Final Report. Chicago: American Library Association.  
<http://www.ala.org/ala/mgrps/divs/acrl/publications/whitepapers/presidential.cfm>
- The British Museum. (n.d.). *History of Collection Database Project*. Retrieved from The British Museum website:  
[http://www.britishmuseum.org/research/search\\_the\\_collection\\_database/about\\_the\\_database/history\\_of\\_the\\_project.aspx](http://www.britishmuseum.org/research/search_the_collection_database/about_the_database/history_of_the_project.aspx)
- Brown, M. (2002). Representing the Body of a Nation: The Art Exhibitions of New Zealand's National Museum. *Third Text*, 16(3), 285-294. doi: 10.1080/09528820110160709
- Bundy, A. (2004). *Australian and New Zealand Information Literacy Framework*. (2nd ed.). Underdale, South Australia: Library Publications. Retrieved from  
<http://www.literacyhub.org/documents/InfoLiteracyFramework.pdf>
- Burchenal, M. & Grohe, M. (2007) Thinking Through Art: Transforming Museum Curriculum. *The Journal of Museum Education*, 32(2), 111-122.
- Cameron, F., & Mengler, S. (2009). Complexity, transdisciplinarity, and museum collections documentation. *Journal of Material Culture*, 189-218.
- Chan, S. (2007). Tagging and searching - Serendipity and Museum Collection Databases. In J. Trant, & D. Bearman (Ed.), *Museum and the Web 2007: Proceedings*. Toronto: Archives & Museum Informatics. Retrieved from  
<http://www.archimuse.com/mw2007/papers/chan/chan.html>
- Clough, W. (2013, April 30). *STEMming the Tide of Scientific Illiteracy*. Retrieved from The Torch: <http://www.e-torch.org/2013/04/stemming-the-tide-of-scientific-illiteracy/>
- Dalley, B. (2010). Tales from Te Papa. *New Zealand Journal of History*, 44(1), 115-116.
- Davidson, L., & Sibley, P. (2011). Audiences at the “New” Museum: Visitor Commitment, Diversity and Leisure at the Museum of New Zealand Te Papa Tongarewa. *Visitor Studies*, 14(2), 176-194. doi: 10.1080/10645578.2011.608009
- Eschenfelder, K. R., & Caswell, M. (2010). Digital Cultural Collections in an Age of Reuse and Remixes. *Proceedings of the American Society for Information Science and Technology*, 47(1), 1-10.



- Fingal, D. "Smithsonian Quests." *Learning & Leading with Technology* June-July 2013: 47. *Academic OneFile*. Web. 3 Nov. 2013.
- Foreman-Peck, L. & Travers, K. (2013). What is Distinctive About Museum Pedagogy and How Can Museums Best Support Learning in Schools? An Action Research Inquiry into the Practice of Three Regional Museums, *Educational Action Research*, 21:1, 28-41, DOI: 10.1080/09650792.2013.761924
- Hu, Hsin-Wen & Chiou, Guey-Fa. (2012). The Types, Frequency and Quality of Elementary Pupils' Questions in an Online Environment. *Turkish Online Journal of Educational Technology - TOJET*, 11(4), 325-335. <http://files.eric.ed.gov/fulltext/EJ989286.pdf>
- Institute of Museum and Library Services (2009). Museums, Libraries, and 21st Century Skills (IMLS-2009-NAI-01). Washington, D.C.
- Ladbrook, J. & Probert, E. (2011). *Information Skills and Critical Literacy: Where are Our Digikids at with Online Searching and are Their Teachers Helping?* <http://www.ascilite.org.au/ajet/ajet27/ladbrook.pdf>
- Liew, C. L. (2005). Online Cultural Heritage Exhibitions: A Survey of Information Retrieval Features. *Program: Electronic Library and Information Systems*, 39(1), 4-24.
- Mannoni, B. (1996, June). Bringing Museums Online. *Communications of the ACM*, 39(6), 100-150. Retrieved from [http://delivery.acm.org/10.1145/230000/228524/p100-mannoni.pdf?ip=130.215.9.116&id=228524&acc=ACTIVE SERVICE&key=C2716FEBFA981EF1FF99909242D6E79151FEB3BC50CED6B0&CFID=376916253&CFTOKEN=52087736&\\_\\_acm\\_\\_=1383863180\\_28699c1c564b9bb8774930cbec647c33](http://delivery.acm.org/10.1145/230000/228524/p100-mannoni.pdf?ip=130.215.9.116&id=228524&acc=ACTIVE SERVICE&key=C2716FEBFA981EF1FF99909242D6E79151FEB3BC50CED6B0&CFID=376916253&CFTOKEN=52087736&__acm__=1383863180_28699c1c564b9bb8774930cbec647c33).
- Museum of New Zealand Te Papa Tongarewa. (2013). Statement of Intent 2013/14 2014/15 2015/16.
- New Zealand Legislation (1994). *Copyright Act of 1994*. Retrieved from <http://www.legislation.govt.nz/act/public/1994/0143/latest/DLM345634.html>
- Russo, A., Watkins, J., Kelly, L., & Chan, S. (2008). Participatory Communication with Social Media. *Participatory Communication*, 51(1), 21-31.
- Saiki, D. (2010). Interacting Online: A Content Analysis of Museum Education Websites. *Journal of Learning Design*, 4(1), 52-62.

- Skov, M. (2009). *The reinvented museum: Exploring information seeking behaviour in a digital museum context*. Københavns UniversitetKøbenhavns Universitet, Det Humanistiske FakultetFaculty of Humanities, Det Informationsvidenskabelige AkademiRoyal School of Library and Information Science, Det Informationsvidenskabelige Akademi-TeknologiDet Informationsvidenskabelige Akademi-Teknologi.
- Swann, M. (2001). *Curiosities and Texts: The Culture of Collecting in Early Modern England*. Philadelphia: University of Pennsylvania Press. Retrieved December 5, 2013, from Project MUSE database.
- Tas, A. (2012). Primary-Grade Teacher Candidates' Views on Museum Education. David Publishing. Retrieved From: <http://eric.ed.gov/?id=ED535482>.
- Teacher Toolkit (Project Overview)*. (n.d.). Retrieved November 16, 2013 from Digital Learning Resources Project Wiki: <http://smithsonian-digital-learning.wikispaces.com/Teacher+Toolkit+%28Project+Overview%29>.
- The University of Waikato. Retrieved November 14, 2013 from Science Learning Hub New Zealand: <http://www.sciencelearn.org.nz>.

## Appendices

### **Appendix A: Forum Prompts and Responses**

**1) In education and in museums like Te Papa, interactivity and engagement are vital in sparking and holding interest in a topic. What sorts of assignments have created the most engagement between your students and the science and technology fields? Please note where the concept came from, if any of the assignment involved using the Internet (and to what degree), and the level of involvement of the students.**

**EDIT : For the purposes of this question, we are defining "assignments" as an in-class project (either in a group setting or individually).**

#### Online Forum Respondent #7-

When you say assignments, do you mean projects or is this a general term for a piece of work? If we are working on a unit, the best work comes from a good combination of hands-on activities, well resourced and a topic that has meaning/is relevant to the students. some websites offer really good interactives that can be shared with the whole class or I can email the links to the students and they love putting on their headphones and working through these. I use these to reinforce concepts. I often use very short video clips of scientists or parts of videos with interesting facts/demonstrations/animations to explain a key idea. the short clips are the best. the students don't want to sit through lengthy vids. the idea is that we then pair,share after viewing and it is short enough to play again.

{Online Forum Respondent #8 and Online Forum Respondent #4 liked this post}

#### Online Forum Respondent #8-

I think provocative questions/ideas can be useful in promoting early engagement with students. Last year my Y9 students watched an activist documentary (The Last Ocean). From here they were tasked with learning more about the fishery industry and the scientific research that was underpinning the management of the fishery. In other words learning more about the other side of the story. This is where the internet helped, allowing them to search for more information. Education is currently using the buzz word "wicked problems". Basically these are complex contemporary challengers facing humanity. Biodiversity and conservation, feeding the world, sustainability, health etc. This is where educationalists are now encouraged to go. Rather than the simple content knowledge approach where students just learn facts.

I think its important for students (and extend to include all citizens) feel that they are taking a participatory approach to their learning, with the ultimate aim that students DO something with their knowledge.

#### Online Forum Respondent #3 -

Hi,

I am also unsure what you mean by assignments (it makes me think of independent projects?). Learning engagements that have had high engagement levels include dissections (eyes, hearts, fish etc) and practical chemistry sessions. Students have also been highly engaged when I bring in University lecturers to answer some of their questions. I find that the technology I (and students) have access to enables these lessons to happen and creates more effective learning

opportunities from these experiences. For example- creating and collating questions to email to experts, recording and reflecting on dissections or using interactive models to learn about the function.

#### ADMIN-

Sorry for the confusion everyone. For the purposes of this question, we are defining "assignments" as an in-class project (either in a group setting or individually). We are also making a note in the original post for future readers.

#### Online Forum Respondent #4-

Biggest engagement is from when they make something, so they have something to show for it at the end of the project. They use technology to find ideas of what to make, how to make it, create the logos and relevant assignment explanations. This includes creating their own (sci-fi) invention, a marble track out of newspapers to explain Newton's Laws and a wall map linking geographic origins of popular New Zealand meals. This last group project relied heavily on resources from the internet. This brings in the second biggest form of engagement: food.  
{Online Forum Respondent #2 liked this post}

#### Online Forum Respondent #11-

Hands-on things definitely engage students more, and I find that the "unexpected" and the "weird" also grabs them. If it overturns their assumptions or defies their understanding about how something "should" work it draws them in.

#### Online Forum Respondent #2-

I agree with the previous posts about students making something. We get the students to design and make a catapult in year 9 and have an interclass competition with a prize for the winning team. We also do the same for bridge building. The students are shown some images of catapults and then given questions to help them do their own research on the internet. They have to include their research in a prototype and build a mock up first then go back to the design phase and improve their design and say why they have made the changes. They have to include scientific ideas in their design based upon forces. They enjoy the research and the making, they hate the design part. We also decide upon the assessment criteria as a class to ensure that everyone knows where they can get their marks.

we get a high level of involvement from the students and we are able to use the project as a way of improving their internet research skills.

#### Online Forum Respondent #12-

Agree with above, esp[Online Forum Respondent #11]. In science it is good for the students to see something that makes them think.

In education and in museums like Te Papa, interactivity and engagement are vital in sparking and holding interest in a topic. What sorts of assignments have created the most engagement between your students and the science and technology fields?

We find that the students are engaged in Youtube. Also anything pictorial - so music and pictures would be good.

I don't feel they have to be fully involved, they know it is not a computer game, I don't think the expectations are the same.

Please note where the concept came from, if any of the assignment involved using the Internet (and to what degree), and the level of involvement of the students.

they like to listen to someone talk - there are a number of SHORT clips from scientists on line.

**2) Students today have grown up with technology and are considered “digital natives”, a term coined by Prensky (2001). What engagement between students and technology have you recognized? How effective is the Internet in providing interaction between the students and the subject(s) being taught?**

Online Forum Respondent #12-

So many times we are told that the students "know all" about computers and the internet. I do not find this to be the case. I would find it rather equal in proportion the %age of staff and students who are confident with their own device.

As a teacher I do expect them to use the internet, today I gave out a quiz and they had to actually speak to others and find out the answers, some looked them up.....

It is important I think for us to provide them with starting points of url for the right level of information. In our new Year 13 unit I have given them about 10 good sites/videos/youtube as for a current topic in bio there is a lot of information out there, and a lot of misinformation.

So in summary I think the internet is fab - but the students still can be helped by being steered.

Online Forum Respondent #7-

Engagement between students and technology - my experiences

In the past 12 months or so I have worked with three different groups of students ranging from 13yrs - 16yrs.

The low socio economic students (at risk youth) tended to have very little competence on the computer software programmes for creating work and tended to avoid producing anything on the computers. When surfing the net, a few (not many) were keen to look around but had little idea about the direction they took online.

The high decile intermediate students appeared to be competent on the internet but they needed to be taught how to be critical and it was challenging for teachers to let them go free for research.

I agree [Online Forum Respondent #12], direct links needed to be provided. I felt that it was often my job to find out the best sites and give these as part as a starting point for the students.

In terms of using the software to create work - they needed good lessons and activities that challenged them in many ways. A lineal, methodical instruction sheet is definitely not the way to go here. Most of these students learnt quickly from their mistakes and they were happy to share information/how to's with each other. This group had to visit a computer suite for their IT integrated lessons.

The third group are high decile that work in a school that has BYOD. They are experts at

downloading, finding the best gaming sites and fairly savvy with the ins and outs of their computer - ie control panel, changing the way it looks, installing software etc etc

#### Online Forum Respondent #8-

Students who are the most competent and confident internet users are those that have had the privilege to freely surf - so agree with [Online Forum Respondent #7].... there can be at times be a noticeable distinction between socio-economic groups, with English literacy as well as digital literacy likely to be playing a part here.

My students will use their mobile phone to quite frequently look up information. Our school is bringing in BYOD. Our current Y9 students, who have never used devices as part of their classroom lesson before have loved the interaction they are having through forums at school. A great way for more students to contribute to a discussion.

The internet is a useful and popular interactive tool. I find even if i have given students recommended websites to visit, they are still keen to search and explore for themselves. And they can get on to this quite quickly. As mentioned earlier .... we do need to help them develop the ability to become 'critical users' of the internet. Personally I think this needs to be learned explicitly rather than "on the job". As teachers we need to be more pro-active here.  
{Online Forum Respondent #2 liked this post}

#### Online Forum Respondent #11-

Completely agree with the previous posters. The use of the internet in class can be great, but there is also a lot of garbage out there and they need to be taught to think critically about that info. As a research tool, they definitely need guidance to start them off (especially so for the younger groups). They get better as they progress through the school, but you can still get quite a range of knowledge in a class about the use of the net and digital devices. We are not (yet) a BYOD school, but I am seeing more and more students bringing laptops, smartphones etc into the classroom and I am having some success improving engagement through their careful use. When they are used, I am trying to make "teaching moments" around thinking critically about what they have found.  
{Online Forum Respondent #2 liked this post}

#### Online Forum Respondent #4-

I frequently let the students explore online and use different programmes with their projects. The students are very good at sharing the knowledge that they know and it filters down through the class. As you know, we all learn better of our peers than an authoritative figure. The other students go over to the best one and ask how they found the assignment or created that look and then it spreads. I target my teaching at the top end, who in turn filter the task/knowledge down to other students. I then concentrate on the low end to get them up to speed.

I find struggling students are way more engaged if the picture and accompanying text is on a website that they had to look up themselves rather than a book. Saying that, they still need constant reminding to stay on task, no matter the form of medium being used.

#### Online Forum Respondent #2-

Students who have access to the internet at home are far more likely to be proficient users at school. I am still amazed at how many students have no idea how to use the internet for research or who do not understand the vocabulary that goes with it. For instance when I ask them to enter the URL quite a few of the students have no idea what I am talking about.

We do a lot of "Treasure hunts" using the internet and most of the students rely heavily upon Wikipedia for their answers and do not try other sites or do not know how to search other sites. I had one student arrive at school in year 9 from a digital classroom and he did not know how to work in a non digital class. He found writing in an exercise book difficult so I expected his computer skills to be good, but they were no better than the average student in the class. In fact his use of the internet was poor.

one problem with using the internet for interaction is that students often go to sites that use language they do not understand and this has a negative effect upon their interaction with the subject and they lose interest and find it even more difficult.

in my year 12 class I include YouTube clips to promote interaction and try to reach students with different learning styles.

#### Online Forum Respondent #6-

Seems to work best in small doses, rather than fixed to the screen for too long. Research skills definitely need development - few look beyond the top couple of hits on google or Wikipedia.

**3) What websites do you use regularly to gather content (information and media) for your lesson plans? What roles do museum database websites have in this gathering stage? Discuss what types of content you look for on these sites and what tends to be the most useful in the classroom. If the Internet isn't a major part in gathering content for your lesson plans, please elaborate on your main approach.**

#### Online Forum Respondent #7-

Big question - first ones that come to mind are Learning Hub. University of Utah, Youtube, Berkley uni, e-chalk, BBC education. I am not precious about these as Google will help out with all sorts of information from ed institutes all around the world. I am keen to hear what sites other teachers use.

I have mostly visited museum websites for Social Studies topics - information on wars/historical photos etc.

#### Online Forum Respondent #4-

These are the ones that come immediately to mind: [primaryresources.co.uk](http://primaryresources.co.uk), [discoveryeducation.com/teachers/](http://discoveryeducation.com/teachers/) for creating puzzles, youtube, [failblog.org](http://failblog.org) (hehe), TKI, ARB, Te Ara Encyclopedia of NZ, Christchurch Library/kids (great for disasters).

I can not remember using a museum website before joining this forum.  
{Online Forum Respondent #7 liked this post}

#### Online Forum Respondent #3-

Hi,

I go to the Science Learning Hub, TKI, BBC, Promethean Planet, Royal Society of NZ, University websites.

I don't regularly access Museum databases but I have used some resources e.g. Mataariki teacher resources from Te Papa.

I look for excellent, eye catching images, videos and interactives that clearly demonstrate a scientific concept or skill. I also search for content to beef up my own understanding and ideas for activities.

#### Online Forum Respondent #6-

TES, Science Learning Hub, TKI, BBC

Ideas for context/ application

Animations/ films/ GIFs that demonstrate ideas clearly

Interactive sites for BYOD classes

{Online Forum Respondent #8 liked this post}

#### Online Forum Respondent #8-

Uncanny, [Online Forum Respondent #6] has the sites that i was going to put. The Science Learning Hub for Y9 - 10 specifically and TKI for Y11 upwards but TKI does not provide content quite so much. BBC, Guardian are great for finding contemporary stuff. TES has some good resources and so does Science Upd8. Youtube is particulalry useful too. I would be less likely to go to a museum website unless they have a specific exhibit with accompanying resource - E.g Auckland Museum - 'My Ocean'. I have dipped into the UK's natural history museum and science museum for some great resources and ideas that help to develop and supplement a lesson plan or unit of work.

#### Online Forum Respondent #7-

Thanks [Online Forum Respondent #8], I have just been to the Science museum site in UK - great videos and activities!!! Also Upd8 - look s really interesting. Have you purchased a subscription? It is possible that I may do this - are there any others that you know of? I used to have access to 'e-chalk' which has some good games for the smart board and interactives across the curriculum. Another good site is 'teachit'.

#### Online Forum Respondent #8-

Hi [Online Forum Respondent #7]

Pleased they are helpful. No I have not purchased an Upd8 subscription. As a UK based resource the contexts would not quite hit the mark for NZ'ers.

Try the London Grid For Learning (forgot to mention that one!) - there are some GREAT resources for free but others you can only get by being a member.

Just so disappointing we are not developing such material for NZ. A question of money I guess.

#### Online Forum Respondent #2-

I use all of the above plus Museums in UK, not just Science museum in London. Bitesize by the BBC is really useful for revision. Just started using Smithsonian in USA. Chemed has useful



material for Level 2 Chemistry. Enchanted learning, Khan Academy, biology4kids, Ted Talks and the subject organisations are all worth looking into.

#### Online Forum Respondent #2-

I rarely use museums as their databases are not well advertised. I tend to only come across them by accident. I would like to use their resources to increase the number of examples I can expose the students to. The most useful resources I can use in the classroom are resources I can upload to our e-learning site, links to resources that the students can access at home and at school, power points I can use in class, quizzes, word finds, online tests, images, practical investigation suggestions, and Another useful website is Exploratorium.edu which has a good step by step eye dissection.

**4) Explain your ideal resource website experience. What features of the website would make searching, compiling and saving resources easier? Would you rather the focus of the website content be on information for development of lectures or supplementary interactive materials that aid in explanation of key concepts? Please explain.**

#### Online Forum Respondent #7-

An ideal resource website experience would be..

Content of website evident on the home page-so I am not wasting my time looking for something that isn't there e.g. a particular topic or science concept

The pathway to that content would be simple and clear - easy navigation and no surprises

Information/resources sorted in different ways - eg a section on topics that contain a range of resources to support the topic as well as a section based on resource type that could be easily scanned for a specific topic

So if I wanted to write a unit on forces, I could go to the topics and look for something related to forces (eg bridges) or I could go to the media clips and find a couple of short clips that depicted forces. This way, one resource might be found under different sections.

Good search engines

Lots of resources to choose from - all quality (once you see the website has one or two poor resources, you tend to move onto another site)

Good pics to use on the Smart board - close ups depicting detail or multiple pics of one thing

Suggested teaching activities - good to inspire teachers for ideas - ones that develop students creative thinking or provide good hands-on activities

{Online Forum Respondent #4 liked this post}

#### Online Forum Respondent #4-

Supplementary interactive materials that aid in explanation of key concepts delivered at different learning levels.

Everything [Online Forum Respondent #7] said, plus tags and suggested tags on topics so that you can widely explore related resources. I really like the search engine on the ARB website that gives a brief explanation next to each resource so you know if it is relevant.

Online Forum Respondent #7-  
ps- ads on a website are not good in any form

Online Forum Respondent #3-  
Hi,

Some really good points have been made already. i would also like curriculum-linked (NZ) resources, particularly those that make the Nature of Science explicit and provide hands-on activities that teachers can easily access resources for.

Online Forum Respondent #12-  
Agree with above, except have no experience of smartboards 😊 In the senior area if a particular resource was great for a particular Achievement standard or two then that could be tagged too.

Online Forum Respondent #8-  
A website for teachers that links specifically to the NZ curriculum or NCEA would make homing on specific resources incredibly easy.  
For example L2 Earth & Space Sciences - organisms that can survive in extreme environments... then resources relating to this standard  
Also, being able to identify key ideas/concepts/principles would be very useful. Check out how resources have been made more readily 'searchable' here:  
[scienceonline.tki.org.nz/Introducing-five-science-capabilities](http://scienceonline.tki.org.nz/Introducing-five-science-capabilities)

As teachers we are perhaps moving away from the more traditional lecturing approach. Your suggestion of interactive or short tutorials that students can view either with or without a teacher being present would be quite powerful

Online Forum Respondent #7-  
I agree with Online Forum Respondent #3 - Nature of Science or Scientific Skill development is very helpful. If there are activities/lesson guides that highlight the development of certain skills as well as knowledge development, this would cover some of the Nature of Science strand.

Online Forum Respondent #11-  
Doesn't seem much more to add! I agree with all of the above. Clearly layed out with links to curriculum levels and Achievement standards (where appropriate). Good search tool.  
Information tagged so it can be grouped in different ways. I prefer (good) supplementary material - animations, clips, any "hooks" that get them thinking and engaged

Online Forum Respondent #2-

Some good suggestions already. Only thing to add is a website that is separated in the different year groups and strands of the NZC. Links should be easy to follow and user friendly. Links to external resources would be goods. Maybe somewhere we can download files or share resources would be useful. An online forum for students to ask an expert a question would be beneficial too

**5) The following is a list of some ideas we have for Te Papa to improve its Collections Online (CoL):**

- Improve Advanced Search Feature**
- Add Related Links to External websites**
- Improve information on existing items within CoL**
- Increase percentage of Te Papa's collection displayed online**
- Improve Social Media Sharing**
- Create Downloadable PowerPoints and Word Documents**
- Enable Tagging (either by the museum or by the user)**
- Add More Short Informational Videos on various topics**
- Develop Lesson Plan Templates**
- Develop Full Lesson Plans**

**Please prioritize these ideas in order of importance to you (1 being lowest, 10 highest) when trying to use a website as a resource.**

**There should be a different number associated to each idea.**

**If you want to explore CoL, it is located at [collections.tepapa.govt.nz/](http://collections.tepapa.govt.nz/).**

Online Forum Respondent #12-

- 5Improve Advanced Search Feature
- 4Add Related Links to External websites
- 6Improve information on existing items within CoL
- 9Increase percentage of Te Papa's collection displayed online
- 7Improve Social Media Sharing
- 8Create Downloadable PowerPoints and Word Documents
- 3Enable Tagging (either by the museum or by the user)
- 10Add More Short Informational Videos on various topics, this is the best
- 1Develop Lesson Plan Templates , this is the least, for a younger teacher this might be a lot higher??
- 2Develop Full Lesson Plans

Online Forum Respondent #6-

- 10 Add More Short Informational Videos on various topics - short, punchy, can lead into further research
- 9 Improve Advanced Search Feature - no point having it there if nobody can find it
- 8 Create Downloadable PowerPoints and Word Documents - resources that can be used within class or as homework/ extension activities
- 7 Improve information on existing items within CoL - facilitate further (deeper) inquiry
- 6 Add Related Links to External websites - facilitate further (broader) inquiry

- 5 Increase percentage of Te Papa's collection displayed online
- 4 Enable Tagging (either by the museum or by the user)
- 3 Develop Lesson Plan Templates - teachers should be able to do this themselves?!?
- 2 Develop Full Lesson Plans - I do NOT want to be spoon-fed, just give me bits that I can embed in my own lessons
- 1 Improve Social Media Sharing

Online Forum Respondent #8-

- 10 Improve Advanced Search Feature
- 3 Add Related Links to External websites
- 1 Improve information on existing items within CoL
- 2 Increase percentage of Te Papa's collection displayed online
- 8 Improve Social Media Sharing
- 6 Create Downloadable PowerPoints and Word Documents
- 9 Enable Tagging (either by the museum or by the user)
- 4 Add More Short Informational Videos on various topics
- 5 Develop Lesson Plan Templates
- 7 Develop Full Lesson Plans

Just a thought. I was interested in marine mammals. Have Project Jonnah coming to visit the school to do a marine mammal medic course. Looked at the museum collections and very limited. There is so much that could be done to improve this collection and inspire students. Perhaps each collection needs some sort of a 'framework'. Some background about the curator - video of them introducing themselves. Something about taxonomy with structure being related to function (adaptations). Some NZ story about biodiversity, human impacts, interesting behaviors. Perhaps not the best place for this comment but just throwing it in!!!

Online Forum Respondent #7-

- Improve Advanced Search Feature
- Add More Short Informational Videos on various topics
- Create Downloadable PowerPoints and Word Documents
- Improve information on existing items within CoL
- Increase percentage of Te Papa's collection displayed online
- Enable Tagging (either by the museum or by the user)
- Develop Lesson Plan Templates
- Develop Full Lesson Plans
- Add Related Links to External websites
- Improve Social Media Sharing

Online Forum Respondent #11-

- 7 Improve Advanced Search Feature
- 2 Add Related Links to External websites
- 5 Improve information on existing items within CoL
- 6 Increase percentage of Te Papa's collection displayed online
- 8 Improve Social Media Sharing
- 1 Create Downloadable PowerPoints and Word Documents

- 3 Enable Tagging (either by the museum or by the user)
- 4 Add More Short Informational Videos on various topics
- 9 Develop Lesson Plan Templates
- 10 Develop Full Lesson Plans

Also, it needs to be better "advertised" to schools. I had hardly been to the site prior to the invite to take part in this group. None of my colleagues had ever visited the site

Online Forum Respondent #8-

Hi there, just a few more thoughts on improvements and i may have made a couple of these comments already - sorry!

I'm thinking about the biological collections here...

I think each collection needs to follow a 'framework', a consistent format for each collection. So that the visitor to the website can become more familiar with it and this I believe will make it easier to use.

Perhaps the visitor could have 'an account' and be able to save items and information from the collections that most interest them. Effectively creating their own personal collection.

Maybe a 'theme' where students venture into a particular virtual habitat and learn the methods scientist use to collect specimens. They could collect specimens throughout their journey from different habitats.

In terms of interactivity and visitor participation, perhaps users could upload pictures of their own 'specimens' and people could leave comments. I think that this could be potentially very cool to get some discussion going and for a curator to be able to give feedback.

A chance for people to contribute to the collections, where relevant, with anecdotal stories. For most young people they like to be able to contribute, even if its just 'liking' something!

In terms of the collections being more useful - perhaps there could be opportunities for teachers to work with collection managers to develop a specific collection resource. So for example an NCEA L2 Biology standard that explores different functional groups - say types of feeding (bulk feeder, filter feeder etc)

Perhaps do a little but do it well or make a more specific area for primary/secondary students to visit.

I think its important that the collection is not just a one-way delivery of content.

Online Forum Respondent #2-

- 9. Improve Advanced Search Feature
- 5. Add Related Links to External websites
- 10. Improve information on existing items within CoL
- 6. Increase percentage of Te Papa's collection displayed online
- 4. Improve Social Media Sharing
- 8. Create Downloadable PowerPoints and Word Documents
- 3. Enable Tagging (either by the museum or by the user)
- 7. Add More Short Informational Videos on various topics
- 2. Develop Lesson Plan Templates
- 1. Develop Full Lesson Plans

**Personal Messages**

ADMIN- Hi [Online Forum Respondent #8],

we would like to clarify your ranking of resources in the thread "Prioritization of Improvements for Te Papa".

Your additional comments were extremely interesting, but you mention:

Improve information on existing items within CoL and

Increase percentage of Te Papa's collection displayed online as the two lowest priorities (1 and 2 out of 10)

We appreciate your insightful comments and would like to use them in our report, so we want to make sure you are accurately portrayed on your views.

Cheers!

The Te Papa Team

Online Forum Respondent #8-

Hi Team

Of course I will do this again, there does appear to be a lack of joined up thinking and its good (important!) to reflect and come back to this stuff.

2 Improve Advanced Search Feature - not too sure how this will be used in a school setting, I put some sp. names in but got blanks.

8 Add Related Links to External websites - yes to help with student research and give NZ contexts

10 Improve information on existing items within CoL - Yes please

1 Increase percentage of Te Papa's collection displayed online

7 Improve Social Media Sharing

4 Create Downloadable PowerPoints and Word Documents

6 Enable Tagging (either by the museum or by the user)

9 Add More Short Informational Videos on various topics

3 Develop Lesson Plan Templates

5 Develop Full Lesson Plans

Ok, so top is 10,9, 8 = providing more information (fundamental)

7, 6 = participation (highly desirable for interactivity)

5 = lesson plans, this would give educators ideas and allow students to find out and learn from areas where the collections hold more information. So would help ensure positive outcomes.

4, not sure what the advantage to this might be. Allowing teachers and students the chance to remix content?

3 = not sure what the template would look like, so difficult to rate.

2+1 = Perhaps need some more guidance to use this search facility for students. Obviously the more content the more likely students will find what they are looking for - IF this is their objective. Speaking from a students/teachers perspective, I can't necessarily see the point of adding tons of content when there is not engaging information to go with it.

Not exactly a quick reply but hopefully more helpful. Look how much i have changed my mind!  
Yikes.

### **Survey Comments and Link**

#### ADMIN-

Any comments about the survey (structure, format, content, etc) should be posted here.  
The survey can be found by clicking the following link: [Click Here to take the Survey](#)

Thanks!

#### Online Forum Respondent #11-

Survey was quick to complete, but I felt it was geared towards me being very familiar with the Te Papa Online collection, which I haven't spent much time on

#### Online Forum Respondent #3-

Hi there,

I agree, the survey was a good length, but there were questions that were not really valid as I had not used the Te Papa Collection. Are you able to post the survey questions as I can't remember all and I can not access it again?

Regards,

[Online Forum Respondent #3]

#### Online Forum Respondent #8-

Hello

I have only really 'dipped' into the collection. I think I would really need to 'swim around' in it for longer to give you some more valuable and informative feedback.

#### Online Forum Respondent #2-

I agree with previous comments. I would like to add that the question on year levels did not enable us to enter more than one level. I assume that other people teach multiple year levels at their schools. For instance I teach from year 7 to 13. I have also never used the online collections.

# Appendix B: Online Survey

**WPI Collections Online Survey**

Thank you for taking part in our survey working to improve Collections Online. This survey is being conducted by a group of university students in conjunction with the Museum of New Zealand Te Papa Tongarewa. Please answer the following questions for each post to the best of your ability.

This survey is voluntary and may be stopped at any time. No personal data will be gathered and none of the information will be attached to the respondent; all answers will be kept anonymous.

This survey will take approximately 4-8 minutes.

**1. What is your gender?**

Male

Female

**2. In what year were you born?**

**3. Where do you live?**

**4. Please rate your satisfaction with the following qualities of Collections Online:**

	1 (Very Dissatisfied)	2	3 (No Opinion)	4	5 (Very Satisfied)	N/A
Pictures of collection items	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Item descriptions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biographical information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informational videos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grouping of objects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Links to related topics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blog feed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Search bar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advanced search function	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**5. [OPTIONAL] What one aspect of the site were you very satisfied with?**

**6. [OPTIONAL] What one aspect of the site were you very dissatisfied with?**



## WPI Collections Online Survey

### 7. How does Collections Online compare to other museum database websites?

- 1 (Much worse)    2 (Worse)    3 (About the Same)    4 (Better)    5 (Much Better)    Unsure

### \*8. What was your reason for visiting Collections Online today?

- Professional  
 Educator/Teacher  
 Student  
 Personal/Community  
 Interest/Fun  
 About Te Papa  
 Other (please specify)

**\*9. Which schooling level do you primarily teach?**

- Less than 8
- 8
- 9
- 10
- 11
- Higher than 11

**\*10. What sort of local area do you teach in?**

- Rural area with a population of less than 2,000
- Provincial Town
- Provincial City
- Metropolitan City (Akl, Ham, Wlg, Chc, Dnd)

**\*11. What one primary subject and what other subjects do you teach?**

	Primary (one only)	Other
English	<input type="radio"/>	<input type="radio"/>
Arts and Music	<input type="radio"/>	<input type="radio"/>
Health and Physical Education	<input type="radio"/>	<input type="radio"/>
Languages	<input type="radio"/>	<input type="radio"/>
Mathematics and Statistics	<input type="radio"/>	<input type="radio"/>
Science	<input type="radio"/>	<input type="radio"/>
Social Science	<input type="radio"/>	<input type="radio"/>
Technology	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>

If Other, please specify

## WPI Collections Online Survey

The following questions will help us better understand how to present information based on technological availability.

### 12. Which of the following technology resources do you have available and use in your classroom? [Check all that apply]

- Computer
- Mobile Tablet
- Smartphone
- Projector
- Smartboard
- Other

If other, please specify:

### 13. Which of the following technology resources do your students have available to them and use at your school? [Check all that apply]

- Computer
- Mobile Tablet
- Smartphone
- Projector
- Smartboard
- Other

If other, please specify:

### \*14. Does your school offer wireless internet access (Wi-Fi)?

- Yes
- No
- Unsure

## WPI Collections Online Survey

The following questions will help us determine how Collections Online could help improve and supplement your lesson plans.

### 15. What type of interactive assignments do you currently implement in your curriculum? [Check all that apply]

- In class group activities
- Out of class group projects
- Online quizzes
- Educational computer games
- Other (please specify)

### 16. Rate the importance of each resource when developing a lesson plan.

	1 (Nonessential)	2	3 (No Opinion)	4	5 (Essential)	Unsure
Developed Lesson Plans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lesson Plan Templates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PowerPoint Presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Word Documents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PDF Files	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Articles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Videos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pictures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Textbooks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encyclopaedias	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 17. [OPTIONAL] If you use any other resources regularly when constructing a lesson plan, please describe them below.

## WPI Collections Online Survey

The following questions regard your use of Collections Online.

**\*18. How do you currently save information from online databases? [Check all that apply]**

- I do not save information
- Browser Bookmarks
- Social Media Sharing
- Emailing a Link
- Downloading the File or Webpage
- Other (please specify)

**19. [OPTIONAL] What would you like to see added to Collections Online to make resources easier to prepare when developing a lesson plan?**

## WPI Collections Online Survey

Thank you for your input regarding your satisfaction of Collections Online. Your responses will be used to improve the website, its resources, and its tools.

**20. [OPTIONAL] If you have any other comments regarding the survey, Collections Online, or Te Papa in general, please tell us below.**

## Appendix C: Interview Agendas

### Smithsonian Teleconference Agenda

Attendees: WPI Students: Evan Briggs, Michael Day, Benjamin Rude, Ryan Thornhill  
Te Papa Staff: Philip Edgar, Adrian Kingston, Claudia Orange, Stephen Owen  
SCLDA: Darren Milligan, Michelle K. Smith, Melissa Wadman, Ashley Naranjo

#### Introduction

#### Teacher vs. Student Perspectives

- You started out looking from the teacher's perspective, but noticed that the focus should be on the student's engagement and interaction with the website. How did you incorporate this into the teacher's needs?
- What folksonomies or tagging did teachers find the most useful for searching?  
Collaborative vs. Pre-set?

#### Capabilities for interactive classroom experience

- What resources and staff do you have available for the project?
- What difficulties did you encounter when implementing student and teacher accounts?  
What are the capabilities of each?
- Have you looked into creating a mobile device app for the toolkit?

#### Compare Methodologies

- Our methodology for our project consists of surveying educators and their use of Te Papa's Collections Online, having an online discussion board to communicate with teachers throughout New Zealand regarding teaching methods, and contacting museums to see what methods have yielded the best results. Do you have any suggestions regarding our approach?
- Which did you find the most useful for gathering data? Open response, prompt, multiple choice, or 1-10 ranking scale?

#### Prototype Site

- We noticed that the prototype site is currently closed to the public. Does that mean that there have been improvements made to the site? Are there plans for the release of an official site in the future?

## Skype Conference Agenda: Sebastian Chan & New Zealand Museum Te Papa Tongarewa

Attendees: WPI Students: Evan Briggs, Michael Day, Ben Rude, Ryan Thornhill  
Te Papa Staff: Phil Edgar, Stephen Owens  
Sebastian Chan

### Introduction

Explanation of WPI - Te Papa Project

Work with Cooper-Hewitt

- What led you and Cooper-Hewitt to look into tagging by colors? Do you think non-traditional tagging (no “words”) can be helpful?

Work with Powerhouse Museum

- What was your role in the Commons Flickr project?

Teacher vs. Student vs. Visitor Perspectives

- How did you incorporate the users into approaching issues of interactivity, collaboration, and education?
- What folksonomy/tagging methods have you seen to be the most useful? Collaborative with visitors? Preset with suggestions?

Capabilities for Interactive Classroom Experience

- Could you tell us about your views on the importance of user accounts?
- Did you have a part in the development of mobile apps? What is your thought on them as educational tools (inside and outside the classroom)?

Methodology

- What methodology did you use to approach the problem of museum outreach, awareness, and role in society with the rise of the Internet? Did you do a literature review, surveys, or come to your own conclusions?

Other Questions

- What is the most important attribute or focus of a museum collection website to make it valuable from an educator/educational/visitor standpoint?
- What resources and technologies do you see as the most important in regards to accessibility and educational value of museum collection websites?
- What is your experience with inter-museum collaboration? Positive/Negative, importance, outcomes.



## Appendix D: Comparing Existing Models

	Museums Features	OLD CoL	MOMA	Powerhouse	British	SCLDA	Smithsonian	Cooper Hewitt	NEW CoL
Casual	Pictures	✓	✓	✓	✓	✓	✓	✓	✓
	Item Description	✓	✓	★	✓	✓	✓	✓	✓
	Biographical Info	✓	★	✓			✓		✓
	Videos	✓	★		✓		✓		✓
	Grouping	✓	✓	✓	✓	✓	✓	★	✓
	Related Links	✓	✓	✓	★		✓	✓	✓
	Random Function	★						✓	
	Search	✓	✓	✓	✓		✓	✓	✓
Actively Engaged	Advanced Search	★	✓		✓		✓	✓	★
	PowerPoints		★			✓			
	Lesson Plan		✓			★	✓		
	Blog	✓	✓		✓		✓	★	✓
Proactive	Social Media	✓	✓			✓	✓	✓	★
	Community Collab		✓			★			
	Comment Section					★	✓		
	User Account		✓			★		✓	
	Collaborative Tags		✓	★			✓		

	Museums Features	OLD CoL	MOMA	Powerhouse	British	SCLDA	Smithsonian	Cooper Hewitt	NEW CoL
Common	Pictures	✓	✓	✓	✓	✓	✓	✓	✓
	Item Description	✓	✓	★	✓	✓	✓	✓	✓
	Biographical Info	✓	★	✓			✓		✓
	Search	✓	✓	✓	✓		✓	✓	✓
Supplement Content	Videos	✓	★		✓		✓		✓
	Grouping	✓	✓	✓	✓	✓	✓	★	✓
	Related Links	✓	✓	✓	★		✓	✓	✓
	Blog	✓	✓		✓		✓	★	✓
	Random Function	★						✓	
	Social Media	✓	✓			✓	✓	✓	★
	Advanced Search	★	✓		✓		✓	✓	★
Create Content	User Account		✓			★		✓	
	Collaborative Tags		✓	★		✓	✓		
	Lesson Plan		✓			★	✓		
	PowerPoints		★			✓			
	Community Collab		✓			★			
	Comment Section					★	✓		

## Appendix E: Sebastian Chan Transcription

M: Why did you move to Cooper Hewitt?

S: I think really it was the opportunity to start off with a blank slate and build a lot of the stuff that I think Powerhouse was in the process trying to figure out how to do but was hampered by having an old building and some of the challenges with retrofitting the whole place at once it just wasn't going to occur at powerhouse. The opportunity to do that here at Cooper-Hewitt was kind of unique and also at the time Bill Moggridge was director. Bill was one of the founders of IDEO. The opportunity to work with him from a user centered design perspective was kind of unique, and super exciting. Unfortunately Bill died in late 2012 unexpectedly.

M: Looking at what Cooper-Hewitt's site, color tagging stood out to us. Non-traditional tagging, other applications for tagging.

S: One of the things we learned at powerhouse was ... really that... museums suffer from a browse problem rather than a search problem. I think we worked through the search issues pretty well at the powerhouse and at many other museums too: we've kind of figured out the limits of search. And at the same time one of the things in exploring the collections here at cooper Hewitt was the poor level of documentation we had here.

So one of the challenges when you don't have a real good documentation is you have to find other ways to describe things. And because so little of the collection here had actually been digitized or even well catalogued, we had to come up with some other approaches and that freed us to think of things kind of differently. And I think the big success here has been to refocus the efforts almost entirely on browse versus search. That opens up the collections in terms of access in many other ways too and we're thinking of lots of other ways of exploring that. That also fell out of the redesign of the physical museum itself.

We had the chance to not do things the way people had done them previously, physically, so that's kind of how it worked. I think there's a lot of other option for automated tagging like this color thing. The algorithmic analysis method of objects is kind of interesting. Color is one thing you can do, you can do pattern, line, shape all of those things too. We did try that and other stuff at powerhouse too, we did some of the first work too that's public there around using OpenCalais and those sort of text-mining tools to pull out keywords and meaning from blobs of text. [in that sense] The color stuff is a little bit like the OpenCalais stuff we were doing in 2007/8 at powerhouse.

M: We found the color tagging really unique and drew us in.

S: The color stuff has been the preferred method of navigation at the moment. Random and Color dominate search by a huge amount. People prefer to navigate using those means.

M: Experience at powerhouse museum. You were active in digital license of photos and use in the commons project in flickr. How did that come about, how the museum decided to move in that direction, and what was your role?

S: So my team made that happen. Paula Bray was one of my team of managers, so both at Cooper-Hewitt and in those last years at the powerhouse I was in a senior position reporting to the director, so I was able to make policy decisions around this sort of stuff. Paula, who was my digitization and image manager, she operationalized it, but basically we became aware that flickr was doing the Commons. I was speaking at a conference in Sydney, as was George Oates from Flickr in 2008. We had a chat about tagging then, and she mentioned to me that the Commons was coming with the library of congress. I said to her, “let’s be the first museum in the world to do the same, what do we need to do?” From there, there was a bunch of policy decisions that had to be made. But I think the Commons worked out really well, and then Paula turned it into something that was sustainable, and then there was a whole bunch of stuff around storytelling, and the drip-feed release of images at that time. So Paula’s team was in charge of the curation and selection of all those things.

M: It seems it worked incredibly well

S: Yeah, I mean, it did for a while. I think these things have a lifespan and I think Flickr’s changed over the years too and the audience of Flickr has changed and I think there are other ways to do the same thing. I think what that project was really about was the museum taking a stance on materials that had expired in terms of copyright and saying “anything before this date IS public domain: let’s get it out there”. If we zoom out of the particular Flickr bit, we can say really the change was to assert that anything in that time in terms of photographs pre1955 in Australia was out of copyright in terms of photography., and let’s get it out, certainly pre-1923. It was more about the policy. What you see is more than the policy, but what is portable is the policy bit which is asserting when things have expired.

Ryan: What were the challenges you faced involved beyond physical implementation of digitizing all the information?

S: Fortunately under Paula was the Image Sales team. Paula was in charge of making revenue from selling those images. And because she reported to me, I was able to say, “I’m willing to take the risk that if we give these images away, I am willing to risk losing that revenue stream.” If Paula had been in a different department or different branch of the organization that would have been much harder to do. But because image sales and image licensing were in the same team, and Digital was the umbrella branch above that, we were able to make that choice. And wear the consequences if they had been negative.

Of course in terms of doing the right stuff, we had to be sure of the dates. A lot of those materials had been poorly catalogued and thus we weren’t sure of dates necessarily, so there was some research into that. There was some stuff around privacy and people in the photos. There’s a whole bunch of indigenous materials that were in those same

photographic collections that we didn't release for reasons of important Indigenous concerns around identity and reuse. Even though those same images were technically out of copyright, we felt a duty of care towards the misuse of those images that we kept them out.

So there are all those choices that had to unite and I think that having the ability to do that and to understand some of the nuance around that was important: the Indigenous stuff was a good example of the nuance.

M: In moving the accessibility of the museum beyond its physical location, how were you taking into account the people who used it. Were you surveying, team meetings, etc.?

S: We did a mix of ad-hoc user-research, formal evaluation, and research projects. I think what happened which unexpectedly surprised us was ... All this stuff around the collection (Powerhouse) went live in 2007, we were building it in 2006, and we just took a punt: we didn't know. And it was wildly successful beyond what we had expected it would have been, and it CHANGED the audience makeup. Even if we had done formative evaluation work beforehand, formative research, pre-project research, or user research beforehand, we would not have actually surveyed the right users or potential users, because we just didn't know. And I think that was a lesson we learned pretty fast was "OMG, we really don't think about all these other potential users who might be interested beyond the traditional museum users who use our stuff now".

It's been the same at Cooper-Hewitt in that we have massively increased the access to our collection, but we've broadened the types of people who use it. As we've broadened the types of people who use it, all those types of users have different needs and different wants and sometimes non-compatible wants as well. And that's been something we've always struggled with.

Certainly the case at the powerhouse, as we broadened use of the collection, we had a lot of people using the collection on our website, who didn't really understand they were looking at a museum website at all, and didn't understand why our curatorial staff didn't answer their inquiries immediately, and all those things. And I think we were poorly equipped to cope with the greatly broadened access. That's not to say we shouldn't have done it, but it was certainly one of those things that was too successful maybe?... I don't know... it's one of those things I think that taking a stab in the dark a long time ago, 2007, was actually probably a good thing because it treated all these issues in the museum of the whole. That said nowadays I'm much more aware of trying to launch things a little bit at a time, stretch them out, and do a lot of quantitative and qualitative evaluation as we go, and have ways of identifying new user groups quickly so we can target research towards them.

It's a bit easier here [Cooper-Hewitt] because we have a much narrower and smaller collection than Powerhouse. Powerhouse had an incredibly broad collection, so anytime we launched anything, the breadth of the collection meant that we would get a lot of different types of users that really the museum couldn't ever have expected to cope with.

Teachers and students, two reports I sent you. The first report looks particularly at the use of museum collections including the powerhouse collection by teachers within

the curriculum. The second one is tracking teachers and school kid's use within schools across the collection from a subset of schools and sort of looking at what got used, how it got used.

What was incredibly unexpected was that a lot of the things we previously designed for just didn't play out. And that was the same not only across the collection but across a lot of the educational games and other things we built at the powerhouse too, and mobile apps and all this sort of stuff too. People use things in their own way.

M: Taxonomy vs. Folksonomy. Effectiveness and limitation of both approaches.

S: I think it depends on the context and museum collection type. One of the things that folksonomies are very good for are for when things are catalogue'd in weird ways: I'm talking about art museums particularly. Cataloguers and curatorial staff in art museums might have a painting of the dog, but the painting isn't called "dog", and the description the curator writes doesn't talk about the dog at all. That's where you can see subject based classification being extremely valuable because the teacher or the user is just looking for a painting of a dog, and if it's not described as a dog then you're never going to find it. SO there is certainly a value there. But I don't think it's been realized more broadly than that really. I think there was a lot of hope that it would work well, and it certainly works well for defined collections, narrowly defined collections where there's a reasonably narrow, passionate user group who will use it and care about it in the community. This works well with historic photos by place or event. So if photos of a particular event or place, people will come and bother to tag, and the tags will be reasonably common, I guess, or reasonably consistent.

The challenge we found at the powerhouse was we had such a broad collection, that the value of the tagging was incredibly reduced, because people would approach it completely differently. And interestingly, we started to pull in the tags from flickr. And the tags we pulled in from flickr for the things that we put into the flickr commons were far more valuable within that photoset than actually the tags that were added on our own website for exactly the same photos. So it's about context, and consistency of community I guess. So where those two things exist, you can get pretty good results with tagging, but with a general collection it's not so great, and there are better ways. These are things that a lot of people are trying to work through. I think, even as early as 2008 I think, there was a famous quip that tag clouds were kind of the mullets of the Internet, and I don't think they've recovered from that.

M: Moving towards interactive nature of websites, what are your opinions on user accounts? Many museums seem split. What is your view on user accounts on what they can add to an experience?

S: We're doing user accounts here at CH in the new museum. But I think the challenge with user accounts is that unless you have a cohort of users that come to your site regularly, why do they need an account? And that's the challenge. Here at CH, we are connecting the tickets to the user account. When you visit the museum physically, your ticket will have your account on it. You don't have to set up an account basically; it's set up through the purchase of the ticket, and then the use of the ticket of that ticket in the

future. And then you can aggregate multiple tickets and visits into one once your account is set up. We're really trying to remove that sense of the burden of having to think that you will return to the site. User accounts are a challenge of "what's the value to the user of having a user account". I think museums have done it reasonably well. The Dallas museum of art with their DMA Friends is a good example of that. They treat user accounts much like reward points, you know, you get value for doing things, and that value is able to be redeemed in tangible ways. Other places that set up user accounts to just download stuff it's completely inane. It only seems to benefit the museum, and not the user.

Other places, MONA in Tasmania. When you visit MONA, the iPod touch you get basically creates a user account with your email address, and then you get sent all the things that you saw. So those uses are valuable because they give something back to the visitor, but generally I've seen user accounts done pretty poorly within museums. SO I think the best way, in my mind, is to integrate that so it is seamless in setup. If you just have a user account for the website, it doesn't really work.

M: Development of Mobile applications. What part do you have in that, and what is your thought on them as educational tools inside and outside of the classroom.

S: My team's designed and built a bunch of those and commissioned a bunch of those too. Each of had pretty specific purposes. Some were designed specifically to use in the museum, some were designed to work between the museum the museum and outside in the world, and some were just designed to work out in the world too like city tours, and some of the early Augmented Reality stuff we were doing too. I think we were in the early days we even did QR codes in 2007/8. We were doing a lot of stuff because it was new and we were doing a lot of stuff to try out stuff and to figure out what worked and what didn't. We saw a potential to extend the museum beyond the walls of the museum and we saw a potential for mobile to do that. We also saw new opportunities for engagement with the collection in the context of the outside world. We did some stuff in the gallery too around mobile exhibition catalogues, mobile apps for exhibitions, audio guides, multimedia guide replicas, that sort of stuff. I think there's still a lot of potential there, but I think what's happened now I think is that it's no longer novel: you don't get any points for doing one. Actually if you do one, your biggest challenge is getting anyone to care, because it's no longer something special. So, you know, again, I would look at who are the intended users, what value can you actually create for them through a mobile app or whatever you're trying to do. And then figure out how you're going to get that mobile app or that product in front of that target user group.

We're not doing mobile app for the new museum here in the CW. There isn't a mobile app: there is a responsive website and everything is being built to use the affordances of mobile and to build on the expectation that every visitor will have a smartphone of some sort, but we're NOT working on the notion that there is something special about that. We're trying to design for a world where those are everywhere.

M: How can a museum maintain a the perspective and viewpoint of moving experience towards the users, building with them and not marketing towards them, etc.

S: We've done a lot of stuff working with others, particularly because that seems to be much more rare here than in Australia. In Australia and NZ there is a much more culture of collaboration, partially driven by the funding model of government. In America funding is private and competitive, so institutions don't collaborate. But here [CH], I've been trying to drive an agenda of collaboration, both with non-profits and commercial services.

But I think around the first part, getting digital the center, has been really about the organization structure required to support that. That digital is not an add-on thing, that the web is not an add-on things. It is now just part of everyday life. And museums need to get better at understanding that the web is everywhere, the web is in visitors' pockets, we can't expect anything to be different around that. I think that's one of the things, being a shift in the last 3-4 years, that that is now what people are calling "the new normal". So we're really just trying to design for the New Normal, which is ubiquitous Internet, and the differences being around not ACCESS but literacies of use. So the challenge for minority audiences or non-traditional museum audiences, or however you want to call it. (In America we call it "diverse audiences", which I find very polite and obtuse). In designing for these audiences it's no longer about access, it's about literacy, about ability to use digital products effectively, not simply access digital products. So that's sort of the things So you know, designing buildings and exhibits to be smarter, and be aware of that, designing experiences for visitors that are more seamless and don't require them to do things like create accounts. One of the things we just launched the other day is the ability to take a photo of a label in a museum and get it immediately with optical character recognition, jump immediately to its collection record on your phone, without having to log into a website, or use a QR code, or whatever. This is OCR made easy and simple. This is the new normal. You shouldn't have to use short codes or urls you should just be able to send an email or MMS a photo to the museum and it pings it back to you with whatever. That sort of thing – trying to look for the places where we can remove the effort from the user experience around that stuff. And to not really make a big deal about this. I think one of the things I was explaining to my director the other day. She came to me and she was like "Seb, Seb, what are the things you got coming up. What are these new exciting things you got coming up?" And I had to say to her, "Look actually, a lot of the things we're doing, we don't really think are really exciting, we just think they're what everybody would expect. And maybe they're not things other museums have done, but they're certainly things I can go out and experience in the world, and they don't feel special".

When subway stations in New York have big interactive screens that help you navigate from one part of the city to another, suddenly those big interactive maps and tables you have in the museum itself look kind of crap, because those screens are everywhere now. So that sort of thing like, the technology itself isn't remarkable now, it's all about seeing well designed user experiences, and to try and make the technology fade away a little bit, and to foreground new forms of visitor experience and then focus the marketing and focus the visitor services stuff on building visitor literacy around how to use the museum better: how to use the museum to fulfill their needs as citizens or as part of a particular community better to make the museum meaningful to them BECAUSE it can now do all these things, but not because those things are somewhat remarkable. They may feel remarkable, but they shouldn't feel remarkable. This is, as I say, "In 5 years time, none of



this stuff will look remarkable.” A lot of the stuff we did 5 years ago feels kind of like “oh well, yeah. We did it then, so what? It’s everywhere now.” But is SHOULD actually be everywhere now. That’s what it’s about. Does that make sense?

R: What would be the best way for teachers to use the site interactively. Enabling the technology? Should we bring tools to them expecting to teach them how to do it, or that they can teach themselves?

S: I think it’s a mix of that. One of those things I just sent you from 2009 was where three museums (Powerhouse, National Museum of Australia, and Museum Victoria) each put about 400 objects from their collections into the national lesson plan portal equivalent for Australia, and then it tracked what teachers actually did with that. It had access to all these objects, which had also been catalogued with education metadata. So curriculum matchers, and keywords for particular subjects and learning outcomes and all of that. So 400 objects per museum, and we re-catalogued those so they would match particular subjects and could be found within this lesson plan making system. We also cleared the rights to enable teachers to use those without fear of whatever.

One of the things that was fascinating about that was when you read that report, out of the 1200 or so things in there, only a very small percentage were actually used. And interestingly some of the things that were particularly marked or classified as relevant for particular subjects were not actually used in that subject at all but were used in another subject all together so for example one of the objects was ----

STATIC

----that had been tagged; it was a gold mining cradle, like, for sorting gold in a stream. And so that gold mining cradle at the powerhouse we had tagged with “the gold rush” and all that sort of stuff for the Social Studies curriculum. Yet it was interesting to see that mathematics teachers were using it as an example as a piece of measuring equipment: they were not using it in the context that the museum had thought of using it for, or even the teachers the museum had asked to catalogue things had thought about using it for. I really suggest you look at that report because it’s quite interesting around some of the early work around this sort of stuff. And I would generally say nowadays that it would be important to look at what teachers currently use to prepare lesson plans, and to do some focus groups with those teachers to see, and just observe them making lesson plans themselves. What do they do? How do they put together a new lesson plan? And see where they go now. Do they go to museum websites at all? If they do go to museum websites, do they use the collections? Do they use the collections searches? Those sorts of things will begin to build a case for whether the focus is on developing new forms of user literacy. Do teachers need to become more aware of what treasures museums have? Probably. Maybe not, but probably. Do they need to know where in museum websites those are usually buried? Probably again. And then what do they want to do with them? Do they really want ----- images? Or do they just want to download an image to stick into their lesson plan directly. And then do they feel confident about the rights and permissions to do that. How do you make that clear to them? How do you make it clear to them in a way that they have confidence? Those are the sorts of things.

So I’d turn it around and actually follow teachers through the lesson plan process: have them making it. And I wouldn’t predetermine that they would use a museum

website for that. Because I would expect that they probably don't, and you may end up, if this was a funded project, spending 50% of your budget on marketing and promotion to make teachers aware that all of these resources are available FOR lesson plans, not just available but actually FOR lesson plans themselves, and that's what... You're building a demand for it. Because I don't know if there is a demand for museum stuff for lesson plans. It's a desire that museums have, but it may not be the reality.

M: SCLDA Digital Learning Resources project. What are your thoughts on a tool like that? Is that a more beneficial approach for museums to approach versus posting sample curriculum for teachers to look at?

S: I don't know. Honestly, I don't know. One of the things I noticed, coming here is that the Smithsonian as a whole still feels that people want to come to it, and trust it as the first place they go, but all the evidence would show it's not the first place they go. That said, the American education system is kind of crazy, and even if you reach a very small percentage of people, because of the population of the United States, it's a big success.

So I wouldn't look to it as a model for New Zealand. I think NZ is far more advanced in many ways, not just healthcare and other things. But actually around just being more coherent. The US feels like Europe, the states are all different countries. New York city is not the same as New York State, yet they have the same school curriculum at the state level but the way NYC schools work is very different than schools in other parts of New York State. It's all bizarre. So the Smithsonian is playing in a different world there, and the Smithsonian has certainly been moving away from "education websites" so to speak, but they find it hard because funders want to fund that stuff, because the funders still think that that's what works... whether the evidence is there that it does is debatable.

R: Smithsonian has inter-museum collaboration so is it more important for museums to work with other museums, or to be working with other websites or other resources of information, not specifically other museums.

S: I think it depends on the mission of the museum, and I think it depends very much on where the museum's natural collaborators lie. So for us (CH), as the National Design Museum in New York, we probably have more affinity with the design world than with the museum world. What that might mean I don't quite know. Other museums may have more affinity with other museums. Certainly museums with art collections might share similarities because they share amongst 6 or 7 museums, they own an entire artists set of works. National museums are slightly different... you know, there's a whole bunch of stuff. I would really stress that NZ is way ahead in terms of collaboration in the museum world than anywhere else, akin to Europe: beyond Europe, even. But I would say that perhaps some of the American museums have a more natural ability to collaborate with commercial players, simply because that's more their world.

R: To follow up with that, do you think collaboration is important? Should it be emphasized, or expected?

S: Collaboration should be expected. The internet is about collaboration, I mean that really is its strength. But I think there's a lot of really basic things that museums can get sorted to make collaboration, no matter what it is or with who, much easier. And the fundamental building block of that is sorting out your rights and permissions, and being very liberal with those, however it meets your needs or whatever) and secondly being very clear about those rights and thirdly having as many assets available online in as many formats as possible as well. And I think Te Papa is pretty good on that, you know, is pretty present. When I started here at CH 2 years ago, there were 10,000 collection records on our website. That was it. Which represented 5 or 6% of the collection. It's now 80% of the collection. Most of it doesn't have photographs, but at least it's there. So you know, it's really about clarity for end-users or collaborators, and that makes a lot of things simple.

Certainly our work we've done with Google and with other people; it's all been, the stumbling blocks have always been about rights. As soon as we've been able to say, "We have a policy about this, all of these are ready to go", it's straightforward, we're on the ball, and we're off.

M: Things we've done Reference group, survey, potential models.

S: One of the things I've seen in my work is getting teachers in and then sitting them in front of Silverback (or similar tools) and giving them a task and recording them doing that task has been very valuable for us to see what people DO rather than what they SAY they do. That's been extremely revealing both to us and to teachers... and to other people too.

M: Thank you