'An examination of home page design New Zealand tertiary libraries'

by

Jessica Elizabeth Howie

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Abstract

Research Problem

The online presence of tertiary libraries is becoming increasingly important, however, research (OCLC, 2010) suggests that library websites are being shunned in favour of commercial search engines. Some scholars (Reidsma, 2012; McCann et al., 2010) attribute this to poor website design. Websites are a valid communication concern and what content is displayed, as well as how it is displayed on library home pages has implications for usability, findability and user perception. Tertiary library websites need to be attractive, modern and user focused in nature. Content needs to be arranged in a way that supports smooth navigation so that users are encouraged to engage with the library.

Methodology

28 New Zealand tertiary library home pages were examined using quantitative content analysis. The proportion of each page dedicated to content elements including design space, graphics, icons and text was recorded, as well as how much space was devoted to research resources, services and tools, and marketing in turn. Also recorded and analysed were the number of links per page and how much content existed below the point at which the user had to scroll down on the most popular browser and screen size. Which and how many Web 2.0 and social media tools were profiled were noted as well as the presence of live help and chat tools.

Results

Home pages were strongly dominated by design space. On average, the space devoted to services and tools and research resources was roughly equal, but both outweighed space devoted to marketing. Similarly, text far outweighed graphics and the majority of pages had what could be considered a high number of links. Only 3 pages offered live help/chat

functions directly through the home page, and 36% displayed no Web 2.0 or social media presence. The vast majority of pages had under 70% of their content above the point at which user had to scroll down.

Implications

New Zealand tertiary library home pages were shown to be content-heavy. Compounding this was a general lack of live or instant help to assist with choice making. While many library home pages utilized Web 2.0 and social media tools, some lacked any presence at all, even if the institution itself did use them. Though the results varied widely, it was observed that while many pages had elements that make up good home page design (graphics, web 2.0 tools, help functions), they could have been used more effectively. Content likely to be of interest to the user was often hidden below the fold, in vast areas of text or was small and not highlighted in any way.

Topic Statement

Introduction

The research proposed here aims to examine the design of New Zealand tertiary library home pages to evaluate how the space is being used. In doing so, it hopes to identify themes and patterns among New Zealand tertiary library home pages with the hopes of pinpointing areas for improvement.

In recent times, academic libraries have undergone a period of change, characterized by a transformation of spaces and services designed to better serve users and improve perception and use of the library. This includes the extension of libraries to include virtual spaces online. However, studies show that online, clientele of academic libraries are turning to commercial search engines such as Google over library websites (OCLC, 2010). In addition, an increase in access to (and reliance on) electronic resources means that students are spending less time in the physical library (O'Reilly & Cronin, 2010) and more time online, in the virtual library.

Whether users access their library website through Google, the institutional home page or through links on other learning tools such as Moodle or Blackboard, tertiary library home pages act as welcome mats (Welch, 2005) to the library for staff, students and potential students and the space immediately visible is prime real estate. Even fleeting first impressions of this space have wider implications for the library and the institution in general. It needs to be immediately obvious to the viewer that what they need is there and easily findable. Speaking at the Library Technology Conference in Minnesota, Matthew Reidsma made the observation that "[libraries] want to change the space because the way people use the space is different, but we're building websites exactly the same way we built them in the 90s" (March 2012). If the home page looks out of date, uninteresting, or cluttered, the student's estimation of the university may be lowered, and they're likely to look elsewhere for research tools and bypass the library website altogether. That's a lot of pressure on a comparatively small space. As Kasperek, Dorney, Williams, and O'Brien, (2011)

observe, users aren't inclined to read large portions of textual information to decide whether or not the website is of use to them, instead, they scan the page for visual clues as to whether or not the page meets their needs. Furthermore, Schwartz demonstrates how too many choices can result in no choice at all being made. Viewed in this context, it's easy to see how OCLC found that library websites were being overlooked in favour of commercial search engines such as Google.

Definitions

The Fold - derived from the use of the word "crease" in the context of print media to describe where the newspaper is folded. The Fold here refers to the point at which the user needs to scroll down on the most popular resolution size of 1366x768. Content placed above the fold is important because it is most immediately visible (Kasperek et al., 2011), so as with newspapers, content that is likely to "grab" a viewer is best placed there.

Tertiary Library - In this context, tertiary library refers to the libraries of post-secondary school public learning institutions, including polytechnics, universities, wananga and institutes of technologies that are signatories to the Ministry of Education Code of Practice.

Web 2.0 - O'Reilly and Battelle (2009) assert that "Web 2.0 is all about harnessing collective intelligence." (p.1) In this context, Web 2.0 refers to those tools and websites that exhibit this quality. In particular, those tools that are of most interest to libraries and their users. Namely, blogs, Twitter and Facebook (Rogers, 2012).

Home page – In this context, home page refers to the first page the client sees upon entering the library website url or linking from another internal or external website that is accessible without a username and password. The content of links and drop down menus are excluded.

Website Design – In this context website design refers to choices made regarding space allocation, layout, the use of graphics and the inclusion or exclusion of content.

Significance

In 2010, the OCLC report, "Perceptions of libraries and information resources" showed that not one respondent started their research on a library website (OCLC, 2010). The findings by OCLC reflect an information society that is increasingly Google-centric, and the impact of this extends to university libraries. The pace of change on the internet has been rapid, as has the pace of change of the physical library, but there is some doubt as to whether library websites have "kept up." In the past, physical libraries were built around physical books. Now, as Stewart (2011) observes, libraries are built with multiple uses in mind - they are social spaces, learning spaces, technological spaces and spaces for events. Spaces are usercentric and no longer arranged according to the needs of the librarian. Beyond incorporating e-resources, websites may not have evolved at the same rate or in the same way and it is questionable as to whether they are immediately recognizable to students as built for them and their needs. Tertiary libraries face stiff competition from commercial websites such as Google, the use of which by students has become instinctual for more than just nonacademic queries. Websites such as Google and Yahoo, while more commonly used for different purposes than library websites, have increasingly sophisticated search features, uninhibited by (often cumbersome) library software as well as simple, attractive interfaces. As such, library websites not only need to be usable and intuitive, they also need to develop their brand in the online, virtual space by making good design choices. Negative perceptions of the library home page can have wider implications for library stereotypes, resource usage rates, funding and university recruitment. By examining New Zealand tertiary library websites, trends and potential areas for improvement can be identified and that may lead to increased usage and more favourable perceptions of the library.

Literature Review

Website Design Evaluation

Detlor and Lewis (2006) aimed to examine and assess academic library websites and make suggestions based on their findings in order to help address competitive threats from commercial services such as Google. They examined 107 ARL member websites via a codebook to "assess and measure library web site functionality in a quantitative manner" (Detlor & Lewis, 2006, p.252). Developed by scanning relevant literature for guidelines and best practice and making alterations as needed, this codebook provided a useful basis for future website evaluations. They make 5 recommendations for the creation of robust library websites - package information content and services in ways that meet user needs, make information seeking the central focus of library website interface design, allow users to customize the library website, invest more resources into interface design and support information use, not just information access (Detlor & Lewis, 2006). Of commercial search, engines, they say that "these for-profit players have invested significantly in their front-end screens and marketing strategies, and can serve up quick bites of information in the way users want - fast and easy" (Detlor & Lewis, 2006, p. 251).

Liu (2008) summarized the content, design patterns and innovative features of academic library websites within the framework of Web 2.0. She situated her research within the context of changing technology and increased competition for library clientele. The researcher examined 111 websites, identifying content elements on their homepages and physical design patterns. The research found that, in general, "homepage content is focused on and arranged according to library functions, resources and services" (Liu, 2008, p.8) and that most academic library websites have an overwhelming amount of text and links. The former of these two points shows that despite the recommendations by Detlor and Lewis (2006), the libraries examined by Liu (2008) continued to package information in a way meaningful to the library, but not necessarily to the user. Liu (2008) recommends making the library website a virtual place, as per a three part conceptual model centered on a user focus, personalization, user engagement, online communities and custom functionality which she calls "remixability" (Liu, 2008). By contrast, Garlock and Piontek's 1999 article advocated for consistency and predictability, advising library web site designers to "let content inform design" (p.4). The discrepancy between these two works typifies the shift from websites as document-based, institutionally focused resources, to dynamic and interactive vehicles for information gathering. For libraries, this shift encompasses the move from websites as library-focused, to websites as user-focused.

Konnur, Ragani, and Mudhusudhan (2010) reflect this in that they challenge the traditional notions of website evaluation, arguing that "traditional evaluation criteria endorsed and applied by librarians over the years are not sufficient for the evaluation of today's hypermedia website environment" (p.3). As such, the objectives of this particular study were very broad - to establish a new basis for evaluation criteria, identify the academic library websites in Bangalore, to know the features of these websites and to rank them based on their results. This study signifies a move away from the traditional and utilitarian view of library website evaluation. However, it would have been useful to provide more detail than just to "know the features" of the sample websites, and rather than rank websites according to findings, identify themes and areas for improvement across the country.

Shieh (2012) chose to investigate website usability from the point of view of findability, which describes the extent to which content is locatable or navigable. His doing so serves as a reminder of the link between websites as a communication concern and website usability. In the words of Morville, findability should precede usability (2005), in that one can only use something if one can find it. Using web logs to track user activity, as well as the more traditional card sorting technique, Shieh (2012) argues that "not merely being filled with abundant data, websites should provide users with easy and smooth navigating architectures in order to help them find what they need"(p.707). While the research proposed here will not explore usability or findability directly, it will explore both indirectly, in that website design dictates intuitiveness, and websites that are intuitive can also be considered usable with findable content.

User Centeredness and Usability

Ruth Connell (2008) took a slightly different approach to website evaluation in that she surveyed web developers in academic libraries to ascertain their backgrounds, and the methods and tools they used in their work. This qualitative approach revealed that even as recently as 2008, most library web site developers are provided with minimal time, training and funds (Connell, 2008, p.128). Her finding that this was true across large and small institutions serves as a reminder that assumptions cannot be made regarding the size or wealth of any given institution and resources used in library website design. Kim's (2011) findings supported those of Connell in her investigation of factors affecting library website design from the perspective of both developers and users. Kim's (2011) research went a step further than Connell's in that she explored how the above-mentioned groups measured library website success, and subsequently found that website developers rated the success of their websites higher on average than their users. Kim rightly identifies this as a "red flag" in terms of usage and the finding adds credence to the significance of the research proposed here. McDonald and Thomas argue that the discrepancies such as the ones discovered by Kim "represent fundamental disconnects between the values of today's library users and the historical core values of libraries that shaped the first generation of online information landscapes" (2006, p.4).

Crowley, Leffel, Ramirez, Hart and Armstrong (2002), focused on user perceptions of Texas A&M University Library's website. They used a focus group approach to gain insight into student's information seeking behavior. Their findings fell into four main themes in terms of student's wishes - the desire for research portals, access to research resources, understanding the navigational structure, help and terminology (Crowley et al., 2002). Furthermore, they state that "the contents on the library's web pages need to be readily identifiable and easily located, and so the menu is only as good as its organisation" (Crowley et al., 2002, p.207). They also make the observation that "participants were contradictory in stating their wishes. They found the web pages too cluttered but wanted everything they needed for their research to be on one page" (Crowley et al., 2002, p.209). Crowley et als' findings reveal a dilemma for website design. As the amount of content increases, the findability decreases. Yet, users do not want to have to look far to find what they need. This demonstrates the importance of design in that it has a role in guiding the user to their required information without them having to read vast amounts of text.

Hulseberg and Monson (2011) more effectively tap into the key question of whether or not library web site designs are user focused in nature. Choosing a case study format, they sought to understand how students interpret library website terminology and features, as opposed to librarians. In doing so they were able to present a case for student-driven taxonomy for library website terminology, features and organization. Their findings revealed 3 important features of library websites, from the student's point of view - ease of use, support for searching by format or subject and research assistance (Hulseberg & Monson, 2011, p.373). They also state that "Students value simplicity, efficient searching, and research guidance, and librarians still have much to learn about student's conceptualization of the content behind web links" (p.361). Davidsen and Yankee (2004) reinforce their point when they say that "many times the computer software or web application reflects the way that the person who programmed it thinks, not the way that the person who will use it thinks." (p.10) In doing so, both Davidsen and Yankee (2004) and Hulseberg and Monson (2011) support Liu's (2008) finding that information on websites tends to be arranged according to the librarian's purposes and points of view as opposed to those of the user. Davidsen and Yankee also introduce the term "learnability" as opposed to "usability," which refers to the extent to which a structure is easy to learn, has close ties with home page design as described here.

McCann, Ravas and Zoellner (2010) aimed to examine the how students and faculty used the website of the University of Montana Library for research purposes. Using observation and open-ended interview questions, they found that users valued readability and consistency, research guidance, ease of navigation, task-based services and the ability to customize the search interface (McCann et al., 2010, p.392). The researchers also cite the OCLC study and attribute its results to poor website design and the combination of overwhelming amounts of information and a perceived lack of assistance (McCann et al., 2010, p.393). Shropshire (2003) also used a case study format, alongside an examination of literature relating to library websites with the goal of pinpointing the salient issues in

website design. She also examined the websites of four specific libraries, including her own. Shropshire's 2003 article is well ahead of its time in that it identifies as a key issue for academic library websites a lack of understanding of the wider context of the web, though the context, has of course, changed over the last 10 years and will continue to do so.

Swanson and Green (2011) carried out a usability study of the Moraine Valley Community College library website. Part of their research was to review equivalent library websites. They observed a trend towards "googlization" of library websites in that web scale discovery searches were increasingly being used on academic library websites and that they were placed front and center of home pages (Swanson & Green, 2011). As a result, they endeavored to find out if such an approach would improve the usability of their own website by creating a mock up "googlized" page and comparing the behaviour and success of participants as they attempted to navigate both pages. They concluded that "googlizing" their own website would not result in increased usability (Swanson & Green, 2011). If their results are accurate, they represent a fundamental change in the way academic library web sites will develop. However, their sample size was very small, totaling only 16 students. Also, they were all from a particular type of institution, therefore, what proves effective for them may not prove effective for tertiary libraries in general. Nevertheless, the research represents a valuable alternative point of view of the tension between Google and library websites in terms of information seeking behaviour. They reinforce the findings of prior researchers regarding simplicity when they state that "homepage real estate is a limited resource. The more items that are added to the site the less findable each item becomes" (Swanson & Green, 2011, p.227).

Web 2.0, Social Media and Marketing

Kaur (2009) describes marketing initiatives being undertaken by academic libraries on their websites. The researchers explored 22 academic library websites in Malaysia, as well as interviewing managers and web authors. Using mostly marketing literature as their guide, they focused particularly on marketing approach as well as promotional and public relations activities. Kaur found that academic library websites are an under-utilised marketing tool (2009), which seems at odds with the findings of Kasperek et al. (2011), whose content 13 analysis revealed that marketing/public relations activities occupied the most space overall on library web sites. This could be accounted for by cultural or economic differences between Malaysia and America, which leads one to wonder how consistent the use of home page space is globally. Interestingly, while the researchers gathered data on library networking with associate groups, they chose not to investigate the presence of social media as means of marketing.

The work carried out by Harinarayana and Raju (2010) examined Web 2.0 features in university library websites. They acknowledge that Web 2.0 has major significance in the current environment. They sought to find out what types of Web 2.0 technologies were being applied and for what purpose they were being used. Surprisingly, they found that only 57% of the sites surveyed used one of the Web 2.0 features they measured (Harinarayana & Raju, 2010, p.85). Curtis Rogers (2011), of the South Carolina State Library, carried out a survey that also aimed to ascertain how American libraries were using Web 2.0 applications and social networking tools to promote their programs and services. Although the response rate from academic librarians was low, its findings were still useful in that he found that an overwhelming number (96.2%) of respondents considered Web 2.0 tools to be important for marketing and promotion (Rogers, 2011, p.5). Facebook was by far the most popular social media tool used by respondents, with the libraries of 86.6% of the respondents using social media of some kind (Rogers, 2011, p.4). One weakness of the research is that their sample consisted only of web pages that used at least one of their listed Web 2.0 features. This reduced their sample size from 100 to 57. This is at least as interesting a statistic as their final findings, but is not discussed further.

Websites as a Communication Concern

Kasperek et al (2011) aimed to examine the messages academic library websites send to their viewers through content analysis. They assert that "Academic library home pages are not only access points to the resources and services of a library, they are virtual representations of the library itself. The content placed on the page, where it is placed, and the amounts of space allotted are all choices that send a message about the character of the 14

library, the resources a user should start with, and the library's attitude toward its users" (p.220). The researchers used screen capture technology to record the home pages of 49 American University libraries, and also made note of at what point users had to scroll down. They then used Adobe Illustrator to "map out" and calculate categorized areas of library home pages. Though the least straightforward element of their methodology is the categorization of links, it was discovered that public relations and marketing featured prominently on most pages (Kasperek et al., 2011). Features and feature locations were also recorded, with a particular emphasis on the type, size and location of the search boxes. Interestingly, the researchers methodology and discussion is heavily informed by noninformation studies material surrounding the decision making process, particularly Schwartz's (2004) "The Paradox of Choice," which argues that too many choices can result in no choice being made at all. They say "one can imagine a college freshman encountering a library web page crammed with lists of links to content and saying 'forget it', and moving onto Google's more streamlined search interface despite the library resources being of the utmost value and importance" (p.222). Steven Bell (2010) expounds the virtues of letting marketing concepts influence academic library website design with direct reference to reducing the number of links – "When it comes to library homepage design, thinking more like a marketing team than librarians will lead to a redesign that promotes a 'who we are and what we can do for you' approach as opposed to one that simply tries to cram as many links to content as possible onto the page" (p.3).

Newell (2005) looked at the messages libraries send their users through the perspective of visual social semiotics, and in particular, visual grammar theory. The researchers argued that "Cameras do not take pictures; library imagemakers construct them," (Newell, 2005, p.55) and that meaning is implied through visual configurations such as camera angle, gaze, gesture and composition. They found that overall; such photographs display professional power on the part of the librarian and medium levels of professional warmth (Newell, 2005). Newell discusses his findings at length, especially in regard to professional culture, but unfortunately he never defines his use of the term "image maker," which is a concept central to his research. He could be referring to the photographer, the web page designer, library management or a marketing department. While his findings are very interesting, to

apply this research in the New Zealand context would result in too small a sample size for the results to be reliable. Nevertheless, the findings of Newell reinforce those of Kasperek et al. (2011) in that they highlight the library website as a means of communication with the power to influence user perception based on design choices – "a communication revolution is taking place in which the public is receiving much of it's information about and from organizations and institutions via the computer screen." (Newell, 2005, p.54)

Conclusion

The papers discussed above share a common theme of library website design post 2005. The latter point is hugely important given the massive changes in the nature of the web and the technological environment in which libraries exist over the last seven years. Many authoritative website evaluation works in the 90s and early 2000s are less useful now given the rapid rate of technological change and popular design. Despite their varying approaches, the research discussed above displays following recurring themes.

- Technology and competition: Nearly all the papers cite threats to academic library services online and the importance of a robust online presence. Many point to the decline in the use of physical libraries and the need to meet user needs online. The importance of Web 2.0 as identified by Harinayarana and Raju (2010), as well as Rogers (2011) and Liu (2008) can also be addressed in this research.
- User-centric versus Library-centric: The literature reviewed here reveals a tension between the influence of the users and the influence of the librarian on website design. Compounding this tension is the fact that much of the literature looks to librarians for their data, rather than users. Despite this, a recurring theme in library literature in general is the necessity to offset the "librarian knows best" perception. Some sources (Newell, 2005; McCann et al., 2010) identified a power imbalance on the part of the library as a whole, as per several manifestations. Detlor and Lewis (2006) and Liu (2008) place particular importance on consideration of user needs. Liu states that "the universe of information presented on academic library

homepages still focuses on library functions, requires numerous pathways for access, has overwhelming options, and takes a one design for all approach that fails to recognise users as individuals" (2008, p.11). A by-product of the user centric approach is the repeated call for customisation (Detlor & Lewis, 2006; McCann et al., 2010; and Liu, 2008).

Information Overload: Bell (2010) and Reidsma's (2012) views on the overuse of links is reinforced by Liu (2008), who advises libraries to "reduce the intimidating appearance of library homepages by using as little text and linking as possible to convey only the most necessary access points and by employing an appealing graphical design that accommodates usability and accessibility requirements" (p.12). The findings and recommendations of many of the papers (Detlor & Lewis, 2006; Crowley et al., 2002; Hulseberg & Monson, 2011; McCann et al., 2010; and Liu, 2008) argue for the necessity to provide direct assistance in the form of research help or chat features. As such, it would be useful to measure the frequency and prominence of research help on home pages. Furthermore, Thaler and Sunstein (2008) assert that as the decision making process becomes more complex, the need for assistance also increases, reinforcing the notion that immediately recognisable research assistance is one of the hallmarks of a 21st century, user-orientated library website.

None of the works cited are New Zealand based, and indeed there appears to be very little research currently published that explores New Zealand academic library websites. Though several unpublished dissertations explore usability (Lee, 2006) and design (Born, 2007), there are none that approach the topic specifically from the perspective of communication as proposed here. The discrepancy between the findings of Kaur (2009) and Kasperek et al. (2011) remind us that we cannot assume that tertiary library website design is consistent across different countries of origin. Kasperek et al. (2011) come closest to the research I propose. Though their research is on a much larger scale, their basic approach can be articulated and enhanced with the addition of measuring the number of links and Web 2.0 features.

Research Questions

The literature reveals several major issues for website design and space allocation. Much of the literature calls for the ability to let users customise their web interface, however this technology is still in its infancy and research around it would be more effective and more useful further into the future. Likewise, increased functionality of search boxes (for example, web scale discovery) will have a large impact on website design in the near future, and more detailed study is required on this as technology develops and is implemented more widely.

What comes through strongly in the literature is the importance of the arrangement of content on tertiary library websites, particularly in its effect on intuitiveness, findability, attractiveness and currency, and therefore its estimation in the eyes of the user. The physical design of the home page has the power to shape the user's perception of the library itself. The allocation of space to content elements and the use of design space and graphics are closely tied to these issues. Scholars in library sciences are calling for more consideration of user wants and needs and websites need to brought in line with what users want and have grown accustomed to, while still advocating for information literacy and autonomy in information seeking. Thus, excessive content without the offer of help has the power to deter users from using the resources and services the library offers. Similarly, the rise of Web 2.0 and social media, as with chat and help functions, are hallmarks of a modern, user-focused home page, and therefore featuring these elements prominently and strategically on home pages may be beneficial to tertiary libraries.

How are New Zealand tertiary library websites using the space on their home pages?

- 1. How is space allocated on New Zealand tertiary library home pages?
 - a. What proportion of space is allocated to categories of content? Specifically, marketing, services and tools, research resources and design space?
 - b. What proportion of space is allocated to graphics and design features such as white space and text?

- c. What percentage of the page appears "above the fold" and can be seen without having to scroll down on the average screen size?
- 2. Is there an overload of information as described by Reidsma (2012) and Bell (2010) on New Zealand tertiary library home pages?
 - a. How many links do New Zealand tertiary library home pages contain?
 - b. Is instant research help offered as advocated for by Thaler and Sunstein (2008) in order to counterbalance the volume of content?
- 3. Which Web 2.0 tools are being featured on New Zealand tertiary library home pages?

Methodology

Research Design

The research proposed here can be broadly categorized as quantitative content analysis. In order to answer the research questions, home pages must be broken down into measurable data. This data will then be analysed in order to identify themes and areas for improvement.

Sampling

This research focused on New Zealand tertiary library home pages. Public tertiary institutions who were signatories to the Ministry of Education Code of Practice were included as per their website (Ministry of Education, 2010). Christchurch College of Education, Tairawhiti Polytechnic and Telford Rural Polytechnic were subsidiaries of larger institutions, and the library link on their websites led to the parent institution's library home page. These library home pages were excluded from the research, leaving 28 library home pages to be examined.

Data Gathering

To ensure the most realistic path to the website, a link (or in some cases, a series of links) to the library home page was followed from the institutions home page accessed through Google. According to web analytics company W3, the most popular browser at the time of the research was Google Chrome (17.37%) and the most popular screen size was 1366x768 (19.47%) (W3 Counter, 2012). As such, that is what the pages were captured in, using a web sizer extension for accuracy.

The main library home page of each tertiary institution was examined during the first week of 2013. Firstly, the Google Chrome extension "Awesome Screenshot: capture and annotate" was used to capture and save the entire page as it appeared at that particular time and using only one computer at the designated screen resolution of 1366x768. Pages were exported as PNG files. PNG files were chosen since when opened in Apple's preview

function, they can be zoomed in or out, yet the size of spaces will show in their original pixels.

Using the crosshair rectangle tool, which turns the mouse to a cross (allowing for greater accuracy when drawing) the pages whole area was measured and noted in pixels in Microsoft Excel. The above the fold space was assumed to be 1366x696, which is the viewport size for the most popular screen size of 1366x768 (which is the window size minus the toolbar). The above the fold percentage of each page was then calculated by subtracting the above the fold area from the total page area. No page had content that had to be scrolled across to view, so the area for each page was calculated by multiplying the page length (in pixels) by 1366. Some websites presented all of their content above the fold and were shorter than 696 pixels long. These were marked as 100% above the fold. If such pages were smaller than 1366x696 vertically or horizontally (and, as such, included blank or unused space), such as in the site on figure 1, all the space in the viewport was included in the calculations. This was for consistency across the pages, and also because this research is concerned with what appears on the home page in the given browser and size. Furthermore, there would have been difficulty involved in discerning deliberately used design space and space added as buffer where a page is smaller than the viewport. This extends to the user in that in their initial scan of the page, they like the researcher, simply see unused space as just that – blank space, and the use of space is at the heart of this research.

To calculate the space devoted to different categories of content, the PNG files were exported into "Paintbrush" and using a colour coding system, the rectangle tool was used to overlay transparent colour over different categories. The resulting "mapped" page was then re-saved as a new PNG file. Using transparent colour meant that other researchers if necessary could verify the categorization. For each page, the space devoted to each category was added up in pixels and a percentage was calculated based on the total area of that particular page. The remaining space was defined as "design space" and the header and footer was included in this figure. Categorization followed the example of Kasperek et al. (2011) using the following criteria:

- Design Space
 - o Graphics
 - Header/footer
 - White Space
 - o Icons
- Research Resources
 - Library/database/discovery search boxes
 - Referencing and Citation
 - o Guides
 - o Journals and Databases
 - o Collections
 - Library Skills/Information Literacy
- Services and Information Tools
 - o Hours
 - o Feedback
 - o Interlibrary Loan
 - Circulation/borrowing
 - o Staff
 - Contact and assistance
- Marketing
 - o Public Relations

- News and events
- Web 2.0 and Social Media Tools
- New Books/Art
- Mission Statements/Goals

Figure 1 shows an example of how a page looked after its content was "mapped." Content shaded in red represents research resources, yellow represents services and tools and blue marks the space devoted to marketing and PR. The header and footer remains unhighlighted because, as with all the pages, this area constituted design space.

Library. Teaching and	Learning ~ T		kau				Search
Lincoln University LTL Websi Website	te Hub for	staff Learn	(Moodle)	Student Learning		LUCAS	itHelp Website
Find books, articles, theses, mu	Itimedia and more)	LibraryS	earch			Ask us
			Databases	Catalogues	More	Quick II	nks an search
Develop your learning	Commur res	nicate your earch		Enhance your teaching		 Worksho Study Ro Contact 	ops/Appointments oom Bookings us
Christmas closure Library Teaching and Learning will Spm more	l close for the Chr	istmas/New Year	break on T	Tuesday 18 Deceml	oer at	About	do
Featured new books of t Sharpe's Honour by Bernard Cornwell	satured new books of the week Sharpe's Honour Sharpe's Honour Budapest by Benard Commell Budapest by Benard Todays and To						r Hours 1g
(Harper, 2008) Database trials currently available		(DK, 2004) New Items in o	ur Collecti	on RSS feeds 🚮		Informa ► Students ► Postgrad	tion for i Juates
more Library, Teaching & Learning	news	New Items	in the Re	search Archive 🔝		► Staff	
						If you ar student complete Informat studying	e a new first year you are required to e Learning and ion Skills as part of at Lincoln.
						Sellow	e & Lincoln ULibrary
		Star Tweet	17	Like 25			e Print version
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Figure 1 - Categorization of content

At this point the number of links were counted and recorded in Excel, as was the presence of any social media or Web 2.0 tools. This included times when there was a button not linking to a library account, but allowing the user to share the page on their account. "Share this on Twitter" or "share this on Facebook" were common examples of this. All that were displayed were recorded and these included Facebook, Twitter, Flickr, Youtube, blogs and RSS feeds. All links were counted regardless if they were internal or external.

Using the crosshair rectangle function each page was "mapped" again, this time in terms of the space devoted to text and space devoted to graphics. These figures were recorded as pixels then converted to a percentage based on the entire size of each page. Text which was highlighted with a graphic could potentially be defined as either text or graphic and was therefore given a third label - icons. Branded links such as "my account" functions were an example of this. This is because they serve the same purpose as graphics in terms of providing a visual "break" in the text, but were still essentially text. The pixels for each area were recorded, added up, and converted to a percentage of each page in Excel. The remaining space was assumed to be "design space," which includes the header and footer and any white/unused space. As Kasperek et al. (2011) observed, headers and footers, while often containing graphics and content, have implications for the whole website, and often pertain more to the institution than to the library. Therefore, it was considered more useful to view them as design space. Because this part of the research was concerned with the proportion of graphics, text and design space, design space here excluded graphics and graphics were measured in their own category (unlike the research around categorization, which, because it was concerned with content, included graphics as part of design space). In the interests of simplicity, and to avoid the duplication of data, the proportion of design space that was occupied by graphics was not recorded alongside content categorization.

Using the same method, the presence of any live help functions was noted and the pixels devoted to them calculated and recorded.

Approach to Data Analysis

The following elements were measured and discussed -

- Percentage of space devoted to each category as per above (research question
 - 1a)

- Percentage of text, graphics and icons (research question 1b)
- Percentage of page below and above the fold (research question 1c)
- Number of links (research question 2a)
- Presence and size of "live" research help tools such as chat (research question 2b)
- Presence of Web 2.0 and social media tools (research question 3)

Limitations

This research is exploratory only. It does not aim to evaluate/rank websites based on its results. Furthermore, websites are "moving targets" and can only be examined and analysed in the form they exist at the time of data gathering. The research proposed here does not claim that the pages examined will remain as they are at the time of data gathering. Ideally, the pages would have been analysed in a range of the most popular browsers and screen sizes. However, given the scope of this research it made more sense to simply pick the most popular based on web analytics (W3 Counter) and use it consistently. It must be recognized that the pages in this research may appear differently on different computer set ups, and results would vary across browsers and screen sizes, given that much of the analysis relies on measurements of space. As such, this research will serve as a "snapshot" of themes and patterns at a particular point in time, on a particular browser and screen size. Likewise, sub pages and mouse-overs are excluded from this study in the interests of viewing the home page in the same way a potential user would. For example, just because no Facebook page or instant chat function was displayed on the home page, does not mean one does not exist. As Kasperek et al. (2011) remind us that users will decide on the usefulness of a page quickly and without close reading or exploration, just the home page will be examined. Because data will be gathered over the Christmas/new year period, home pages may appear slightly different than other times of year. However, since web pages are available around the clock and around the year, it can be assumed that they are a valid communication concern at all times. A distinction must also be made between measuring the effect of home page design on user perceptions, and measuring the way space is used on home pages in their own right. While this study is concerned with the effect of home page design on user perception, the focus is on the later point and aims only to explore the use of space on home pages by libraries.

Results

Research Question 1: How is space allocated on New Zealand tertiary library home pages?

In order to answer the first research question, the study recorded the area devoted to different content elements, and calculated percentages based on the total size of each page. Averages were then drawn from these percentages.

What proportion of space is allocated to categories of content. Specifically, marketing, services and tools, research resources and design space?





Figure 2 shows that design space was by far the biggest use of space. Design space (including white or blank space, headers and footers and graphics) ranged from 37% to 94% with an average of 72%. Space allocated to research resources ranged from 1% to 25% with an average of 10%. The average for space allocated to services and information tools was similar at 11%, but with a wider range at 0% to 37%. Marketing was allocated the least 26



space, ranging between 0% and 20%, averaging 7%.

Figure 3 – Allocation of Space per Institution

Figure 3 demonstrates the variance in the results of individual pages. This design space varied from blank white space, to large headers and footers, to background patterns consistent with the institution's marketing.

What proportion of space is allocated to graphics and design features such as white space and text?

Figure 4 shows the average allocation of space to design space, graphics, icons and text.



Figure 4 - Proportion of Graphics to Text

The research shows that, on average, pages contained much more text than graphics. The percentage of each page devoted to graphics ranged from 0% to 18%, with an average of 5%. If icons are regarded as graphics, that figure grows to 7%. Text, by comparison, dominated more space, ranging from 8% to 56% and averaging 25%. The research regarding text and graphics reinforced the prior finding that pages were dominated by design space at an average of 68% when measured against graphics and text.



Figure 5 Proportion of Graphics to Text per Institution

Figure 5 shows the variance in use of space per institution.

What percentage of the page appears "above the fold" and can be seen without having to scroll down on the average screen size?

Page sizes varied from 1366 x 696 (fitting in their entirety the average 1366x768 of space within the Chrome browser) to 1366 x 9057496 pixels. However, 27 of the 28 pages presented more than 30% of their content above the fold. The percentage of the page that appeared above the fold ranged from 9.5% to 100%, with an average of 66%.





Is there an overload of information as described by Reidsma (2012) and Bell (2010) on New Zealand tertiary library home pages?

The assertion by Reidsma (2012) and Bell (2010) that library home pages are overloaded with links is reinforced by Schwartz (2004), who argued that too many choices can overwhelm users. One of the main goals of this research is to establish whether this is the case for New Zealand tertiary library home pages.

How many links do New Zealand tertiary library home pages contain?

The pages examined had between 4 and 68 links. The average number of links was 37.



Figure 7 - Number of Links per Institution

Is instant research help offered as advocated for by Thaler and Sunstein (2008)?

Although all of the pages contained contact information or links to contact information, and many had enquiry forms, only 3 of 28 had live help options. The space devoted to live help on these pages was small, at 1.57%, .74% and .29%.

Which Web 2.0 tools are being featured on New Zealand tertiary library home

pages?

The research showed that only 18 out of 28 (64%) of the pages examined displayed any social media or Web 2.0 tools. The maximum number of tools displayed on the home page



of any one library was 5, as shown below on Figure 8 -



Figure 9 shows the occurrences of Web 2.0/social media tools across all the pages. The most popular tool was Facebook, which 12 of the libraries had icons for on their home pages. This was followed closely by Twitter (10) and RSS feeds (9). Also featured were Youtube (7), Blogs (5) and Flickr (4)



Figure 9 – Popularity/occurances of Web 2.0/Social Media Tools

Discussion

How is space allocated on New Zealand tertiary library home pages?

What proportion of space is allocated to categories of content. Specifically, marketing, services and tools, research resources and design space?

Across all the pages, after design space was excluded, research resources (37%) and services and information tools (39%) occupied a relatively equal amount of space. Marketing, on the other hand, occupied only 24% of the used space, on average. As such, this research found that online, libraries are placing more emphasis on their core offerings – research resources and library services and tools, than marketing. The research also indicates that generally, libraries place equal emphasis on services and tools, and research resources. This is important, considering that the main function of libraries in the new information age is that of guide. Users need the help of libraries and librarians in order to successfully navigate the vast and complicated world of scholarly resources. Conversely, those scholarly resources need to be easily accessible. Therefore, it is a positive sign indeed that New Zealand tertiary libraries are positing their resources alongside information about their tools and services. In this way, they are offering not only the resources in their own right, but offering themselves and their services, and their help, in the online world. For example, a user is far less likely to be intimidated by the idea of using a particular database if their attention is also drawn to the fact the library offers tutorials on using it. This reflects the marketing approach advocated for by Bell (2010) – "who we are and what we can do for you" (p.3). Though by Kaur's (2009) standards, at least, the results show that the libraries could be putting more emphasis on marketing. Of marketing and design space, Kasperek et al. (2011) observed that the pages in their study "primarily used hyperlinked text when linking to research resources and services and information tools and primarily used graphics for marketing." (p.235). Such was not the case in this study, so it's possible to conclude that New Zealand tertiary libraries could be putting some of their high proportions of design space to good use for marketing.

It may be said that the findings of this research contradict Liu's (2008) assertion that libraries continue to package content in a way that is more meaningful to the library than to 32 the user. Had this research found that home pages devoted a disproportionate area of space to research resources and very little to services and tools, Liu's point would have been reinforced. However the fact that services and tools were presented on an even footing with research resources is positive.

The research clearly demonstrated that pages were highly occupied by design space. Although the pages varied between 37% and 94% design space, 24 of the 28 pages examined had more than 60% design space. The average area of the total page occupied by design space was 72%. The issue of design space is complex. Design space as measured here represents that part of the page that is not text. Therefore, without design space, a page would be one solid block of text. Even if the text had value, there would be little in the way of visual clues to show a user which text belongs to which category, which category is of interest to what group, and therefore where they should look for what they need. On a page without headings, a user may be forced to read each word of text to establish whether the page met their needs and whereabouts the information or tool was that they needed. However, design space can be used effectively or not effectively. On some pages, there was a high proportion of design space, but it was clustered at the bottom of page in the form of blank white space. This did little to balance the page visually, and the content portion was still clustered in its own block near the top. Conversely, some pages had design space in the form of graphics or patterned backgrounds that added to the overall impression of the page and provided visual interest. An example of this would be the library home page for Auckland University of Technology.



Figure 10 - Auckland University of Technology library home page

Figure 10 shows the website of Auckland University of Technology's library. Although this page contained no graphics (other than what is in the header and is therefore excluded) and few icons (6.3%), the 71.4% of the page that is devoted to design space is used highly effectively. Because categories of content are organized together under headings, emphasized through colour and text size, this page effectively uses design and visual clues to provide the user with an intuitive and dynamic experience; despite the fact it is text heavy. Furthermore, the fact that the design space is coloured and patterned makes the page attractive visually. This example serves as a demonstration of how design space (or blank space) can help or hinder the overall appearance of a page.

What proportion of space is allocated to graphics and design features such as white space and text?

Graphics and icons are important in web design because they help to direct users to information. Graphics have the ability to provide the user with visual clues as to the purpose 34

of the content, the values of the institution, and the tone of the page. Very few current web pages are text only. In 2011, Aharony found that one of the main differences between academic library websites in 2000 and 2010 was an increased use of graphics. Furthermore, he asserts that "the use of graphics on library academic websites attracts and motivates library patrons to enter the site and examine it's content" (Aharony, 2011, p.771). In his study, 27 of the 31 websites he looked at were text only in the year 2000 yet none of those same websites were text only in 2010 (Aharony, 2011, p.769). In this study, by comparison, 4 out of 28 institutions did not have graphics among their content. Therefore, the findings of this study seem more in line with Aharony's examination of pages in 2000 (2011). However, with only 1 of these 4 pages was text only. The other 3 included icons, which go some way to breaking up the page visually. The percentage of design space in this study averaged 68%, as opposed to text at 25%. Graphics and icons combined totalled only 7%, on average. Despite this, it must be remembered that just because a page has few or no graphics, does not mean it is not arranged in a way that is meaningful to the user, but graphics do help and it is a reasonable assumption that many tertiary library home pages could be improved with the use of graphics or icons. Figure 11 shows the library home page of Christchurch Polytechnic Institute of Technology, which effectively uses relatively small areas of graphics. Graphics are placed on the far right and far left as well as two long, low images underpinning content on services. In this way, the page is balanced and visual interest is added. Furthermore, the use of icons on the right of the page show how relatively small, uncomplicated graphics can help to aid users in what they need to find. The icons are small, fit the aesthetic style of the page and are relevant to the link they are attached to. They also use symbols that are likely to be immediately recognizable to the target market of the page, for example, the use of the wi-fi symbol on the laptop for the wireless access link.



Figure 11 - CPIT library home page

On the other hand, it must also be acknowledged that many graphics does not necessarily make a more visually appealing page. As with all design elements, graphics can be used effectively or not effectively. For example, some graphics have their backgrounds integrated more easily into a page, whereas plain, rectangle shaped, uncaptioned or irrelevant graphics do little to enhance any web page. In some cases (such as in figure 1), graphics were integrated into headers and although they weren't counted, did add to the visual appeal of the page.

What percentage of the page appears "above the fold" and can be seen without having to scroll down on the average screen size?

Kasperek et al. (2011) argue that "By making the bulk of the content available above-thefold, users expend less energy perusing the available choices" (2011, p.241). For them, this is closely related to the choice architecture explored by Schwartz (2004) in that by offering users fewer choices, they also save the users time and energy. Only 3 of the 28 libraries had 36 all of their content above the fold. All of the content in these pages was viewable on the 1366x768 Chrome browser without the user having to scroll down. While one library had only 9.5% of it's content above the fold, all of the other libraries had over 30% visible without the need to scroll down. The average for all pages was 66% above the fold. Content placed "above the fold" or "above the crease" is ideally that which is most important, or most attractive. It may be said of library home pages, then, that content which we want our users to see immediately should be placed above the fold. For example, core functions such as search boxes and resources could be designed to appear in their entirely above the fold, but with peripheral and promotional offerings below the fold, following a visual break on the page. No pages in this study appeared to be designed in this way, although pages will display differently on different browsers and screen sizes, and this research simply used the most popular.

Is there an overload of information as described by Reidsma (2012) and Bell (2010) on New Zealand tertiary library home pages?

How many links do New Zealand tertiary library home pages contain?

Liu (2008) cites simplicity as a hallmark of a home page that is user focused in nature, appealing to libraries to "reduce the intimidating appearance of library homepages by using as little text and linking as possible" (p.12). Stephen Bell asserts that if the number of links on a library home page exceeds 25 or 30, then "it may be time to ask if so many links are needed" (2010, p.2). The average number of links on the home pages of the libraries examined here was 37. 19 of the 28 libraries had over 30 links on their home pages, and 6 had more than 50 links, indicating that there is some potential for New Zealand tertiary libraries to simplify their home pages. That is not to say that libraries need to reduce the amount of content available online. Rather, they would benefit their users by provided fewer and broader links from their home page, or arranging them in a more logical way,

improving the navigational architecture of the page. Further links may still be found behind other links, on deeper pages, or in drop down menus.

For example, if a user is looking for library hours, and it is one link among 50 on the library home page, then they potentially need to read 50 titles, or link headings to find what they need. By comparison, if, upon entering the library home page, they have the option to click on Services, Borrowing, Research Tools, or About Us, they are likely to very quickly realise that what they need will be within, around or under "About Us" They will find it even quicker if the categories are highlighted as major links through the use of graphics, blocks of colour or fonts. Furthermore, there is much more visual appeal to a page with fewer links to read through.

Is instant research help offered as advocated for by Thaler and Sunstein (2008)?

Thaler and Sunstein (2008) argue that as the decision making process becomes more complex, so too does the need for assistance. Yet only 3 of the 28 pages offered instant help options. They were also very small, the biggest occupying only 1.57% of the total page. McCann et al. (2010) blamed the OCLC results partially on a perceived lack of assistance. It is important to note that they chose to use the word "perceived" - the problem is not, it would seem, with a lack of help. Further to that, live help functions are unlikely to help with web page navigation. Rather, the presence of a help function (and even more so, an instant one) serves to inspire confidence in the user and give them an alternative to using another website if they don't immediately see what they are looking for. Detlor and Lewis (2006, Crowley et al (2002), Hulseberg and Monson (2011), McCann et al (2010) and Liu (2008) all agree that help is required on library web pages, and it would appear that the libraries in this study had heeded their warning. All of the web pages had contact pages or help forms, and many touted the fact that enquiries would be answered within 24 hours. Many also had multiple avenues for getting in touch, information on staff and the services those staff could offer, as well as pointing students to physical help desks. However, while Google beckons from another tab, a strongly emphasized link to live, instant help at point of need is a good use of space indeed, especially considering the complexity and number of links on most pages. Of course, the implementation of a live help or chat function is not without cost, and 38

will not be realistic for all institutions, but viewed in the light of the literature, it is easy to see how it is increasingly becoming a necessary extension to the in-library reference desk.

Which Web 2.0 tools are being featured on New Zealand tertiary library home pages?

18 of the 28 pages had the presence of at least one Web 2.0 or social media tool on their home page. On the 28 pages examined, Web 2.0 and social media tools were featured 47 times in total. Thirteen of the libraries featured more than one social media or Web 2.0 tools on their library home pages. The findings of this study supported those of Rogers (2011) in that Facebook was found to be the most common tool used. It was concerning that 10 of the 28 libraries had featured no social media or Web 2.0 features on their home page at all. While not recorded in this study, it was observed, through the process of accessing the library home page, that a vast majority of the institutions did have Facebook pages or Twitter accounts, but often there was not a link or icon on the library home page itself. This is an example of the discrepancy between the values of users and the architects of library web pages. Social media in particular is central to the lives of a vast majority of today's students and they are accustomed to seeing links to social media and Web 2.0 tools on home pages in general. These links are important because, from the point of view of the user, they represent the ability of the library to meet them on their own turf, as opposed to on library grounds. In addition, it allows them to interact with the library, to keep up to date, make connections and participate in the giving of feedback and the sharing of information. If the link to those functions is buried within other links and sections, they are likely to overlook it and miss the opportunity to engage. This research does not assert that the more tools displayed, the better, or that some tools are better than others. Further research in the area of how library users engage with libraries via social media is clearly needed. Several pages grouped Web 2.0 content under headings such as "follow us" or "connect", followed by the corresponding icons. This is a great use of space for several reasons in addition to those listed above. The icons are instantly recognizable to the new generation of students as part of "their world". This signifies to them that the page is there for them and can help them in a way that is meaningful to them. Secondly, social media in tertiary libraries has the

ability to function in the same way as instant help does. Even though enquiries may not be answered instantly on Facebook or Twitter, or may be answered quicker using an online enquiries form, the presence of these tools implies to the user that help is there, in a format the user is accustomed to and is offered as part of a series of tools put there for their use. Thirdly, the icons act in the same way as graphics, as a way to break up the page and draw the eye to certain areas without the need for close reading of text.

Conclusions

The research carried out here was based on the principle that design influences choice (Thaler & Sunstein, 2008). Not only the choice of what tools to use on a given page, but also the choice as to whether or not the page is bypassed in favour of a page whose design makes choice easier.

Google, for example, is visible in its entirety on all browsers and screen resolutions. It has 15 links, is composed of 13% graphics, 2% text and 86% of it's space is white space around one central search box. While this research certainly does not endeavour to compare Google with library home pages, nor to advocate for a "googlization" of library home pages as explored by Swanson and Green (2011), libraries must keep in mind that this is the level of simplicity and design that most users have grown accustomed to. Due to the complexity of tertiary library resources, there is little chance that library home pages will ever reach this level of simplicity (and nor should they). However, they can take a leaf out of Google's book in that they must use the space on their home pages to make it clear to their users that they are for them, what they need is there, and provide them with visual clues to make their path to the information they seek well lit.

Reidsma, (2012) as part of his conference presentation, displayed tweets relating to student's perceptions of a university library website. One of the many posited, in regard to the library website, "Include everything! Emphasize nothing! Add more advanced options! Fill up ALL the space!" This lighthearted look at student perceptions from within the realm 40 of the user betrays the extent to which users glean from websites the attitude of the institution. Clearly this student sees the library website as overloaded with content, overly complicated, ill designed, and was moved enough to tweet about it. The tone also emphasizes the disdain felt by students towards library website designers, and, by extension, librarians. It also reveals how integral social media is to the lives of students in the current environment, and that this is not limited to their personal lives. Tertiary libraries need to use their home pages in order to dispel the kind of perception exemplified by this tweet.

The research carried out here shows that there is a great deal of home page design variation among tertiary libraries in New Zealand, but that there is also much room for improvement. While it explored how space is allocated and what design elements are featured, what emerged was a need to explore not only what was included, but how effectively it was included and what constitutes effective inclusion of content. For example, while it concluded that graphics are underused on library home pages, it cannot conclusively say that more graphics results in a better home page. Consequently, there is a need for research into how design features are most effectively used on library home pages. Naturally, there is also an emerging need to explore tertiary library websites from the user's point of view.

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Appendices

Tertiary Institution	Pixels Above (excluding tool bar)	Pixels Below	Total Pixels	Percentage Above the Fold
Aoraki Polytechnic	950736	9057946	10008682	9.5%
Auckland University of Technology	950736	248612	1199348	79.3%
Bay of Plenty Polytechnic	950736	523178	1473914	64.5%
Christchurch Polytechnic Institute of Technology	950736	50542	1001278	95.0%
Eastern Institute of Technology	950736	732176	1682912	56.5%
Lincoln University	950736	461708	1412444	67.3%
Manukau Institute of Technology	950736	401604	1352340	70.3%
Massey University	950736	1443862	2394598	39.7%
Nelson Marlborough Institute of Technology	950736	25954	976690	97.3%
Northland Polytechnic	950736	1174760	2125496	44.7%
Otago Polytechnic	950736	0	950736	100.0%
Southern Institute of Technology	950736	596942	1547678	61.4%
Tai Poutini Polytechnic	950736	441218	1391954	68.3%
Te Wananga O Aotearoa	950736	1136512	2087248	45.5%
Te Whare Wananga O Awanuiarangi	950736	208998	1159734	82.0%
The Open Polytechnic of New Zealand	950736	0	950736	100.0%
Unitec New Zealand	950736	643386	1594122	59.6%
Universal College of Learning	950736	659778	1610514	59.0%
University of Auckland	950736	805940	1756676	54.1%
University of Canterbury	950736	341500	1292236	73.6%
University of Otago	950736	349696	1300432	73.1%
University of Waikato	950736	331938	1282674	74.1%
Victoria University of Wellington	950736	777254	1727990	55.0%
Waiariki Institute of Technology	950736	275932	1226668	77.5%
Waikato Institute of Technology	950736	0	950736	100.0%
Wellington Institute of Technology	950736	383846	1334582	71.2%
Western Institute of Technology Taranaki	950736	1859126	2809862	33.8%
Whitireia Community Polytechnic	950736	1316824	2267560	41.9%
Table 1 - Percentage of page above the fold				

Tertiary Institution	Research Resources	Research Resources %	Services and Information Tools	Services and Information Tools %	Marketing	Marketing %	Design Space	Design Space %
Aoraki Polytechnic	1148761	11%	434739	4%	0	0%	8425182	84%
Auckland University of Technology	125903	10%	136272	11%	185837	15%	751336	63%
Bay of Plenty Polytechnic	114711	8%	36848	3%	8925	1%	1313430	89%
Christchurch Polytechnic Institute of Technology	93541	9%	57827	6%	85133	9%	764777	76%
Eastern Institute of Technology	119870	7%	219047	13%	253788	15%	1090207	65%
Lincoln University	155624	11%	156212	11%	133772	9%	966836	68%
Manukau Institute of Technology	337737	25%	452821	33%	60672	4%	501110	37%
Massey University	286484	12%	150428	6%	149564	6%	1808122	76%
Nelson Marlborough Institute of Technology	109200	11%	199232	20%	0	0%	668258	68%
Northland Polytechnic	59480	3%	392712	18%	22695	1%	1650609	78%
Otago Polytechnic	27412	3%	43986	5%	17511	2%	861827	91%
Southern Institute of Technology	52292	3%	95140	6%	0	0%	1400246	90%
Tai Poutini Polytechnic	61053	4%	90694	7%	5643	0%	1234564	89%
Te Wananga O Aotearoa	13612	1%	164074	8%	214748	10%	1694814	81%
Te Whare Wananga O Awanuiarangi	55311	5%	2646	0%	53020	5%	1048757	90%
The Open Polytechnic of New Zealand	215304	23%	34266	4%	48794	5%	652372	69%
Unitec New Zealand	123193	8%	159596	10%	447147	28%	864186	54%
Universal College of Learning	242816	15%	601888	37%	2520	0%	763290	47%
University of Auckland	134542	8%	84098	5%	348201	20%	1189835	68%
University of Canterbury	145596	11%	172139	13%	181002	14%	793499	61%
University of Otago	85838	7%	125139	10%	312476	24%	776979	60%
University of Waikato	86276	7%	76228	6%	130718	10%	989452	77%
Victoria University of Wellington	365103	21%	188482	11%	298643	17%	875762	51%
Waiariki Institute of Technology	50706	4%	182505	15%	0	0%	993457	81%
Waikato Institute of Technology	25731	3%	30232	3%	0	0%	894773	94%
Wellington Institute of Technology	139010	10%	248599	19%	0	0%	946973	71%
Western Institute of Technology Taranaki	427593	15%	231716	8%	131819	5%	2018734	72%
Whitireia Community Polytechnic	272233	12%	89978	4%	151728	7%	1753621	77%
Average	181248	10%	173484	11%	115870	7%	1346179	72%

Table 2 – Allocation of space

Tertiary Institution	Number of Links	Text	Text %	Graphics	Graphics %	lcons	lcons %	Design Space	Design Space %
Aoraki Polytechnic	68	3632592	36.3%	67416	0.7%	0	0.0%	6308674	63.0%
Auckland University of Technology	51	178878	14.9%	89240	7.4%	75033	6.3%	856197	71.4%
Bay of Plenty Polytechnic	23	118496	8.0%	0	0.0%	90300	6.1%	1265118	85.8%
Christchurch Polytechnic Institute of Technology	29	132582	13.2%	110874	11.1%	98440	9.8%	659382	65.9%
Eastern Institute of Technology	37	643033	38.2%	85050	5.1%	16050	1.0%	938779	55.8%
Lincoln University	37	274485	19.4%	8586	0.6%	60441	4.3%	1068932	75.7%
Manukau Institute of Technology	41	656117	48.5%	0	0.0%	6664	0.5%	689559	51.0%
Massey University	47	615775	25.7%	64771	2.7%	22763	1.0%	1691289	70.6%
Nelson Marlborough Institute of Technology	29	266160	27.3%	55864	5.7%	14352	1.5%	640314	65.6%
Northland Polytechnic	34	449749	21.2%	152012	7.2%	135608	6.4%	1388127	65.3%
Otago Polytechnic	31	89228	9.4%	8192	0.9%	17424	1.8%	835892	87.9%
Southern Institute of Technology	22	128208	8.3%	26595	1.7%	41202	2.7%	1351673	87.3%
Tai Poutini Polytechnic	4	384002	27.6%	45540	3.3%	4239	0.3%	958173	68.8%
Te Wananga O Aotearoa	19	425306	20.4%	380616	18.2%	14652	0.7%	1266674	60.7%
Te Whare Wananga O Awanuiarangi	4	184837	15.9%	187500	16.2%	8372	0.7%	779025	67.2%
The Open Polytechnic of New Zealand	51	199596	21.0%	8250	0.9%	36386	3.8%	706504	74.3%
Unitec New Zealand	67	542135	34.0%	123913	7.8%	6594	0.4%	921480	57.8%
Universal College of Learning	16	915290	56.8%	0	0.0%	0	0.0%	695224	43.2%
University of Auckland	60	409531	23.3%	121624	6.9%	8694	0.5%	1216827	69.3%
University of Canterbury	50	299322	23.2%	64875	5.0%	22304	1.7%	905735	70.1%
University of Otago	47	474376	36.5%	98792	7.6%	5280	0.4%	721984	55.5%
University of Waikato	45	306874	23.9%	136872	10.7%	40402	3.1%	798526	62.3%
Victoria University of Wellington	51	795333	46.0%	0	0.0%	10625	0.6%	922032	53.4%
Waiariki Institute of Technology	16	250929	20.5%	89600	7.3%	0	0.0%	886139	72.2%
Waikato Institute of Technology	34	136477	14.4%	45672	4.8%	0	0.0%	768587	80.8%
Wellington Institute of Technology	38	410733	30.8%	32738	2.5%	21087	1.6%	870024	65.2%
Western Institute of Technology Taranaki	43	713360	25.4%	134920	4.8%	0	0.0%	1961582	69.8%
Whitireia Community Polytechnic	48	469232	20.7%	32000	1.4%	54531	2.4%	1711797	75.5%
Average	37	503665.57	25%	77554	5%	28980.10714	2%	1206580.321	68%

Table 3 - Number of Links, Text/Graphics/Icons

Tertiary Institution	Facebook	Blog	Twitter	RSS	Flickr	Youtube	
Bay of Plenty Polytechnic	1	0	1	1	1	1	5
Northland Polytechnic	1	0	1	1	1	1	5
Unitec New Zealand	1	0	1	0	1	1	4
Whitireia Community Polytechnic	1	1	1	0	0	1	4
Lincoln University	1	0	1	1	0	0	3
Massey University	1	1	1	0	0	0	3
Te Wananga O Aotearoa	1	0	1	0	0	1	3
University of Canterbury	1	0	0	1	0	1	3
Western Institute of Technology Taranaki	1	0	1	1	0	0	3
Aoraki Polytechnic	1	0	1	0	0	1	3
Tai Poutini Polytechnic	1	0	1	0	0	0	2
University of Auckland	0	1	0	1	0	0	2
University of Waikato	1	0	0	0	1	0	2
Eastern Institute of Technology	0	1	0	0	0	0	1
Manukau Institute of Technology	0	0	0	1	0	0	1
Auckland University of Technology	0	0	0	1	0	0	1
Christchurch Polytechnic Institute of Technology	0	1	0	0	0	0	1
University of Otago	0	0	0	1	0	0	1
Nelson Marlborough Institute of Technology	0	0	0	0	0	0	0
Otago Polytechnic	0	0	0	0	0	0	0
Southern Institute of Technology	0	0	0	0	0	0	0
Te Whare Wananga O Awanuiarangi	0	0	0	0	0	0	0
The Open Polytechnic of New Zealand	0	0	0	0	0	0	0
Universal College of Learning	0	0	0	0	0	0	0
Victoria University of Wellington	0	0	0	0	0	0	0
Waiariki Institute of Technology	0	0	0	0	0	0	0
Waikato Institute of Technology	0	0	0	0	0	0	0
Wellington Institute of Technology	0	0	0	0	0	0	0
Total	12	5	10	9	4	7	0
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Table 4 - Web 2.0 and Social Media

Tertiary Institution	Pixels	Percentage of page
University of Waikato	20139	1.57%
University of Canterbury	9504	0.74%
Victoria University of Wellington	4960	0.29%
Aoraki Polytechnic	0	
Auckland University of Technology	0	
Bay of Plenty Polytechnic	0	
Christchurch Polytechnic Institute of Technology	0	
Eastern Institute of Technology	0	
Lincoln University	0	
Manukau Institute of Technology	0	
Massey University	0	
Nelson Marlborough Institute of Technology	0	
Northland Polytechnic	0	
Otago Polytechnic	0	
Southern Institute of Technology	0	
Tai Poutini Polytechnic	0	
Te Wananga O Aotearoa	0	
Te Whare Wananga O Awanuiarangi	0	
The Open Polytechnic of New Zealand	0	
Unitec New Zealand	0	
Universal College of Learning	0	
University of Auckland	0	
University of Otago	0	
Waiariki Institute of Technology	0	
Waikato Institute of Technology	0	
Wellington Institute of Technology	0	
Western Institute of Technology Taranaki	0	
Whitireia Community Polytechnic	0	
Figure 12 - Research help		

Jessica Howie - 300093286

Word Count – 10,955 excluding references and appendices