Managing information overload: Insights and recommendations into how high school students select and evaluate Internet-based multimodal texts for their learning

by

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Chapter One - Arriving at My Project

Our Digital Age and Education

During the years it has been around, the Internet has transformed how we engage with information, it is contributing to the transformation of our economy, it has transformed how we communicate with each other, and it is in the process of transforming our education system. In fact, the Internet has become so critical to the function of our society that British Columbia's Ministry of Education has decided to prioritize "increased Internet connectivity" as part of its new education plan ("Personalized learning in BC ", n.d., p. 7). As our society adjusts to these transformations, the BC government is facing pressure to “moderniz[e] education so it can adapt and respond to students’ needs” (ibid., p. 3). Other jurisdictions are facing similar pressure (“Alberta initiative for school improvement: Personalized learning”, n.d.; “21st Century education in New Brunswick, Canada”, 2010). It is important that any changes made to curriculum, especially as it pertains to the use of digital technology, be based on careful reflection.

As one of the many stakeholders in our public education system, the business community is attempting to compensate for disruptions to traditional commerce caused by the Internet and they are looking to the public education system to provide students with the skills necessary to help them become more competitive in today's global market. To this end, they are pressuring the government of British Columbia to modify the K-12 curriculum in order to better prepare students for employment in a knowledge-based economy (Premier's Technology Council, 2010; "BC's Education Plan", 2012, p.3). The principal change that is being requested to the K-12 curriculum is a foregrounding of knowledge creation, as it is forecasted to be the main economic resource produced by workers in the future (Media Awareness Network, 2010, p. 4; Premiers Technology Council, 2010, p. 7). Although not all students will be needed as "knowledge produces and innovators in society" (Gee, 2012, p. 29), the government has

proceeded to consult with stakeholders (beginning in 2010) on how to update the existing curriculum (British Columbia Ministry of Education, 2012, p. 2).

Considering how best to alter curriculum in order to prepare students for employment in a knowledge-based economy is made difficult by the fact that it is difficult to predict how exactly new technology will change the way we work with information in the future. For example, it was difficult to predict thirty years ago the ways that computers would alter our day to day lives in the present and the ways that we work with information. Some of the impetus to change existing curriculum derives from the seeming differences between the ways that information manipulation in modern employment settings is largely located in computers whereas information manipulation in the classroom is largely located in paper-based sources (textbooks and notebooks). Because there is a continuity of meaning-making processes (reading and writing) between these two platforms, service workers in our emerging economy will need to be provided with "basic literacy and numeracy" skills while technical workers will need to acquire "deeper and higher quality learning" in order to leverage "technical knowledge and skills in their work" (Gee, 2012, p. 29). This idea serves as the basis for a connection between innovation in curriculum design and the emergence of new technology and technological process in the economy.

While there is no indication that our current curriculum is deficient in providing students with basic literacy and numeracy skills or with the skills to develop deeper and higher quality learning, the Government of British Columbia has concluded from its consultations that “the Province needs a more flexible curriculum that prescribes less and enables more, for both teachers and students,” which they clarify by adding that “an education system redesigned with 21st century priorities in mind must remove the barriers that limit teachers' ability to innovate and personalize learning based on students' needs and the community context” (British Columbia Ministry of Education, 2012, p. 2). While the government's conclusion does not imply a specific change to the core topics that comprise the

curriculum, it does make way for alternative ways of engaging with these topics. In particular, it prioritizes the use of technology in education in order to better prepare "students to thrive in an increasingly digital world" by giving them "more opportunity to develop the competencies needed to use current and emerging technologies effectively, both in school and in life" ("Personalized learning in BC", n.d., p. 7). Reasonably, this means that students under the new education plan will be supported in developing technological competencies and that they will be supported in using digital technology (including the Internet) for their learning.

It should be noted, however, that many students are already using the Internet for their learning in present day classrooms. Because there is such an abundance of information available on the Internet, it can be a challenge to locate the best sources of information that relate to a specific topic of interest. Search engines help reduce the difficulty of accessing information from the Internet. To do this, search engines perform two significant functions. First, they catalogue the links/addresses of various multimodal texts stored on the networked computers that comprise the Internet. Second, search engines use complex sorting algorithms to select portions of the catalogued texts according to specified search parameters (the topic of interest) and displays them (the results list). While not all students currently have access to computers with Internet connections in their classrooms, many do and they have already developed techniques for discovering Internet-based resources for their learning.

If students are to make effective use of the Internet for their learning, then they must be supported in developing the skills for selecting multimodal documents from the Internet as part of their everyday learning. Although using a search engine to access information from the Internet may seem simple to some students (and teachers), obtaining a list of search results is only the first part of accessing information from the Internet. Students must then choose from the results-list those documents that they will use for their learning. This is an aspect of Internet-based learning that moves beyond the

technological competency of performing a search and requires the application of critical thought. Once a number of documents have been selected from the results list, it is necessary to determine whether they pertain to the topic of interest directly or merely tangentially. Furthermore, because there are a large number of documents accessible over the Internet, attempting to look through each document connected to a search query would take many hours. Search engines like Google make it seem almost trivial to locate information stored on the Internet and, consequently, the speed of finding a source of information can sometimes become more important than finding the most useful/accurate source of information. This is problematic because critical reflection on the usefulness of a document can be diminished in order to prioritize quickly locating a document. Supporting students in using the Internet for their learning involves more than just providing an Internet connection in classrooms.

Today's students are entering the classroom having been born into an era of pervasive computerization. Research suggests that “the next generation of adults already recognizes the electronic medium as their chief source of textual information” (Patterson, Stokes-Bennet, Siemens, & Nahachewsky, 2010, p. 67), and this is adding to the pressure placed on the BC government to have computers play a more central role in education. The Ministry of Education is responding to this growing urgency by, in part, emphasising a greater portion of student learning on computerized devices in their new education plan ("BC's education Plan", n.d., p. 7). As a result, it is critical that we examine how students interact with digital multimodal documents for their learning. Arriving at a nuanced understanding of the techniques that students use when interacting with digital multimodal documents includes learning about students' perceptions of digital texts, the ways that they interact with different textual modes (video, images, printed text, and hyperlinks), the values that they place on different text modes (informative, entertainment value, accessible, etc), preferences they may have for different text modes, and the processes they use when viewing different text modes for the purposes of clarifying and

retaining information.

Since the majority of knowledge-intensive industries that students will be employed in once finishing school do not yet exist (or are only in nascent forms), the present changes occurring to curriculum are focused on producing students "who are able to adapt to rapidly changing situations, who are creative, independent and who have broadly based skills that can be used as a basis for specific job skills training" (George 2006, p. 592). It follows then, that those students who will be most successful in this anticipated labour market will have developed, through the support of their educations, the ability to leverage the Internet in order to locate, and make use of, materials for their learning. Helping students prepare for this future begins by understanding the practices students currently use when selecting and evaluating digital (Internet-based) multimodal documents for their learning.

Why I Did This Project

The purpose of my project was to arrive at an understanding of the practices that students use when selecting and evaluating digital (Internet-based) multimodal documents for their learning. To accomplish this aim, I decided that I would interview a selection of students from a local high school who regularly used computers in their everyday classroom learning. I had the opportunity to attend a presentation by the superintendent of SD64 in which he discussed the ways that his district used information computer technology to facilitate students' personalized learning programs. After expressing my interest in interviewing a selection of his students on their practices for selecting and evaluating digital multimodal documents for learning, I was invited to formally build my research proposal around the S.H.I.F.T. program (a multi-grade classroom where students pursue individual learning programs on computers) at Gulf Islands Senior Secondary. The insights that I have gained from these interviews are the subject of this project.

In some small part, the research-based ideas that I am presenting in this paper are rooted in my

fascination with computers. Being born at the end of the 1970s, I have grown up watching computers evolve into ever smaller and faster versions of themselves. As computers have evolved, I have noticed that my own relationship with computers (the ways that I use them and interact with them) has also evolved. Although I always found computers fascinating in and of themselves, the advent of the Internet gave new purpose to owning a computer. Suddenly a world of digital information was at my fingertips and I started accessing information and ideas that I might not have normally encountered during the course of my formal education. I could see that it would only be a matter of time before computers and the Internet would have a central function in all matters of education.

Once I entered graduate school, I started to reflect on how the technology I use suggests particular reading patterns and relationships to texts. Especially with the acquisition of my first tablet computer, I recognized that my own reading of texts on a computer utilized additional skills and techniques beyond those that I personally use when reading linear print-based texts (i.e. traditional books). Computers and web-browsers, including Internet search technologies, suggest particular usage patterns that do not readily apply to traditional paper-based books. For example, I cannot simply flip open a paper-based book to a piece of information I am looking for if I have not already found that piece of information ahead of time. This characteristic of a book informs the techniques I use to locate information within a book as well as the processes I use when reading a book. These processes may include using a highlighter for marking textual passages or a using a notepad for making notes. In contrast, computers and web-browsers allow me to create links to information within a page and to pinpoint (using search functionality) specific pieces of information without surveying the entire document beforehand.

I also started to realize that the technology I was using was affecting my thinking process. I have become gradually aware of a general impatience that I have developed with the task of locating

information on any particular topic. The more I used search engines to locate information, the more I became accustomed to rapidly locating the information that I needed. When I was completing assignments for my undergraduate degrees, I found myself using scholarly databases to locate articles on specific topics. The idea of going down to the physical racks of journals to look through a publication dedicated to a core topic seemed onerous. I even got to the point where I would use online journal databases to look up the source materials for quotes I had read in other articles so that I could incorporate these same quotes into my own work later. I was not interested in reading the entire source article. Instead, I only read enough to ensure that I could incorporate the salient quote into my own work in a meaningful way. In short, completing assignments had become 'just a game', or an adapted set of learning and compositional strategies for me. My project, and the research that I have performed for it, examines other students' (selected high school students') online textual and accompanying learning practices. I have done this in order to provide situated insights and recommendations to educators into how selected high school students select and evaluate Internet-based multimodal texts for their learning. Such considerations have implications for the way we teach and for our changing education system.

The guiding question for my project inquiry was: How do students develop an understanding of the digital multimodal screen for their learning?

My sub-questions included:

How do students select Internet-based multimodal texts for their learning?

How do students evaluate the usefulness of Internet-based multimodal texts for their learning?

Chapter Two - Literature Review

The Social Nature of the Internet

The Internet is a global phenomenon that is in a constant state of emergence. When I first obtained an Internet connection in 1998, one of the defining characteristics of the Internet was the relative anonymity that it afforded users. That is to say, while the Internet of the 1990s facilitated interaction between individuals on a global scale, one could engage with information on the Internet without necessarily feeling connected to a social group of Internet users. Today, the Internet's pervasively social nature is its most defining characteristic. Social media platforms such as Facebook, Twitter, and Google+ (just to name a few) have linked Internet users together in a massive conversation where information is shared, collaboratively created, and iterated upon. Unlike in the early days of the Internet, a person's social profile now follows them around from website to website through the use of social media plugins (digital linkages to social media platforms) and this allows their various interactions to be registered and shared with a community of friends. The Internet of today is not the bastion of anonymity that it used to be and this means that an examination of how students select and evaluate Internet-based texts means that it is necessary to examine the ways that social interaction on the Internet impacts reading and writing processes of digital text (I am broadly defining 'text' following Jewitt and Kress (2003) to be any information format having the purpose of transmitting ideas).

Companies such as Google and Facebook are continually innovating to facilitate and expose social interaction on the Internet. Some of their more recent tools for facilitating social interaction include 'like' buttons that users can click on to endorse a site or product, and text areas to compose reviews linked to their social identity. While these tools primarily serve marketing interests, they do convey to users a sense of belonging to a larger community of viewers. These endorsements and reviews are stored in these various companies information databases and later sold to advertising companies

wishing to promote similar products to identifiable groups of friends (by featuring personalized reviews). Even more importantly, these endorsements and reviews are now also used to personalize our search results ("Facts about Google and competition", n.d., http://www.google.com/competition/betteranswers.html; "Frequently asked questions about creating a Google account ", n.d., https://support.google.com/accounts/answer/1728595). Since the information we access on the Internet is shaped by our digital history of social interaction, a description of how students select and evaluate Internet-based resources for their learning must also take into consideration how their collective previous experiences inform their present interactions with digital multimodal texts.

Arriving at a description of how students select and evaluate Internet-based resources for their learning requires a framework for describing their various interactions with the defining characteristics of an Internet-based multimodal document. In the case of this project, the defining characteristics (or modes) of an Internet-based document include printed text, hyperlinks (being an augmentation of printed text), images, audio, and video (being a combination of the aforementioned). Making meaning (reading) from these various modes is the job of the viewer. As such, literacy is a useful framework for describing the processes that students use when selecting and evaluating Internet-based resources for their learning. When considered in relation to the social nature of the Internet and the social nature of the Internet, then a sociocultural approach to literacy is the most useful place for this project to begin.

A Sociocultural Approach to Literacy

James Paul Gee's sociocultural approach to literacy provides a useful framework for understanding the social and cultural aspects of selecting and evaluating Internet-based documents for learning. The premise of his sociocultural approach to literacy is that reading and writing "are almost always fully integrated with and interwoven into the very texture of wider practices that involve

interaction, values and beliefs" (Gee, 2012, p. 41). This approach to literacy contrasts with a more traditional account of reading and writing that situates it as a process "in the individual person rather than in society" (Gee, 2012, p. 26).

Whereas the traditional understanding of reading and writing framed these processes as the encoding and decoding of information without explicitly acknowledging the social nature of language, Gee reconciles the social nature of language with the processes of reading and writing by connecting literacy to social identities he calls Discourses (with a capital D). For Gee, Discourses are "composed of distinctive ways of speaking/listening and often, too, writing/reading *coupled* with distinctive ways of acting, interacting, valuing, feeling, dressing, thinking... so as to enact specific socially recognizable identities engaged in specific socially recognizable activities" (Gee, 2012, p. 152). This perspective suggests that reading and writing practices cannot be meaningfully understood if they are abstracted away from the attitudes and motivations behind these practices as well as the distinctive ways of being, thinking, acting, and feeling that define the context of specific literacy practices.

Gee distinguishes between two main types of Discourse. A primary Discourse is the one that is developed within our earliest social environment (the home) and encapsulates the "culturally distinctive ways of being an 'everyday person'" (2012, p. 135). Ways of 'being' outside of the context of a primary Discourse are all referred to by Gee as secondary Discourses. These are acquired "within a more 'public sphere' than our initial socializing group" (2012, p. 154) and refer to the practices of being an 'everyday person' in specific contexts. Most importantly to Gee, secondary Discourses "involve by definition interaction with people with whom one is either not 'intimate'... or they involve interactions where one is being 'formal', that is, taking on an identity that transcends the family or primary socializing group" (2012, p. 172). Consequently, students who participate in social interactions on the Internet are working within a variety of secondary Discourses. It is important to consider how students' membership in

Internet-specific secondary Discourses impact on classroom-specific secondary Discourses if we are to properly understand the ways that they interact with Internet-based texts in the classroom.

Although the concept of primary and secondary Discourses seems to neatly compartmentalize social interactions into discrete ways of interacting in the world, Gee acknowledges that there are "complex relationships between people's primary Discourses and ... their academic, institutional, and community-based secondary Discourses" (2012, p. 155). This means that the boundaries between Discourses are fluid and that new secondary Discourses may arise that are the combination of elements from two or more different Discourses. It stands to reason then, that where technological advancements disrupt/develop new established secondary Discourses, the result will most likely be the emergence of new secondary Discourses that embody elements of the former Discourses.

One further implication of secondary Discourses that arises from Gee's work is that secondary Discourses are 'purpose-oriented'. 'Purpose', as it is being used here, refers to a stabilizing force that maintains a common ontological framework for a social group as they interact with each other. 'Purpose-orientation' embodies the notion that secondary Discourses integrate within them socially meaningful goals as well as the mechanisms for achieving these goals. That is to say, secondary Discourses organize social and cultural relations around specific priorities. This concept is similar to Gee's notion of Discourses as being implicated in *identity* but whereas *identity* encapsulates ways of being recognizable as a "member of a socially meaningful group" (1999, p. 26), *purpose-orientation* describes how a social group encourages its membership to align their expressions of *identity* with a specific way of being in the world. While a student's identity is mediated by contextually appropriate secondary Discourses, it is the 'purpose-orientation' of these Discourses that require the *identity* of 'student' to be expressed in particular ways. Gee comes closest to touching on this idea with his discussion of "affinity spaces", which are a “place, or set of places, where people can affiliate with others... based on shared activities,

interests, and goals" (2004, p. 67). Gee's conceptualization of 'affinity spaces' does not speak to the idea that social groups contain within them mechanisms for enforcing specific expressions of *identity* in order to maintain membership. Rather, membership is cast as a voluntary action. The purpose-orientation of a secondary Discourse includes the ideas of friendship, being a 'student', or engaging in elaborate roleplaying games.

Gee's concept of Discourse is an important tool for developing an understanding of how students select and evaluate Internet-based documents for their learning because it foregrounds the social nature of 'literacy' and the social nature of language. It is Gee's view that "language makes no sense outside of Discourses" (2012, p. 3), and that, by extension, 'literacy' is the "[m]astery of a secondary Discourse involving print in some fashion (which is almost all of them in a modern society)" (2012, p. 173). Literacy then, involves more than reading and writing, but is any instance of participation within a community of meaning. Consequently, by defining literacy relative to Discourse, Gee problematizes any straight forward comparison of literacy practices in the classroom and the home because these separate contexts employ distinct secondary Discourses with distinct purpose-orientations. Similarly, Gee problematizes comparisons of literacy practices regarding the printed page and Internet-based digital multimodal texts. Both the printed page and Internet-based texts are situated in distinct social practices described by unique secondary Discourses.

Concerning the classroom, Gee asserts that "[s]chool honors and rewards a narrow range of literacy practices" (2011, p. 65). This means that the ways that students engage with Internet-based multimodal texts must be seen as specific to the school context and linked to the exigencies of a school-specific secondary Discourse. For example, students' literacy practices may be enacted in response to proscriptions against interacting with specific information sources or their literacy practices may have evolved in response to time pressures that are unique to the school context. In the home, reading may

be a solitary recreational exercise whereas reading at school may be driven by a need to acquire specific information. This is an idea echoed by Kathy Mills in her discussion about the established disconnect between out-of-school literacy practices and those situated in the classroom (2010, p. 40). Since Discourses embody ways of thinking/acting in specific social contexts, it becomes possible to consider that students' Internet-based literacy practices at school (a specific literacy) may be deliberately enacted by students in response to school-specific environmental conditions.

New Literacies

Since Discourses embody the values, attitudes, and motivations of a social group, then understanding literacy (defined by Gee as 'mastery of a secondary Discourse) involving the Internet must require an examination of both the social context in which students engage with Internet-based documents and the technological aspects of engaging with digital multimodal documents. The technological aspects of interest to this research include students' socially-mediated techniques of accessing information on the Internet and how students select and evaluate the usefulness of an information source. This research also seeks to examine how the computer technology being used informs the specific attitudes and beliefs governing students' literacy practices in the classroom.

While Gee's sociocultural framework provides a mechanism for compartmentalizing literacy practices within specific social contexts (spaces of social interaction), it does not provide an explicit mechanism for tracking changes in literacy practices over time within an established social context. In particular, Gee's framework does not readily provide insight into how technology impacts on literacy practices within a conventional classroom environment that emphasises literacy practices using paper-based texts. This is where Lankshear's and Knobel's 'new literacies' framework is useful.

Leveraging the work done by Gee on sociocultural theory, Lankshear and Knobel also define literacy with respect to Discourses. Literacy is socially situated and evolves within a group through

specific ways of 'being' in the world. However, because they are interested in understanding the ways that technology impacts on the way that information is accessed and shared, their definition of literacy more narrowly defines how information is distributed. Specifically, they define literacies as "socially recognized ways in which people generate, communicate, and negotiate meanings, as members of Discourses, through the medium of encoded texts" (2011, p. 33). It is important to note that this definition of literacy acknowledges the social nature of reading and writing, while steering clear of a more traditional notion that meanings are stabilized and preserved within encoded texts. Lankshear and Knobel make this distinction clear through their definition of 'encoded texts' as "texts that have been rendered in a form that allows them to be retrieved, worked with, and made available independently of the physical presence of another person" (2011, p. 40). This definition of 'encoded text' is useful as it encompasses a wide range of Internet-based texts as well as paper-based texts that students may encounter in a classroom context.

Beyond their more contextually useful (for this research) definition of literacy, Lankshear's and Knobel's definition of what makes a literacy 'new' is also important as it provides a basis for contrasting Internet-based reading and writing practices with more conventional paper-based reading and writing practices. They establish a general temporal reference point for what they mean by 'new' by aligning this designation with the differences between 'modernism' and 'postmodernism'. Here, 'new' is associated with postmodernism and is contrasted with 'conventional', which they associate with modernism (2011, p. 53). They make clear what they mean by their association with modernism and postmodernism in their suggestion that the most defining characteristic of modernism is 'a tendency or a default toward thinking, acting, and organizing life around ideas of singularity, centeredness, enclosure, [and] individualization" (2011, p. 52). This means that for Lankshear and Knobel, conventional (modernist) literacies are structured around individual approaches to reading and writing that emphasize the

centered nature of meaning as it is encapsulated within texts. In contrast, these authors see postmodernism as being characterized by 'a tendency toward thinking, acting, and organizing life around the notions of multiplicity, flexibility, dispersion, [and] non-linearity" (ibid.). It follows then that for Lankshear and Knobel, new (postmodernist) literacies represent an acknowledgement of the complexity in the way that meaning is produced and distributed within a social group. Rather than reading and writing being a process centered within the individual, reading and writing is seen as a function of new forms of social practice with meaning evolving along a non-linear trajectory.

Lankshear and Knobel provide a further elaboration on their framework of new literacies that makes it easier to classify what constitutes a 'new' literacy. They do this by separating 'new' literacies out into two mutually implicated categories. In the first are those literacies that contain new "ethos stuff", and in the second are those that contain new "technical stuff". The term 'stuff' is an unfortunate word in that it does not really convey a specific meaning, but the new "technical stuff" that they focus on is primarily digital. They support this distinction by contrasting "screens and pixels" with "paper and type", "digital code" with "material print", and "seamlessly multimodal" with "distinct processes for distinct modes (text, image, sound)" (2011, p. 29). As such, 'stuff' in this case refers to the defining characteristics of the digital electronic technology that are used for transmitting information. This elaboration should also include the contrast between 'online' and 'offline' as this last distinction aptly captures the social aspect of engaging with information live on the Internet (real-time formats) vs. engaging with information in an offline format (static formats). The authors' conceptualization of new 'ethos stuff' is defined relative to "different kinds of social and cultural relations" that "flow out of different kinds of priorities and values" (ibid.). As a result, the new 'stuff' of new literacies aligns technological change with an evolution in literacy practices and values.

By examining the practices, values, and motivations (or Discourses) that students work within

when selecting and evaluating Internet-based resources for their learning through the lens of new literacies, it is possible to focus on the new ethos 'stuff' and the new technical 'stuff' that students leverage when negotiating meaning with Internet-based texts and to focus on how this 'stuff' differs from the 'stuff' of conventional literacy practices in the classroom. Although there are likely to be countless configurations of new technical 'stuff' and new ethos 'stuff', the new literacy practices of interest to this research are primarily those concerned with the ways that students select and evaluate Internet-based multimodal documents. This includes the specific Internet-based tools that students use to access digital texts on the Internet such as search engines and social networking platforms. It also includes the range of values that govern how students use this technical 'stuff'.

Digital Literacies

The ways that students select and evaluate Internet-based documents, as an aspect of new literacies, is encapsulated by the concept of 'digital literacy'. The term 'digital literacy' is meant to highlight literacy that is mediated by digital technology as being different from conventional print-based literacy. However, 'digital literacy', like 'computer literacy', are terms that have found their way into everyday terminology and often refer to a general functional ability to use technology. For instance, I have often heard my parents refer to someone who can install an operating system on their computer as being 'digitally literate'. It is a distinction that seems to draw attention to a separation of abilities between themselves and those who have grown up using and manipulating computers. They seem to use this term interchangeably with that of being 'computer literate'. However, 'digital literacy' as I am using it from this point forward, specifically refers to the new technical 'stuff' and new ethos 'stuff' that are anticipated by curriculum developers to be relevant to students in an information-based economy.

Because the technology that we use in our modern society is constantly evolving, it is tricky to arrive at a stable and universal definition of 'digital literacy' that is applicable across all social and

situational contexts, especially if the formulation of this definition attempts to encapsulate the shifting intersections of the technical 'stuff' and ethos 'stuff' that are assumed to be common to all contexts. Every enactment of digital literacy will involve the unique expression of values (a Discourse) that are particular to the social context in which it is situated. As such, a broad definition of digital literacy can only serve as a flexible framework that hints at possible usage patterns within a general context.

Paul Gilster (1997; in Pool 1997) defined 'digital literacy' as "the ability to understand and use information in multiple formats from a wide variety of sources when it is presented via computers" (Gilster; in Pool 1997, p. 6). This is an example of a definition that attempts to provide a general understanding of the technical 'stuff' (information formats and sources; computers) as well as a general understanding of the ethos 'stuff' (ability to understand; use) that make up digital literacy. This is a useful starting point for understanding digital literacy but it suffers from the omission of the context in which digital literacy is to be enacted or the purpose-orientation (priority) of digital literacy. The approach taken by the British Columbia Ministry of Education in their new education plan is to be more specific about the values that are important to their understanding of digital literacy, to specify the context of enactment for digital literacy, and to state the purpose-orientation of digital literacy. For the Ministry, digital literacy is:

> “the interest, attitude and ability of individuals to appropriately use digital technology and communication tools to access, manage, integrate, analyze and evaluate information, construct new knowledge, create and communicate with others in order to participate effectively in society” (“Digital Literacy Standards”, n.d.).

This definition names the technical 'stuff' (digital technology; communication tools) in sufficiently general terms so as to encompass current and future computer technology. It also names the ethos 'stuff' (access; manage; integrate; analyze; evaluate; construct; communicate) in sufficiently

general terms. The more notable aspect of this definition is its attempt to also name the context in which digital literacy is to be enacted (everyday society) and its purpose-orientation (effective participation).

This above definition of digital literacy is adequate as a general definition and serves as a useful starting point in this research for describing enactments of digital literacy by students in a classroom context - especially since this is the definition that will inform future curriculum innovations in the province of BC. However, there is a problem with this definition (and for this research) in that it names its context as 'society' and this research is interested in the ways that students enact digital literacies within an institutional (classroom) context. This distinction is important because the classroom has a distinct configuration of values and priorities that governs enactments of digital literacy. Whereas 'society' includes (but is not limited to) configurations of digital literacy for recreational endeavours that are not necessarily bounded by rigid time constraints and achievement measures, the classroom is a context that is always governed by its accountability to a series of constraints based on available funding and accountability to taxpayers. This means that there is a mismatch between the contexts stated in the definition and in which digital literacy has been observed in this research that requires closer scrutiny since the Discourses that govern a classroom context are different from the Discourses at play in everyday society. That is, the configuration of values, structures, and priorities in a classroom (grading & assignment completion; copyright & plagiarism; timetabling – which cannot be easily separated out) are sufficiently specialized as to make enactments of digital literacy in the classroom worthy of special consideration.

That enactments of digital literacy in the classroom should be worthy of special consideration is made clearer by considering that a 'digital literacy' employed by a group of Live Action Role Playing enthusiasts will differ from a 'digital literacy' employed in a corporate software development

environment, which in turn, will differ from a 'digital literacy' employed in a high school chemistry class. Each of these different contexts employs separate secondary Discourses with their separate attendant ways of being in the world. This means that the values, attitudes, and motivations that govern their digital interactions and practices will also be distinct. The application of a general definition of digital literacy to these separate contexts misses the fact that these contexts are governed by distinct purpose orientations.

While it is possible to see that the BC Ministry of Education's definition of digital literacy (above) is meant to convey a sense of confidence that the digital literacy skills taught within the institutional space will be applicable to everyday life in society, the fact remains that the act of 'teaching' students digital literacy skills will only occur within the formalized school setting using school-specific Discourses. As such, a formalized instruction in digital literacy will be oriented to in-school priorities and, at best, be tangentially related to enactments of digital literacy in other contexts. Furthermore, this definition attempts to suggest that there is a way to "appropriately" use technology in order to "participate effectively in society" but ignores the fact that different social contexts (and secondary Discourses) even within everyday society require unique practices in order to interact "appropriately." As such, it is necessary to acknowledge that 'appropriate' applications of the technical 'stuff' and ethos 'stuff' of a digital literacy are contingent on its context. It is therefore questionable whether students' formalized development of 'digital literacy' within a school context will in fact enable them to "participate effectively in society" without also hybridizing the teaching process by placing students in authentic social contexts unbounded by the exigencies of formalized educational spaces and Discourses.

The Internet and Digital Literacy

One of the most important aspects of digital literacy concerning the Internet is being able to locate information on a desired topic. The Internet is a vast network of separately operated servers

distributed across the globe that together contain over one trillion pages of digital information between them (Alpert, J., Hajaj, N., 2008). Reading through each of these pages and keeping track of their Internet Protocol (IP) Addresses is well beyond the ability of most individuals and so this process is automated by tools called search engines. According to Lankshear and Knobel, "[a] search engine... helps optimize our internet experience by helping us find what we are looking for in a way that maximizes the likelihood of us getting to 'the best information' as efficiently as possible" (2011, p. 70). This automation allows someone looking for information on the Internet to focus on this task without needing to know where the information is actually stored. To find information, one need only type in a topic of interest into the search engine (search parameters) and a list of results (list-items) is displayed on the computer screen. Since the BC Ministry of Education's conceptualization of digital literacy includes the "use [of] digital technology... to access, manage, integrate, analyze and evaluate information," then using a search engine is one of the most important skills that a student should develop since this is the only real way to *access* information.

The above description of how to use a search engine seems to imply that the task of locating information on a particular topic is relatively straight forward. However, the list of information sources (indexed pages) presented by the search engine does not necessarily contain list-items that relate highly to the search topic that was queried. This means that students are required to assess the usefulness of the various list-items that have been returned by the search engine in order to narrow in on the information they are looking for. This can be a particularly daunting task given that a typical search often returns over a thousand possible results for any set of search parameters (one or more topic keywords in the query).

It is useful at this juncture to note that the process of searching for information on the Internet is similar to finding information at a library using card catalogues. An individual interested in locating

information by on a particular topic would look through a collection of index cards listing the title of a book as well as a small summary of the book. The key difference between the functionality of a search engine and a card catalogue is that the time required to complete this task is dramatically reduced. Having used both a card catalogue and a search engine, I can say that one consequence of reducing the amount of time needed to locate a source of information is that it I have become conditioned to expecting the information I am looking for to be available in as short a time as possible. If this is the case for other people as well, then it means that this conditioning will likely reduce the amount of effort that is dedicated to combing through search results looking for the most useful information source. Whereas a card catalogue is limited by the topic selection and book arrangement maintained by the librarian, a search engine affords the possibility of refining a search query in order to more directly target the information of interest.

Understanding the techniques that students use for parsing a list of search-results is critical to any account of how students locate information on the Internet. In particular, inquiring into the various aspects of how students select items from a search-results list is of interest in this research because it directly relates to the question of how students select digital multimodal texts for their learning. Howard Rheingold (2012) in his book Net Smart suggests that a key concept for effectively using a search engine for locating information is "attention control," which he defines as the ability "to attune to the part of your information environment that matters most and tune out what is irrelevant, at least for the purpose of your goal" (p. 42). When using a search engine, this means looking through the accompanying description for each item in the search-results list in order to tune out those items that do not directly relate to the topic of interest.

Another important aspect of how students select information on the Internet concerns how they determine the usefulness of the information that they are looking at. Understanding how students do

this is of interest in this research because it relates to the question of how students evaluate the usefulness of multimodal documents for their learning. Additionally, gaining insight into this question is complicated by the need to account for the ways that context (the classroom) is implicated in the ways that students approach this task. Lankshear and Knobel provide a starting point for examining how students evaluate the usefulness of information on the Internet by pointing to the way that information is developed and shared on Wikipedia. They argue that the information on this collaboratively-generated encyclopedia is generally perceived as useful since users share a common ethos, which they describe in the following way:

> "The ethos is to reach out to all of the web for input, through limitless participation, rather than the more traditional belief that expertise is limited and scarce, and that the right to speak truths is confined to the 'properly credentialed'. The idea is *not* that anyone's opinion is as good as anybody else's but, rather, that anyone's opinion may stand until it is overwritten by someone who believes they have a better line" (2011, p. 74).

The implication of such an approach to valuing information on the Internet is that students may be willing to unthinkingly accept what they find as true as the veracity of this information has presumably been vetted by a large online community. Furthermore, the degree to which students question the reliability of information found on the Internet will likely be a factor of how well their critical thinking skills have been developed and the attitudes of mentors (teachers) in their life toward information retrieved from the Internet.

Defining 'Digital Multimodal Text'

The increases in computer processing power and Internet connection speeds that have occurred over the last decade have facilitated the diversification of text modes that are commonly found on pages retrieved from the Internet today. Following Gunther Kress (2010), this includes, but is not limited to,

modes such as auditory speech, music, printed words (linear or hyperlinked), video, and graphic images. Any text having a combination of these modes is a multimodal text. It is also possible to include bodily movements (sign language and body language) in this broad definition of ‘multimodal text’ as captured in video. When a multimodal text is viewed on a computerized device, it becomes a digital multimodal text.

The multiplicity of modes for transmitting information on the Internet today are central to Lankshear's and Knobel's assertion that the "shift from material inscriptions to digital coding, from analogue to digital representation, has unleashed conditions and possibilities that are massively new" (Lankshear and Knobel, 2011, p. 58). Webpages in the 1990s were often limited to a combination of midi music, graphics, and printed text as these modes were all that could be managed with the technology commonly used in that period. Today, video has risen as a prominent format (see YouTube) for transmitting information and this is largely due to it being an accessible mode for quickly encoding a large quantity of information. Because there are so many modes for encoding information on the Internet, it stands to reason that students may arrive in the classroom having developed affinities for particular text modes. As an aspect of new literacy practices (digital literacy), determining how students interact with different text modes is an integral part of understanding how they select and evaluate Internet-based texts for their learning.

When it comes to understanding the way that readers interact with modes within a text, Kress' social-semiotic theory of multimodality is useful because it allows us to move beyond "the long tradition of seeing 'language' as a full means of making meaning, seeing it instead as one means among others" (2010, p. 15). Conventional literacies based on the printed page relied heavily on the use of language to convey meaning as this technology (the printed page) was limited to what could be produced with ink and paper. The digital technology of computers and the Internet allow for instances (especially in video)

where "semiotic-conceptual work... is done by means of other modes" (ibid.). But more than just being a theory of the use of modes for making meaning, Kress' theory advances the idea that meaning is derived from an encoded text according to the interests of the reader. Kress notes that, "[u]nlike the traditional page, designed with a given order/arrangement for the reader's engagement, ... [a website], which has 'visitors' rather than readers - is given an ordering by the readers' interests through their (ordering-as-) design" (2010, p. 38). This means that an examination of how students evaluate the usefulness of Internet-based texts for their learning must also include an examination of the modes that students attend to when engaging with the digital page and to understand whether they privilege some modes over others (video over text printed text).

Practice as a Function of Self-Efficacy

Understanding is a complex issue. Certainly, examining students' previous experiences with different text modes is an intuitive place to start, and the concept of self-efficacy may contribute significantly to an understanding of how students engage with texts. As Pintrich and Linnenbrink (2003) point out, students who have a strong sense of self-efficacy are "more likely to exert effort in the face of difficulty and persist at a task when they have the requisite skills" (p. 127). Considering student interaction with multimodal texts relative to self-efficacy is useful because research has shown that "self-efficacy is (1) positively related to adaptive motivational beliefs, like interest, value, utility, and positive affective reactions, and (2) negatively related to negative emotions" (Linnenbrink & Pintrich, 2003, p. 133). The higher that students' senses of self-efficacy are, the more likely they are to be interested in the subject they are studying and the more likely they are see value in exploring the subject in as thorough a way as possible. Moreover, since self-efficacy is "related to an individual's actual engagement and learning" (Linnenbrink & Pintrich, 2003, p. 121), considering ways of promoting students' self-efficacy becomes an important focus. In instances where students select some text modes and avoid others, it

may be that these students have not yet developed a strong sense of self-efficacy as a result of developing the necessary skills to work with these other modes. This may be the case in situations where students choose to view video and avoid linear printed text when exploring an unfamiliar topic. In such cases, students who have had teachers that have helped them to develop the requisite skills for working with a particular text mode are more likely to have a stronger sense of self-efficacy.

Practice as a Function of Information Overload

Another factor to account for when examining the ways that students select and evaluate Internet-based documents for their learning is that the Internet contains so many different documents that present similar information. While this concept is not new or unique to the Internet, it is nevertheless an important consideration because, as with a library card catalogue, the abundance of documents on any one topic can be overwhelming. Knowing how to deal with an abundance of information (including crafting specific search parameters and recognizing when search results may not be reflective of the desired topic) "without being overloaded with too much information is ... an essential ingredient to personal success in the twenty-first century" (Rheingold, 2012, p. 2). Furthermore, without having developed techniques to sort through documents on the Internet, it would be quite easy for students to start experiencing information overload (IO). IO is defined by Chen, Pedersen, and Murphy (2012) as “the point at which a learner’s capacity of sensory memory and working memory are exceeded, and the excessive information and stimuli from the CMC [computer-mediated communication] learning environment interfere with content learning" (p. 104). When IO interferes with students' learning, they are less able to perform deep processing of information (Angeli et al. 2003). It is therefore possible that an examination of the practices students use when locating information will turn up tendencies on the part of students to look for just the information they are interested in so as to avoid contending with an abundance of information that might not pertain to their

interests. Again, this idea is not unique to literacy practices concerning the Internet, but it is an idea that needs to be considered in order to arrive at an understanding of the ways that students select and evaluate Internet-based documents for their learning.

It was Nicholas Carr (2008) in his "Is Google Making Us Stupid" who suggested that the enormous quantity of information available on the Internet may be affecting our willingness to engage in deep sustained reading engagements with digital multimodal texts. Accepting for the moment that this may be an experience shared by many people, it is possible that this reluctance is a mental tool used to maximize interaction with the vast quantity of information returned in any one search result. That is to say, by minimizing the level of engagement with any one document, it is possible to quickly survey many documents within a relatively short period of time in order to get a better sense of what documents are worthy of a closer reading. In addition, it is possible that surface-level engagements with digital texts enable one to not feel overwhelmed by the quantity of information to be considered. It has been my personal experience that a quick perusal of the documents turned up in an Internet search will often result in me locating webpages that package information in a more succinct manner than others. Thus, quickly locating and reading information found on the Internet becomes a task of correctly crafting search queries (using the right keywords in the right order) and being able to quickly determine the usefulness of the webpages returned in the search.

The Internet and Personalized Learning

In his *End of Millennium,* Castells (2010) describes the workers best suited to a knowledge-based economy as ‘self-programmable’, which he defines as having “the capability constantly to redefine the necessary skills for a given task, and to access the sources for learning these skills” (p. 377). Castells' conceptualization of workers as being 'self-programmable' embodies the idea of independence in social contexts. This means that workers of the future will need to be able to determine for themselves what

skills/knowledge they need for a given task and to be able to seek out the information they need to learn these skills. However, their successes in seeking out the information they need will depend on their abilities to select useful resources from the vast collections of digital multimodal documents available on the Internet (and elsewhere) without becoming overwhelmed by the sheer quantity of information available. It will also depend on their abilities to evaluate the usefulness of selected digital multimodal documents for their learning needs.

A movement has begun all across Canada to make 'personalized learning' the central framework of education in the 21st Century ("Personalized learning in B.C.", n.d.; "Alberta initiative for school improvement: Personalized learning", n.d.; "21st Century education in New Brunswick, Canada", 2010). Discussions about personalized learning focus on the idea of an education system that is designed to "meet the needs and aspirations of individual learners" ("Personalized learning in B.C.", n.d., p. 11). One of the principle discussion points driving personalized learning is the idea that students need to be provided with the skills to engage in a lifetime of learning, rather than job specific skills for the present, in order to be able to continually adapt to the changing nature of the workforce of the future. The rationale here is that the education system is responsible for "[e]nsuring that everyone remains fully functional in ... an increasingly demanding and knowledge-based society [which] will require a constantly rising level of base line skill (Premiers Technology Council, 2010, p. 5). As such, the education plan being put together by the British Columbia provincial government is being described as "increasingly student initiated, self-directed, and interdisciplinary and that is facilitated by the teacher and co-planned with students, parents and teachers" ("Personalized learning in B.C.", n.d., p. 11). One of the possible ways to make education more self-directed (in a system that is becoming progressively underfunded) is to offload some of our students' learning onto computerized learning systems. The relatively rapid pace of the changes that are taking hold of our education system, combined with the increasingly sophisticated

capabilities of modern computerized devices, means that there is a strong possibility that teachers will require additional professional learning, including insights and recommendations as those in this project document, in order to make effective use of digital multimodal documents in the classroom. The next section explains how I selected participants and gathered data to gain such insights that lead to the recommendations further in this project.

Chapter Three - Conducting My Inquiry

Brief Overview

To better understand how selected students develop an understanding of the digital multimodal screen for their learning, I conducted a qualitative inquiry. The focus of my descriptive case study was the online practices of five students from school district 64 (Gulf Islands) when selecting and evaluating Internet-based multimodal texts for their learning in school. After receiving ethical approval for my study from the University of Victoria, and the participating school District 64 (see appendix), I invited students to share with me some of the multimodal texts that they accessed over the Internet on an everyday basis for their learning. These texts variously contained mixtures of printed text, hyperlinks, and video. The data for my inquiry were obtained from semi-structured interviews that were recorded on a digital video recorder and then transcribed by me for the purposes of understanding those students' learning processes. The following section defines why a descriptive case study was the best way to conduct my project inquiry.

Defining Descriptive Case Study

Since, as Merriam (2001) states, "there is little consensus on what constitutes a case study or how one actually goes about doing this type of research" (p. 26), it is useful to briefly describe how I used case study in this research project. Informing my conceptualization of descriptive case study is Chadderton's & Torrance's (2011) contention that case study "is not easily summarized as a single, coherent form of educational or social research," and that it is used as "an 'approach' to research which seeks to engage with and report the complexity of social and educational activity" (p. 53). To this end, the primary objective of my case study was to describe, as thoroughly as possible, the techniques that five students from school district 64 used to select Internet-based texts for their learning and evaluate textual modes in these multimodal documents that contained a mixture of printed text, hyperlinks, and

video. For suchresearch, Hancock and Algozzine (2006) suggest that descriptive case study is the most appropriate approach.

For the present investigation, descriptive case study is especially defined by a number of characteristics and considerations. First, descriptive case study is based on observation, interview data, artifacts gathered from participants, and the researcher's attempts to fully record what he or she hears, sees, thinks, or feels about the phenomenon being observed. Since the researcher actively selects from his or her immediate environment those events, objects, and people that are to constitute the 'collected data' (thus raising questions about the degree to which it is possible to capture all aspects of the phenomenon under investigation), it is incumbent upon the researcher to be as attentive as possible to details in the immediate environment so as to gather as much data as possible.

Secondly, successfully conducting a descriptive case study requires researchers to question "our taken-for-granted understandings [in order to] watch and wait for the meanings in what we see to become clear" (Frankham & MacRae, 2011, p. 34). For me, interrogating my taken-for-granted understandings means that I have reflected on my own understandings of what it means to engage with different text modes (as a formal student) as well as reflecting on my understanding of what it means to interact with multimodal texts. Since I am operating from the belief that my own processes for interacting with multimodal texts are not necessarily unique to me, I am recruiting them to serve as foundation for my research questions. Another facet of interrogating personal assumptions while conducting a descriptive case study includes reflecting on one's assumptions about the kinds of responses that are provided by research participants. This means that individual behaviours and researcher-participant interactions, in conjunction with reviewed literature and the personal experiences of the researcher, determines what is collected as data. As such, case study can be viewed as a research paradigm that allows for unanticipated and emergent events without predetermined or defined

outcomes.

Third, it is possible that some participants may choose to hide certain practices that they normally engage in for fear that they will offend the researcher. This is a concept that Frankham and MacRae (2011) address when they note that as "people re/present themselves to others (and to themselves) ... [their] stories will change according to context" (p. 35). This means that the data that is collected from any one interview with participants is limited to a particular context in so much as it does not necessarily represent a generalizable '*truth*' but rather '*a truth*' that is valid in a particular moment and in a particular place. It is therefore necessary that participants be encouraged to provide authentic responses by minimizing the degree to which the researcher guides responses through leading interview questions.

A fourth consideration of descriptive case study is the restricted access researchers have to the implicit cultural knowledge of a social group that informs individual practice. That is to say, a participant's involvement with a research topic may extend beyond the context and limitations established by the researcher (the boundaries of the 'case' being examined) and include certain practices that develop over time through memberships in a variety of different social groups. As a result, participants may not be consciously aware of how their present practices have been shaped by the conditioning of different experiences over time.

Finally, another feature of descriptive case study is the imperative for the researcher to make sense of what is observed and to draw conclusions from the data collected. Because data are filtered through the perspective of the researcher, the end result can only ever be an approximation of what occurred. While it is the researcher's job to develop a representational picture (as they see it) in their findings, this effort is complicated by the selective nature of observation and the researcher's biases. Thus, the researcher's presentation of the findings is really only "the researcher's constructions of

other's constructions" through which researchers "'play' with versions of the real" (Frankham & MacRae, 2011, p. 35). Put another way, "the world is not an objective thing out there but a function of personal interaction and perception" (Merriam, 1988, p. 17). One way of reducing the influence of a researcher's biases on the findings is attempting to retain as much of the participants' voices (interview data) as possible, including artefacts that they produce in the research results. These voices allow the participants to speak for themselves to the greatest extent possible while simultaneously mitigating the effects of researcher biases (Hancock & Algozzine, 2006, p. 47). Doing this, along with providing an explanation of the researcher's biases, provides for the greatest chance of achieving internal validity within the research findings (the degree to which the research findings correlate with reality) (Merriam, 2001, p. 218). Before I present the students' voices, I will contextualize where and how the inquiry took place.

The Context of My Inquiry and Its Participants

The site I eventually selected for my research came about through my interactions with the then superintendent of School District 64 (Gulf Islands). I had attended a discussion that he had organized at the University of Victoria on the topic of personalized learning and the ways that his district was using Information Computer Technology to facilitate this kind of learning. I was particularly interested in his description of the S.H.I.F.T. classroom (a multigrade learning environment) located at Gulf Islands Senior Secondary School (GISS). Specifically, S.H.I.F.T. was a learning environment where students from a variety of grades congregated and completed course work on a variety of program topics. The course outlines for these topics were located on an Internet server and students often made use of the computers in this classroom for completing their work. I met the superintendent after that discussion to learn more about this classroom and, when I informed him that I was looking for a research site, he invited me to view the S.H.I.F.T. classroom and to consider completing my research at GISS. At the time of this invitation I was

extremely trepidatious about how to locate a research site and resolved to take the superintendent up on his offer. Some months later I made it out to the S.H.I.F.T. classroom and determined that it would be suitable for my inquiry into the ways that students select and evaluate Internet-based multimodal documents for their learning.

Inviting Students to Participate in the Inquiry

Participants in this descriptive case study were selected using purposeful sampling. Merriam (2001) describes purposeful sampling as an approach “based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned" (p. 61). Because my descriptive case study relied on a detailed accounting of students' daily practices, I was interested in especially recruiting those individuals who seemed to have a good deal of experience using Internet-based multimodal documents for their learning and, further, I needed students who could articulate their experiences. It was my intention to select two participants from grade nine, two participants from grade ten, two participants from grade eleven, and two participants from grade twelve (a maximum of eight participants). It was also my intention to have an even mixture of genders (four boys and four girls) if possible. Because I had no prior experience in conducting a study of this type, I chose to select my participants in this fashion in order to minimize the possibility of being accused of not being representational in my study. Upon reflection however, I am glad that I decided to be inclusive in my selection of participants as this allowed for the possibility of having as wide a range of perspectives as possible given my relatively small sample size. Although many students verbally expressed interest in participating in my research, I ended up including only five students who returned signed consent forms during the time I had allotted for this aspect of my research. Because of my intention to conduct individual and group interviews as a way of gaining insight into the techniques that these five students used when interacting with multimodal documents, I anticipated that the quantity of

data I obtained would be sufficient to gain insight into the phenomenon that I was interested in. As to the selection of participants from high school (grades nine through twelve), I believed that due to the relative expense of hand-held Internet capable technology (such as smartphones), high school students were the most likely to have had experience with multimodal documents using hand-held devices because of parental willingness to provide older students with these fragile mobile devices. My assumption in this case seems to have been somewhat correct based on the numbers of students (approximately thirty percent) I witnessed with mobile phones and tablets.

To initiate the process of participant selection, I introduced myself to the blocks C & D S.H.I.F.T. classes and talked briefly about my study as per the script I created to accompany my ethics proposal (see appendix). During my introduction, I emphasized my desire to use my research to support future students' computer use for learning. When my introduction was complete, I invited students to come see me during class time if they were interested in participating in my research. I then walked around the room chatting with a variety of students (for up to five minutes) in an effort to encourage students to consider joining my study and to answer any individual questions they had. Approximately twenty students expressed verbal interest (across blocks C & D). I gave each of these students a consent form (see appendix) to take home to parents containing a description of my study and requesting permission for their son's / daughter's participation. Each student was told that they had a week to return the consent form to their S.H.I.F.T. classroom teacher.

Collecting the Data

Once participant selection was complete, I conducted one-on-one semi-structured interviews with each of the students. With the permission of the school principal, these interviews were conducted in an office adjoining the S.H.I.F.T. classroom and each interview was recorded on a digital video camera. I used a digital video camera because it was a piece of technology that I owned that had superior audio

pickup. This technology also afforded me the opportunity to capture the computer screen so that I could later review those texts that participants had selected during the course of the interview. Prior to turning on the camera, I reminded each student that they were free to withdraw their participation at any time they wished and I checked with them to ensure that they were still interested in participating in my research. No students indicated a desire to withdraw their participation. In order to reduce any uneasiness that participants might have experienced prior to commencing the interview, I indicated that the focus of the interview would concern only their day-to-day activities in the S.H.I.F.T. classroom but that they were free to share with me any other information that they felt would be helpful in understanding their daily classroom experiences using Internet-based multimodal documents for their learning.

It had originally been my intention to record participant interaction with the Internet-based multimodal documents that each student selected to discuss using screen-capture software. I had installed and tested the program I intended to use on my personal laptop, with the idea being that students would use my laptop to access their specific texts on my computer during the interview. I also installed and tested a secondary piece of screen-capture software in the eventuality that I ran into problems with the first. Unfortunately, the first screen-capture program failed to save the interactions from the first interview and the backup program malfunctioned when attempting to save the data from the second interview. I did not make any further attempts to capture participant interaction on my laptop. However, I had positioned the camera recording my interviews up and behind the participant at such an angle so that I managed to capture a view of the laptop screen. In this way I managed to record both all participants' dialogue and their interactions with a variety of Internet-based multimodal documents in context.

Each one-on-one interview lasted for approximately forty-five minutes with two going as long as

an hour. All interviews were conducted within a two-week time period. When the camera was activated, each interview opened with me thanking the participant for agreeing to be a part of my research into their everyday activities in the S.H.I.F.T. classroom. I brought to each interview a print-out of the questions that I used to guide these semi-structured interviews. Each interview started with a request of the participant to describe their course of study in the S.H.I.F.T. classroom and to share with me the main syllabus they used when completing course objectives. Each interview was personalized from that point on based on the specific practices of the participant being interviewed. The guiding interest for these interests was to develop a contextual understanding of participants' existing practices on three common information resource sites in order to establish points of commonality across all interviews. Since I wanted to know how these participants selected Internet-based multimodal documents for their learning, each interview included questions related to the use of search engines (Google), popular video sites (YouTube), and significant information repositories (Wikipedia). Furthermore, because I also wanted to know about how students evaluated the usefulness of an Internet-based multimodal document for their learning, I invited participants to discuss their reasons for choosing/rejecting a page as useful. I also asked participants questions about the processes that they used to explore these pages.

As the interviews progressed, I noticed a number of themes/categories starting to emerge that provided insight into participants' everyday practices. In particular, within in the first three interviews I noticed themes concerning participants' needs to manage the amount of information they were attempting to engage with in a constrained timeframe (the time allotted per block). As much as possible, I steered discussions during the subsequent interviews towards these themes to see if they resonated with participants. I regret that not all of my interviews included the same questions as it was my belief that the information participants were willing to provide would be based on my willingness to directly engage with comments they made. I felt that if I appeared to be explicitly interested in their particular

every day practices in the classroom, which necessarily were going to be different from other students who were working on their own personalized learning programs, that I would be able to get students to elaborate specific elements of their practices with multimodal documents. This meant that not every participant was asked the same questions in the same way.

When all of the one-on-one interviews were completed, I conducted a focus group interview to gain additional insight into the processes that participants used during their one-on-one interviews. This interview was semi-structured and it lasted for forty minutes. The questions in this interview mainly concerned the themes that arose during the one-on-one interviews. This last interview was conducted at the end of the second week of interviews and all participants readily agreed to be part of this final interview. Participants were grouped in a semi-circle in order to capture them all in the same video frame.

My purpose for bringing these participants together for a discussion was to allow for the possibility that deeper insight into individual processes could arise out of the interaction of different ideas offered over the course of the discussion. I framed this discussion in terms of defining the characteristics of a good Internet-based multimodal resource for learning and asked students to offer their advice on how to compose a useful Internet-based multimodal document for learning. Many participants referenced individual practices discussed during one-on-one interviews while allowing that their practices might not be generalizable to the whole group. As much as possible, all participants were encouraged to contribute to the group discussion. However, not all participants were equally comfortable in the group setting and so some of them did not contribute as much to the discussion as others. I did my best to create openings for all participants to contribute to the discussion by making eye contact with those who had not been speaking as much when I was looking for clarification to points that the group had brought up. However, I did not single out any participant directly. The last 5 minutes

of this focus group interview were reserved for answering participant questions about how the case study data would be utilized.

Chapter Four - Presenting the Student Participants' Online Learning Experiences

The sections that follow in this chapter provide a rich description of each of the five different participants' practices relating to the selection and evaluation of Internet-based learning materials. Every effort has been made to use these participants' own words in order to provide an authentic account of their individual practices as discussed during these interviews.

Participant-One (Mary)

Mary was a soft spoken grade twelve female who was the first to approach me to know more about my research. During all days that I was conducting interviews, Mary sat at one of the tables in the S.H.I.F.T. classroom and I never actually observed her using the available classroom computers. She usually had her backpack with her beside the table and worked out of a textbook on the table. This participant did not seem to readily engage with the rest of her peers during class time. This was especially notable as many of the other students in the S.H.I.F.T. classroom that also sat at tables or on the couches tended to cluster in groups.

Contextual notes. This was my very first one-on-one interview that I had ever conducted. I knew that I needed to stretch these interviews for approximately forty-five minutes (under a recommendation from my supervisor) but I was nervous that I would run out of things to say. As such, I chose not to jump immediately into the list of questions that I had prepared. I also knew that I should get to know the participant a certain amount in order to be able to describe her in this project. I started this interview by asking this participant a little bit about why she was in S.H.I.F.T. (a tactic I used thereafter for the other interviews) and then asked her to describe some of her every day practices.

I wish to mention at this juncture that I did not have any experience / practice with conducting

case study or conducting one-on-one interviews prior to this interview. I attempted to understand the process of conducting interviews using academic treatments on the subject but found that my lack of experience prevented me from taking a consistent and rigorous approach to this aspect of my research. These notes are meant to help me (and my readers) track the evolution of my research approach in the hopes that my results might retain some degree of validity.

The interview. I began by asking Mary what she was studying in S.H.I.F.T. during this block.

Q: "What was the subject that was scheduled for B block today?"

A: "Well, I am in S.H.I.F.T. every block of the day. I was going to do English this block and write poems because that's what I do. Usually when I do poetry I just have a thesaurus and dictionary open."

At this point I decided that I should ask for as much information as possible about how Mary selected any website (or piece of software) she chose to talk about for her learning. So rather than try to immediately move the interview into a discussion about Wikipedia and YouTube, I asked Mary to take me to the dictionary and thesaurus she used. She immediately went to http://dictionary.com. This was a site she was clearly familiar with. This same site also included the thesaurus she used.

Q: "So, how do you use this?"

A: "... I have a tendency to use the same words over again... so I'll just type in, um, the word to get a different word for it or if I don't know the exact definition of the word in case I'm using it in the wrong context."

I asked Mary to "take me on a typical search" by looking up a word that she remembered searching for in the past and she input the word 'broken' into the search field. As she was reading through the definition that came up I noticed that the Dictionary.com website had quite a bit of information on the edges of the screen, with the main definition being displayed in the center. When I

asked her if she evaluated the usefulness of information also at the edges of the screen, she replied "unless I don't find what I want then I look around hoping that there is something different... usually I just look at this and nothing else." To help explain why she had a tendency to focus on the center of the screen, she added that "... everything outside of the middle of the page is just going to be ads so I just never focus on it." The idea that relevant information is typically located in the center of the document was echoed by other participants.

The interview then moved to a discussion about some of the research she was required to complete for her Family Studies class. Google's search engine turned out to be an important tool for Mary to quickly locate information she was looking for. Mary decided to show me how she would look up a definition of adolescence. Rather than use Dictionary.com, she typed "definition of adolescence" into Google. To explain the approach she was using, she said "If I don't use dictionary.com, I usually just type in a word and then 'define' so that I can get the definition really quickly because it's really easy because it's just there." When the results list was displayed, Mary selected the link at the top of the list. When I asked her if she just picked that link "because it was first on the list," she responded "Um hum ... it looks like it would probably be what I was looking for." After looking through the contents of the document pointed to by the first link, Mary declared that she "wouldn't use any of these... because I don't like how they're worded." She could not immediately provide any insight as to why she didn't like the way they were worded.

When I attempted to guide our discussion to focus on Wikipedia, Mary replied: "I would never use Wiki." When asked to explain why this was the case, she responded: "Because my teachers have drilled that into my brain that it's never a reliable source." Mary did not sound like she really felt that Wikipedia was an unreliable source but that it was inappropriate to acknowledge information on Wikipedia as a source for her assignments. She added that her teachers used the "logic ... that anyone

can go in and change it.” She later clarified that she had interpreted her teacher's dislike of Wikipedia as merely an injunction against using information from Wikipedia "for school stuff".

For this participant, it was not the case that Wikipedia could not provide useful information. Rather, it was clear to me that Participant -One was merely attempting to quickly locate information that fit into the expectations of her teacher and the assignment she had been required to complete. For her purposes, she could often “find better information on a lot of other places.” It had not occurred to me during this interview to inquire into how this participant’s time management strategies affected the techniques she used for finding information. I was to discover in later interviews that many students felt that they did not have sufficient time to complete their assignments and so they looked for Internet-based learning resources that would succinctly provide just the information they were looking for to satisfy the requirements of an assignment. I noted that issues of time, competition, and types of assignments were starting to emerge.

Despite Wikipedia being officially off-limits, Mary indicated that she sourced information for her school projects from a wide variety of websites.

Q: "So there are a lot of resources? Wikipedia doesn't need to be your only source?"

A: "Usually it's my last option."

I was intrigued by this response because it implied that Mary did in fact use Wikipedia as a source of information for her learning, but only when she felt forced into using it. Fortunately, she provided a hint as to why she would feel pressured into using Wikipedia as a last resort. When discussing her Family Studies class, Mary stated, "as long as I source where I got the information from, I can just copy and paste it into my PowerPoint." To explain why she felt this was a necessary practice for her, she declared "It's so hard putting things into your own words when you, like, they already wrote it perfectly on this website. I can't put that any better so I just have to copy it." Although Mary had noted that she

was required to cite where she had obtained her information, she did not evince an awareness that this information had originated with a specific individual and that a citation ensured that this individual was credited with his or her original thoughts. As a consequence, plagiarism was not a problematic concept because she was merely copying information that was freely available on the Internet.

It was at this point in the interview that I first started to suspect that Mary was purposefully limiting the quantity of information that she was interacting with. This was a central theme that developed throughout the remaining interviews. It seemed to me that this participant was reducing the amount of information that she could interact with by limiting her focus exclusively to the printed text that she needed to complete her assignments. When the interview turned to questions of how Mary evaluated whether an Internet-based document was useful for her learning, she referenced her need to locate just the text that could be used in her assignment. When asked if she would read through an entire page of printed text to ascertain whether it contained information of interest to her, she replied, "Um, I would probably just scan through this and see if any of it had to do with what I was looking for." I was curious what she meant by "scan over" and so she clarified by saying that she would just "look for key words". She seemed to use the same approach when deciding whether to follow a hyperlink in a document. She noted that she only clicked on a hyperlink if she wondered “what it is or if it has something to do with what [she’s] looking up.”

I was also curious if the way text in an Internet-based document was formatted (colour and spacing) affected her perception of a document’s usefulness. When we came across a document that had a blue theme, Mary declared that it “was confusing to look at because it was all different shades of blue.”

Q: “And so is it the colour that makes it hard to see the text or is it a combination of spacing and text colour and, um, the size of the font?”

A: “Um, yeah. There’s a lot of text and small font and it’s all blue and it makes it hard to look at. ... I would probably just scan over this and close it and then go to the next one.”

Q: “To make this page better, what could have been done?”

A: “Make the text black and white instead of blue and make the font at least a little bit bigger and spaced out a little bit more.”

I next tried to steer the interview to a discussion about YouTube. After asking Mary to navigate to the main YouTube website, she replied that she did not “remember ever using a video to get information for any kind of projects.” My main reason for asking her about YouTube was to create some discussion about how she used video for her learning. So, I changed my tactic and asked her how she would explore a page that had a combination of video and text.

Q: "Hypothetically, how would you go about looking at that or dealing with that page?"

A: "I'd read the text and then if the video seemed like it would be helpful I would watch it, but I don't usually watch the videos... it's just that I can usually get information from text, plus it’s easier to copy the information and it's just easier.

By the time I had reached the end of this interview, I had a sense of the purposeful way that Mary selected an Internet-based resource for her classroom learning needs as it related to the specific needs of completing her assignments.

Participant-Two (Peter)

Peter was a grade nine male student who was a member of a group of students who regularly met at lunch time in the S.H.I.F.T. classroom. This group of students would primarily discuss a variety issues related to computer programming and video games. Not all students in this group were working with the same computer programming languages but each would share information on how to solve problems using programming. I was able to sit in on a number of these discussions during the

recruitment portion of my research (I was present to help remind students to return their consent forms) and I was even able to contribute on a few occasions. These discussions often concerned the computer programming languages C++ and Python. Peter made regular reference to a programming environment called GameMaker. Since I have a working familiarity with C++, I contributed to these discussions on two occasions as a way of showing my interest in how they were using computers for their learning. It was during the first of my contributions to these meetings that Peter expressed interest in being part of my research.

Contextual notes. I was more comfortable with conducting one-on-one interviews by the time I began this interview. I realized that I didn't need to be as concerned about running out of things to talk about and so I was much more relaxed. This enabled me to build on the theme of 'managing information overload' that had started to take shape in my mind with interview one. As I have mentioned previously, I entered into this research project without the benefit of any experience in conducting interviews. As a result, my approach to interviewing varied from participant to participant. Because I had allowed myself to ask additional questions during the interview that I felt would lead to a deeper understanding of the main interview questions, I did not ask all participants the same questions in the same way. In the case of this interview, I was curious as to whether this participant also purposefully limited the amount of information he interacted with (similar to Mary) in order to complete his school assignments. I also was particularly interested in how this participant's experiences with text colour compared with those of Mary.

I feel that it is necessary to describe at this point the way that my research approach became an iterative process. As each interview progressed, I continually attempted to correlate the ideas that I heard expressed by the current participant with the ideas that I had heard expressed by prior participants. Now that I have had the opportunity to reflect on why I chose to structure my interviews in

the way I did, I realize that I did this because I was uncertain about how I was to structure the results section in this project (having never before undertaken a project such as this), save for the fact that this section of the project was to touch on the themes I noticed within the data. To this end, in the event that a participant expressed similar ideas / approaches to selecting and evaluating Internet-based multimodal documents as another participant, I made an effort to ask the current participant additional questions about this concept in order to learn as much as possible. As a consequence, I only made casual reference to my list of guiding questions because I believed that I had learned from the first interview that many of the ideas that I wanted to discuss did not need to necessarily focus on how the participant used YouTube and Wikipedia. Rather, my approach was to be sure to touch on the relevant concepts embodied by the research questions as they applied to whatever Internet-based texts that the participant selected during the course of the interview.

The interview. I began by asking Peter to share with me some details about what he was studying in S.H.I.F.T. during this block.

A: “Well, usually, um, throughout my entire semester, um, I’ve actually just been really working on GameMaker. Um, I think I’ve worked on three, uh, games. ... it asks you to do a final assignment on the website. ...and I was going to finish that off today.”

Q: “Ok, and what course is the GameMaker program part of?”

A: “I guess it’s just called GameMaker. It’s on IC. It’s called ‘ICT9’ I guess. ... like an info-tech IT course here.”

Once we had covered the contextual details, I moved the interview into a discussion about the ways that this participant selected Internet-based documents for his learning. I particularly wanted to get a sense of how he searched out information in order to complete his assignments.

Q: "So, what do you do if you're at a point where you really need to get at a piece of information

and the teacher's not there? Do you ever go onto Google... and put in a search query for the term you are looking for?"

A: "Well, sometimes, um, I have in the past gone on YouTube and, like, if I wanted to know how to do a specific thing. For GameMaker sometimes I'll look it up.

My prompt to discuss Google was an attempt to begin a discussion about the mechanics of performing a search and selecting a result. I had noted from the previous interview that Mary had a tendency to select the first document link from the list of search results and I was curious if this participant's approach would be different. Although Peter chose to redirect our conversation to focus on YouTube, he chose to perform a Google search for YouTube rather than directly navigate to the YouTube website. I asked him to share with me his process for performing a search.

Q: "How do you decide what to do here?"

A: "Generally when you search for things like YouTube or Facebook or, you know, all these big things that you're looking for um, you - they tend to be at the very top."

I wanted to know why he was so quick to pick the first result without looking through the whole list of results but he could only offer the explanation that he had "done it a thousand times." This answer suggested that prior experience with performing searches had resulted in both Mary and Peter being generally satisfied with the top search result being returned by Google. As a consequence, it seemed both of them were generally unconcerned by the remainder of the list of search results.

The role of prior experience in selecting an Internet-based document was also evident in how Peter chose the parameters for searching on YouTube. Once the YouTube site was loaded, I asked this participant to think of a search that he might have performed when looking for information on GameMaker. He started by typing the word 'gamemaker' into the search bar.

Q: "So, why do you put 'gamemaker' first?

A: "Just to give it more of a narrowed down search."

When he was satisfied with the formulation of his search parameters, he pressed the enter key to submit the search query to YouTube. Rather than instantly clicking on the first link, Peter noted that the search parameters had been analyzed and interpreted by YouTube. The list of results had a note at the top suggesting an alternate search query. Interestingly, rather than just accepting the new search parameters (by clicking on YouTube's suggested search query), Peter placed the mouse cursor over the suggestion and paused.

Q: "So, were you about to click on this without even looking at this?"

A: "Well, sometimes it doesn't make much of a difference. I mean, I think the only difference was just a space."

Both in how this participant crafted his search parameters and how he responded to the Google's prompt for reformulating the search suggests that Peter had learned from his previous experiences in crafting search parameters. That is to say, Peter seemed to be working with a degree of automaticity with crafting search parameters that came about through his previous experiences with the Google search technology. Locating only the desired information means including keywords that circumscribe the possible results that could be returned by the search. In this case, finding information specific to the GameMaker environment necessitated including 'gamemaker' in the parameter list.

Next, I wanted to explore any possible connection to Mary's focus on text. I had asked this participant if text was useful to him when included in a video, and he replied that it was "not as easy to read something and try to watch the video at the same time." Since it had been his suggestion to find information about GameMaker on YouTube, I wondered if he had a visual learning preference and whether he went out of his way to avoid resources with a significant amount of printed-text when learning something new. This would be an indication that text mode was an important consideration

when selecting a multimodal document. I probed this by asking him what he would do with a page that provided a "step by step detailed textual description" rather than a "visual representation of all the things you were supposed to do. He responded that he was "a very visual person" and that "a video would probably be a lot more useful for [him] even if it didn't have sound or anything like that because it would actually be visually showing you what [he] had to do." It seemed to me that Peter was likely a learner who best understood information when it was supported by graphical images (pictures). Of course, I reminded myself that his preference for video in this instance might be more closely related to his learning needs in ICT9.

I had hoped that Peter could shed some light on why he preferred visual documents and so I asked him to describe why he would search for information on YouTube. His explanation concerned how he learns a new process:

"What I might do is sometimes, if I was following, um, a tutorial like this and it gets to a point where I can't remember everything that he's doing, ... the possibility is that I can have the video and drag it over to this side of the screen and have it take up this side of the screen. And then I can have my GameMaker here and as he's doing the video and he does something, I pause the video and do that thing that he just did."

It occurred to me to ask him whether he felt he was a strong reader and he replied that he was "a pretty strong reader" and that he did not "have much difficulty understanding what [he] was reading." However, I wondered if there was anything that could be done that would make printed text more attractive as an information resource. We used the Internet-based document containing his course description as a reference point.

Q: "Describe for me your feelings about this page or, um, just describe for me how useful you find this page."

A: "If it was colour organized, ... it would be easier to navigate but now that it's bland I find myself having to really read the actual text to find out what I'm looking for. Whereas if there was colour navigation, all I have to do is remember colour."

Peter later indicated that because the course outline detailed "instructions telling [him] exactly what [he] needed to do," then he "read it very thorough." This suggested to me that he didn't have a specific aversion to text, but that he had to work harder to make sense of it. It came down to the fact that Peter seemed to find it difficult to quickly locate the main ideas in printed text.

Participant-Three (Ellen)

Ellen was a grade twelve female student that I had met six months before when I had accompanied a group of teachers-in-training out to GISS so that I could survey the school as a potential research site. The purpose of the visit for the teacher education students was to get a sense of how GISS had integrated Personalized Learning into everyday school activities and these local students had been invited to provide a first-hand account of their experiences. Ellen was the most articulate and outspoken of these students.

During the period I was conducting my interviews, I observed this participant working on her personal computer at one of the central tables. She regularly sat with the same group of people and was very social. I was pleased to see that she was present during the S.H.I.F.T. blocks in which I had chosen to recruit for my research as I had noted that she both owned her own computer and that she was an articulate individual. She agreed to become a participant in my research after I approached her to discover if she was interested. This participant was registered in S.H.I.F.T. for three of her blocks.

Contextual notes. I was beginning to get a better sense of how to conduct myself as an interviewer in one-on-one interviews by the time I began this third interview. I was well acquainted with my discussion questions at this point and I had decided not to disjointedly force the participant into a

discussion on YouTube and Wikipedia because there would be ample opportunity to naturally steer the interview onto these topics during the course of our discussion. Going into this interview, I had been reflecting on the ways that participants seemed to proactively circumscribe the quantity and types of information that they engaged with when looking for Internet-based multimodal documents for their learning. This was the interview that crystallized this concept in my mind as 'managing information overload'.

The interview. I began by asking Ellen a little about the personal computer that she brought to the interview. She was the first participant to bring her own computer to the interview and she requested that she be able to use this platform. I reasoned that her experiences with selecting and evaluating multimodal documents may be dependent on the platform she was using and so I decided to ask her a little bit about her computer. She established that she used a Mac computer because she did not “do well with a PC”. I was curious about how much of her school work was completed on this computer.

Q: “What percentage of your work is done on the computer do you think?”

A: “75% maybe? ... I would say so because math and physics - even though I spend a great deal of time doing writing - like, for practice problems I also use technology and videos and online resources in all those classes as well. So yeah, I would say 75%.”

By this time I had established that this participant regularly used her computer for selecting multimodal documents for her learning and so I was interested in understanding the process she used for selecting Internet-based documents for her learning. Similar to Mary’s reluctance to use Wikipedia, this participant indicated that she heavily preferred documents that were sourced from Internet-based resource websites that were approved of by her teachers. The first of these websites that we spent some time discussing was Khan Academy.

Q: "How did you come to Khan Academy? What alerted you to the fact it was a useful resource?

A: “I was just talking to one of the Bio teachers, um, and he showed me a few websites that were handy.”

Ellen was interested in finding Internet-based resource sites that she could use to supplement her classroom learning. In particular, this participant was interested in finding further instruction on many of the concepts that were either covered in her traditional face-to-face classroom contexts or were related to her S.H.I.F.T.-based courses. Ellen repeated the idea throughout the interview that the resource sites she was selecting directly related to the classroom material being used by her teachers. This does not mean that she was using resources chosen by her teachers, only that she was ensuring as close a match between the resources she used for her own learning and the resources that her teachers were using to support in-classroom discussions. Concerning a website that she was using for Chemistry, she noted that "... [her] teacher from [her] class was using a lot of questions from this site... [and so she] knew if [she] was practicing on this site [she] would be doing better for his class because he's marking it". For sites such as Khan Academy, she described these as valuable resources because their information was organized similarly to the way that the classroom material was organized.

A: “Our teacher will tell us, ‘Oh, this site is going to be similar to what we’re doing in class in terms of how they organize their units’.”

Q: "So the usefulness of the site... has to do with how closely and easily recognizable it relates to what it is that you are working on in class."

A: "Well, in a sense. It depends on who I think the student is. I mean, because I'm pretty good with resources in the sense that if I find something helpful I can usually apply it to what we are doing in class. But for a lot of people, if it doesn't relate exactly to what we're doing — what the unit is called, or what the chapter is called — they're not going to see the connection."

One of the most striking aspects of how Ellen selected digital multimodal documents was her overriding sense of impatience to quickly find the information that she was looking for. The Internet-documents she found the most useful for her learning were the documents that minimally interrupted her focus on completing an assignment.

A: “You want to make it easy on yourself. You’re looking for a good website that’s going to be helpful and not take a lot of time.”

This is a behaviour that resonated with Mary's singular interest in finding just the text necessary to complete an assignment in that both of these participants evinced a lack of desire to engage with any information that did not contribute directly to their focus on doing school work. I decided to ask her to share any insight she might have had about her general impatience.

A: “So why am I impatient? Um, I think that’s mostly part of my character. I just don’t like lines. I don’t like waiting.... I think it’s just about being efficient and about being smart."

Q: "So, it sounds like... you go into your learning experience with... the objective of performing well on the specific tasks that your teachers have given you to do."

A: “I think that ... the biggest problem about education today is that it is performance orientated. Because if I wasn’t concerned about that... I would probably have more patience and I’d probably ... be more willing to explore but because I’m searching for a specific answer to a specific assignment for a specific teacher who’s going to give me a very specific grade, then... that changes the way that I’m going to approach... the learning.”

Ellen's general impatience to complete the assignments she was working on seemed to contribute to her mode of choice when selecting an Internet-based document for her learning. When she brought up LearnNowBC (http://www.learnnowbc.ca) during the interview, it was to note that she "mostly used the videos... for Chemistry and... for Physics." During our discussion of how she evaluated

the usefulness of the videos on Khan Academy, Ellen noted of the instructional approach used by the site's principal instructor: "He's not doing, um, he's teaching the lesson and it's like being in the classroom. Right? He's using that as his board." She also noted that a site's usefulness for learning depended on "having a good teacher-student relationship with the person who's teaching it." From these statements I concluded that, like Peter's preference for video, Ellen was selecting resources that reduced the amount of translation required between the instruction and the task.

However, this participant's driving impatience to quickly engage with the information she was looking for also pertained to video. Despite having chosen Khan Academy as one of the resource sites she wanted to talk about during the interview, she declared that she didn't "particularly like his videos." As a way of explaining why she still felt that the videos were useful for her learning, she noted that:

> A: "Sometimes I can sift through and find the information I'm looking for. Like, if it's a formula or an example and I can still make it useful but I wouldn't particularly want to sit and watch fifteen minutes of him teaching a lesson. ... He's just kind of slow I think is what it is."

I became very curious about how this participant felt about the usefulness of text for her learning. I detected that she had a preference for video but I had also detected an impatience with the amount of time it sometimes took to get at the information she wanted. I reasoned that she might have found some utility in having a transcript of the video immediately visible on the same screen as the video she was watching and so I decided to ask her about a hypothetical scenario.

> Q: "Let's pretend that you could have... a Khan Academy video on one side of the screen and your text on the other side of the screen."
>
> A: "I wouldn't read the text."

When Ellen brought up a website called The Physics Classroom for discussion, I observed that this site had an incredible amount of printed text on it. She was quick to point out that she mainly used

this site for its practice problems and described why she did not use if for the information it contained.

A: “I don’t like this site as much because it’s got a lot of words. Like, if you go to a lesson, um, it’s got ... paragraphs right? So I find that really confusing. But, well, not confusing. It’s just time consuming and not efficient.”

I was fascinated that this participant was pursuing studies of Biology, Chemistry, and Physics but avoided printed text as often as possible when she was selecting Internet-based multimodal documents for her learning. I noticed that she had brought a textbook for one of her classes with her to the interview and I was curious about how she perceived its lengthy textual descriptions.

Q: “And when it comes to that big block of Physics text?"

A: “Like, I like it when it’s more clear and, like, small sentences and I find it hard to do Math and Physics when it’s in a big block of text.... Here’s something where colour would be really helpful, right? Because it’s all super condensed, it’s all really small. Like, I look at this and my eyes just glaze over. ... So, textbooks that have colour I find are really helpful because it helps you discern where the information is and what’s going to be useful.”

Ellen's insistence on finding instructional videos for her learning, coupled with her description of how printed text made her "eyes just glaze over" all pointed to her ongoing attempt to limit the amount of information that she had to contend with as she pursued her learning.

Participant-Four (Stewart)

Stewart was a grade twelve male student that also participated in the lunch time conversations involving Peter. Unlike Peter’s interest in GameMaker, this participant’s contributions to discussions about computer programming involved the C++ programming language. Since this is a language I have significant experience with myself, I was able to more capably engage this student in some of these conversations. I did this by sharing my own experiences with solving an array (a list construct) sorting

technique in C++. It was hope that by discussing concepts that Stewart was interested in, that he would feel comfortable with the idea of sharing his S.H.I.F.T. experiences.

Contextual notes. By the time I started this interview, I was much more comfortable with the process of interviewing. Having formulated the idea that the students interviewed so far were actively managing feelings of information overload, I wanted to determine the extent that this idea was or was not shared by Stewart and to arrive at a better understanding of how the classroom context contributed to engagements with Internet-based multimodal documents. Additionally, I wanted to probe with this participant the importance of social interaction in the task of learning new programming procedures. This question arose partly because of Ellen's comments about feeling a relationship with the narrator on the Khan Academy videos.

The interview. I began by asking Stewart what he was studying in S.H.I.F.T. during this block.

A: "It's not really S.H.I.F.T. for me. It's more just... I look at the assignments given on the Internet... by the school."

Q: "Everyone who's doing the tech course here uses the same page?"

A: "C++. This is the page to go to."

Although I did not ask all participants about the importance of social interaction when learning a new programming language, I reasoned that if I were in a classroom situation with other individuals working on the same programming assignments that I would look to the others in the group for their approaches to the programming tasks.

Q: "Ok, so is everybody in your program doing the same thing?"

A: "There's only a few of us doing the programming, but we're all on this page."

Q: "Are you all working at the same pace ... or are you working independently?"

A: "We can work independently but we work together. Might as well."

Q: "Does it make it easier when you work together?"

A: "Well, if one of our programs messes up, the other person can help fix it."

Stewart's response in this case suggested that social interaction in the classroom context was important to how he engaged with the Internet-based texts needed for his assignment and so I directed our conversation to a point in the past where he came up against a programming problem that required him to use "YouTube when [he was] trying to learn something new."

Q: "So, why did you choose to look up arrays on YouTube rather than go to http://www.cplusplus.com or another site like this?"

A: "Because, ... I was a bit confused by these pages at first for arrays so I decided to see a more interactive way to look at it."

Q: "What was it about the YouTube video that you found useful?"

A: "Well, it was another person explaining it in their own words. Like, how to, uh, how to use them and showing it. Like, directly how it works and all that. ... [I was] able to see what they were talking about at the time they were doing it."

I asked this participant to take me to the video on YouTube that he had used to learn about arrays (a programming construct used to order a list of objects in computer memory) and he located a video where the presenter showed only the printed-text editor of the programming environment. At no point did the presenter appear on camera but rather, the presenter commented verbally on the sequential steps required to construct an array object in C++. What was most striking about this commentary is that it included the presenters' own metacognition about the role of each line in the computer code as he wrote it out in sequence. What struck me as most interesting about this response is that it carried a similar sentiment as Ellen's commentary on the usefulness of the Khan Academy videos. That is, both of these participants found value in the connection that they felt to the

commentator in the videos - a significant finding.

I next wanted to inquire into this participant's use of comment sections on YouTube and how this factored into his evaluation of the potential usefulness of a video.

Q: "Do you find ... comment sections on pages or forums in general useful to you when you are learning?"

A: "Very useful, yes. The comments, for example, on YouTube videos — I usually look at those first. So, if a video's really good there'll be a lot of comments saying so and if it's really bad, of course, there's not going to be very good comments in there."

Q: "Let's pretend that people have things to say about it that don't seem like the video's good".

A: "Um, it depends on how many people are saying it. If there is only one person out of ten saying that it's not too good, then it's not a problem."

Since I was thinking about how Stewart was evaluating this video as a useful resource, I decided to push a little deeper and see if he could explain his reasoning for choosing this video over others in the list of results provided by YouTube.

Q: "I noticed that as you do searches you have a tendency to just hit the one at the top of the list."

A: "I looked at the views mostly. ... Generally the first few ones are the most likely that I'll be [selecting] and if it doesn't [have high enough views] I'll just go to another one."

A: "Also, the person that posted this video is posting a lot of comments as well - answering questions. So that's always a good thing. ... And even if I don't get something I really want to know, I can just ask in the comments."

Stewart's method of selecting a resource demonstrated a tendency to prefer texts that clearly demonstrated a community of users (number of views) and a tendency to value the usefulness of a page

according to the engagement of that community (comment activity). I decided at this point in our conversation that it would be useful to see how this participant's experiences with video differed from his experiences with printed text on the same topic (arrays). I asked him if he had also tried to source information on arrays from http://www.cplusplus.com and he confirmed that this was a site that had "a ton of information about everything about C++" and that he "could look up pretty much anything about C++ from this website." However, because he indicated that he had used YouTube as his main resource for learning about arrays, I wanted to know what it was about the printed-text treatment of this topic that he had difficulty with. My reason for directing our conversation in this way was to determine if he found some textual modes more useful to his learning than others as this would be a significant factor in how he selected multimodal documents for his learning.

Q: "So, let's go to the search that you did for arrays on your C++ site."

A: "So, I go to arrays and I was reading pretty much all of it. As I got further down it got a bit complicated with all the diagrams and things. I don't really know why but I just didn't really..."

Q: "What could have been done to this page that would have made it easier for you to understand?"

A: "I'm not sure. It's pretty clear now that I go back to it — now that I know what it's talking about."

Besides learning that Stewart simply abandoned this page because he was having trouble following the evolution of the ideas within the text, I did not really learn why a printed-text treatment of arrays was less useful to his learning than a video. I reasoned that I might arrive at an answer to this line of questioning by asking him to describe his process for parsing a page full of printed text.

Q: "How do you explore a page like this? Do you look at this and explore the page or do you read it from top to bottom or do you scan through it?"

A: "Well, if I really want to learn everything about something I'll just go through from top to bottom and then look at everything but..."

Q: "How much of this text would you read?"

A: "Well, as much as I could without getting too confused. And if I do get confused, I would just try to read it again...."

I suspected that part of the difficulty this participant may have been experiencing with the text might have to do with his learning preferences (which he described as being "more doing" than reading) and the time pressures he was experiencing at the time he was grappling with arrays for the first time. This suspicion was based on Ellen's insistence that video was a more useful tool to her learning when she felt constrained by time pressures and this accorded with my notion that these participants' practices for engaging with Internet-based texts were governed by a need to manage feelings of information overload.

Q: "What motivates you to get to the end of the assignment?"

A: "Well, there are due dates for them. So, I have a limited amount of time to do them. It's always nice to be able to do them in a short amount of time as possible to see how good I am at this."

Q: "And typically, how much before the due date do you get your projects done by?"

A: "Well, last time it wasn't done by - it was a bit late. I hadn't really focused too much on it."

So, although this participant did not directly acknowledge that his practices for engaging with Internet-based multimodal documents were developed in response to the time pressures he experienced in a classroom context (similar to Ellen), it seems likely that time pressures on completing his assignment compromised this participant's ability to make his way through a textual description of a learning objective. I next wanted this participant to describe how his sense of purpose-orientation within

the time constraints of the classroom factored into his approach to learning.

Q: "How important is your sense of purpose or why you're coming to a site? How important is that in your determining what's important on a page?"

A: "Well, if I'm looking for something and it shows you something else, I'm not really going to look at it, ... [and] if I can't really understand it then there's not much point reading it. ... But if I can understand everything that's being said then it's not really a big problem."

Stewart's response to my question indicated to me that his evaluation of the usefulness of a page for his learning started with an assessment of whether the information contained on the page matched his expectations for what should be there. Although my question to Stewart did not explicitly ask him whether he scanned the page looking for a specific piece of information when was learning something, his response does seem to indicate that he is open to exploring the information on a page he is viewing.

Participant-Five (Gordon)

Gordon was a grade ten male student. I was particularly interested in this student when I discovered that he spent as much of his time as possible working on music production. He was the first of my participants to return a consent form but then he did not return back to school due to sickness until the last few days of my scheduled interviews.

Contextual notes. I really wanted to focus in this interview on the decision making process that this participant used when selecting and evaluating the usefulness of an Internet-based multimodal document for his learning. In addition, I wanted to make sure that I asked this participant to more fully describe himself because I did not feel that I had gone far enough with getting to know Stewart. This was important to me because I wanted to really develop these participants' voices into distinct contributions when I wrote up this project.

The interview. I began by asking Gordon what he was studying in S.H.I.F.T. during this block.

Q: "What do you normally do during your S.H.I.F.T. block?"

A: "I'm taking P.E. ten. That's actually all. Well, I'm doing English as well, but I have both of those classes for this one block. ... What I'm doing is really flexible. Mrs. L. pretty much said if you have any ideas for assignments that you kind of want to do, we'd talk about it and then, uh, switch one of these out for one, uh, that I thought of. And since I'm a musician, I do things like write four different songs in different poetic styles."

Q: "How did you come to do it through S.H.I.F.T.? Was it a decision you made?"

A: "Uh, I was in a, um, music program that offered English in it but it wasn't a great English class. So, I decided to go with this instead because it's more flexible."

I was intrigued by the idea that he had previously been in a music program that offered English and that he had been unsatisfied by it. To my mind, an English class involves a great deal of printed text and I wondered if he had a preference for modes other than printed text as this would be a significant factor in how he selected Internet-based texts for his learning.

Q: "Now, what kind of learner are you? Are you somebody who likes to watch videos? Are you somebody who learns best by talking to somebody? Are you somebody who learns best by reading? Or, are you somebody who learns best when they do something?"

A: "Uh, I do something or watch how it's done. ... I have trouble just reading something and then doing it."

I decided at this point in the interview not to jump to a discussion about the effect of time pressures on the reading process but to instead see if he could provide additional insights into why he experienced difficulty with printed-text.

Q: "What is it about a block of text like this that gives you trouble? Or does it? I mean, you

seem to be suggesting that a big block of text like this just wasn't where you were at. Why is that?"

A: "It's just something like there's nothing to look at. There's nothing that, like, excites me so when I'm reading it I read it all but it just kind of goes right past. Like, I don't actually take it in."

I was glad that I had chosen to let Gordon offer this explanation because it correlated nicely with a similar explanation provided by Peter. In both of these interviews, the participants suggested that they experienced difficulty with printed-text because it was sufficiently unstimulating as to cause them to lose interest in what they were reading. However, it occurred to me that this participant's explanation might be only part of the story. I had also learned from Peter that having a block of text broken up into smaller pieces made the reading process easier and so I pressed Gordon for more information.

Q: "Let's pretend [your teacher] took this document and broke it up into three smaller documents. Would that be easier or harder for you to read?"

A: "Uh, I think it would be easier. ... If you're reading a whole thing, you'll forget stuff at the beginning. I don't know. It's just easier if it's a short segment."

I was also interested in comparing this participant's experiences with those of Ellen's, who also had an aversion to long blocks of text. In particular, because Gordon had already stated a preference for watching how something is done, I reasoned that this participant may more regularly choose video as a learning resource.

Q: "Let's pretend that, um, this page had a big block of text down here, and a video up here. What's your first inclination?"

A: "That would be perfect! That's actually the next addition to this that I think should be here."

Q: "Ok, so you think a video would be a definite addition to this page."

A: "Yeah. Well, it's like in classes. They'll talk about it and then they'll give you, like, a page. And that's kind of what this would be if you watch a video and then read about it. I think it's easier to do things that way.

I was intrigued by the way Gordon compared watching a video on the computer screen to watching a teacher giving a lesson in the classroom so I made a mental note to discuss this concept in more detail later on in the interview. However, I wanted to get this participant to delve deeper into the processes he used when selecting a video for his learning. Our interview touched on the fact that he would sometimes go to YouTube when he was learning to play a new guitar piece and so I asked him if he could recall any "guitar tutorials that [he could] remember or any other websites." He settled on taking me to YouTube for a video that he had recently viewed. I asked him to explain his process for finding a useful tutorial.

Q: "How do you decide what video you're going to watch?"

A: "Well, the thing is, [a video] that has like a million views ... means that it's a better tutorial. I wouldn't pick something with only one hundred views. ... If it's good, most likely people will go to it again or they'll go to [the author's] channel. I don't know — a million views is a lot. ... I'll just [select] whatever the top suggested one is."

Q: "Have you tried searching beyond the top suggestion?"

A: "I don't always take the top. No, I'll take the top if it kind of fills in what I want."

Gordon's description of how he selected videos from the YouTube results list was similar to the responses provided by Stewart. Similar to other participants' discussions about how they used YouTube, I noted how user commentary factored into how this participant evaluated the usefulness of a video as a learning resource. I had especially started to see with Stewart how a sense of community was an important consideration when selecting a resource and I wanted to further develop this theme.

However, I was surprised by this participant's valuing of comments left by other visitors.

Q: "Ok, and what about the comments. Do you ever look at the comment section?"

A: "I actually always look at the 'top' comments. I don't know why. Not because I'm interested to see what people say."

Q: "So, do you ever find yourself taking suggestions from the comments?"

A: "No, I purely look at the 'top' comments just to see if they're funny or not."

Although this participant didn't claim to see any usefulness in comments left by other viewers, he still nonetheless leveraged the opinion of the social group when deciding on the usefulness of a video. Rather than looking at comments, this participant relied on the 'thumbs up' and 'thumbs down' user rating system that is a feature of the YouTube comment software.

A: "And then you can also look at the down votes. There's ten thumbs up and three thumbs down. But that's not really that much but usually, if the green is right in the middle, I'll automatically not watch the video because there's been a number of bad reviews. Usually, if it's not a great video then people don't — unless it's really bad —give it a thumbs down.

At this point I was able to connect Ellen's description of how the sound of a presenter's voice in a video was an important factor in whether she felt a video was a useful resource and I wanted to see if there was any similar feeling on the part of Gordon.

Q: "How important is the way the presenter looks and sounds to whether you see this [video] as a useful resource or not?"

A: "Um, I'd say pretty. I was watching a video the other day and the guy's voice was so awful sounding that I just didn't watch the video."

I noted that I now had two participants echoing similar sentiments about the value of a speaker's voice and I realized that this could be a problem for formal distance learning courses where the

instructor had recorded a set of lessons on video. However, Ellen was able to force herself to sit through the Khan Academy videos even though she did not like the presenter's voice. Gordon's dislike of the speaker's voice is significant as this was a significant criterion in whether he would select it as a resource for his learning. *Q: "And if you had a choice between watching a YouTube version of a teacher giving a lesson and talking to a teacher themselves?"*

A: "Ah, well, for me, if there's a video of them doing it and a live version of it, I would do the video because you can go back and watch it again. Also, it's easier to take notes. ... Even if they have a bad voice, and its distracting on the video, I can always go back and watch it again so I can really understand it."

This last response confirmed for me that Gordon's aversion to the speaker's voice in the video he mentioned likely had more to do with the fact that he had selected one video out of many possibilities and that he saw to specific reason to stick with it. If the information in the video is important enough, then objections to a presenter's voice are likely ignored.

Focus group

Contextual notes. This focus group took place at the end of the second week of research at GISS. It was the first group interview that I had ever conducted but I was able to use some of the techniques as an interviewer that I had learned from the one-on-one interviews. I had compiled a list of guiding questions (see appendix) for this interview that were based on the themes that had emerged from the one-on-one interviews. By the time I conducted this interview, I had developed a real sense of how this group of students managed information overload when they were selecting and evaluating Internet-based documents for their learning. I wanted to explore this concept with the participants as a group and I wanted to provide as much opportunity for students to further explore the ways that they engaged with digital multimodal documents. I decided that the best way to accomplish this objective

was to create a discussion that focused on the characteristics of good digital resources to learn from as if the participants were providing advice to future teachers.

The interview. After gathering the group of participants who were to be a part of this interview in the S.H.I.F.T. classroom, I explained that the purpose of this last interview was to get some insight into what they thought a good digital resource looked like. It was my hope that participants would provide a fuller picture of the criteria that they used when selecting Internet-based multimodal documents for their learning. Once the camera was running, participants initially chose to offer their individual perspectives on the useful features of Internet-based documents that had been discussed during their one-on-one interviews. The opening discussion largely concerned the best ways to organize printed text in a digital multimodal document.

Q: "When you're off to learn something, what makes a good digital document to learn from?"

Stewart: "I say it helps more if it's the segmentation of it. If it's just on giant blob of text, it's a lot more daunting and harder to get through and start on."

Gordon: "Yeah. Like, space it out. Anything like that is a lot better. Easier to read."

Stewart: "You know, pictures would help keep your interest in looking at the actual website and, personally, colours as far as organization goes would help."

Ellen: "I don't think you need pictures and flashiness as long as the text itself is good."

Many of the responses provided by participants at this point were largely reiterations of things that they had mentioned during their one-on-one interviews. My purpose for asking this question was to give participants the opportunity to further elaborate on the things that they had said during their first interviews and to see if these participants would enter into a discussion that resulted in new ideas being shared that were unique to the focus group. The idea that printed text should be presented in manageable chunks generated the most discussion. The general consensus seemed to be that Internet-

based documents that were most desirable contained blocks of text that were broken up with a noticeable amount of space, through the use of colour, or through the use of images. None of the participants elaborated on why this was the case though. The idea that a "giant blob of text" could be "harder to get through and start on" suggests that these participants wanted part of the work of selecting the main idea in a document done for them. The implication of this being that large blocks of printed text presented a challenge because participants were forced to read through them looking for the main ideas. Rather than reading through the entire document themselves, participants turned to Google to help them pinpoint what they are looking for.

This group's discussion about the best ways to organize a digital multimodal document for learning was taken up again half-way through the interview when I sought to learn more about how participants managed perceptions of information overload. Specifically, I set out to have participants discuss how they managed interactions with text, how they used hyperlinks, and how they used video. This would further provide insight into how they selected documents for their learning. Since I was trying not to be too leading in how I directed the interview, I offered up a general observation for consideration.

> Q: "Now, one of the things that... we've already touched base on in this conversation so far is this idea that too much information on a page can feel overwhelming. How much does the idea of too much information on a page affect whether you're willing to stay on a page and figure out what's on it?"
>
> Mary: "If you could categorize it, it would definitely narrow it down. So that would be quite a bit helpful and less overwhelming."
>
> Ellen: "I think that if it's a big block of text, I'm not going to want to read it. But if it's something like comments where it's, like, separate lines, it's a lot easier to read that."

Peter: "With a big block of text, you feel like you have to finish it to get the information."

Participants noted that the feeling of being intimidated by too much information on a page was best avoided when the information was organized into categories and when these categories were well spaced. The idea here seems to be that the presence of white space on a page helps participants to plan their approach to understanding the information on a page, including when to take a break from reading and when to anticipate a shift topic discussion. Participants' suggestions offered with respect to printed text are similar to what had been offered earlier in this interview but were now less concerned with the demarcation of the main ideas in a text and focused more on the quantity of reading required in order to find useful information. Participants seemed to be suggesting that the reason for breaking up long blocks of printed text into smaller blocks was to make the process of reading the text easier. Another possibility for participants wanting printed text broken up into manageable chunks is that they may have been experiencing difficulty following the logical progression of ideas within a paragraph that builds up to a central idea. Furthermore, it may also have been the case that these participants were trying to gather the main ideas in a block of printed text as quickly as possible and not spending the necessary time to understand their logical sequencing in the buildup toward a central idea. It seems that, rather than being interested in learning about why an idea is valid, participants were suggesting that they were only interested in the ideas itself. This accorded with discussions that occurred in the one-on-one interviews concerning performance orientation and participants' desires to simply complete assignments.

I continued my exploration of how these students managed information overload as it concerned the use of hyperlinks in digital multimodal documents. I discovered from the one-on-one interviews that participants only followed hyperlinks that were embedded in blocks of printed text if they were reasonably certain that the information located on the linked pages were crucial to their understanding of the information they were looking for. As was the case for Mary, this meant guessing at

the contents of the linked page and making a decision based on that guess. Because I was now interpreting this reluctance to follow hyperlinks as a way of participants actively managing information overload, I wanted to put it to the group for further discussion.

Q: "Hyperlinks... are a way of burying even more information either on the next page or as supplementary material. How should hyperlinks be used?"

Ellen: "Hyperlinks are good if you don't want to cram the page."

Peter: "It can be helpful but at the same time it can make it even more overwhelming. If you are reading something but you need to know the background behind it, then sometimes you get a long chain going backwards and reading what's behind it first."

Mary: "I know on Wikipedia if I'm reading something, it'll ... mention some guy and it's not that you need to learn about it but if you want to go more in depth then you can go read about him".

The responses from participants on the usefulness of hyperlinks suggested that hyperlinks did not inhibit their willingness to read the printed text that contains them or that hyperlinks make it more difficult to discover the main ideas in a block of text. However, all three answers suggest that hyperlinks were viewed as optional material that could be pursued by the reader if they saw the need for more information. By considering hyperlinks to be optional within a document, participants are making it possible for themselves to reduce the amount of information they have to interact with. This idea is especially evident in the observation that hyperlinks can lead to a "long chain going backwards" of foundational concepts that, ostensibly, disrupts the 'job' of completing an assignment. Their comments also reveal an understanding of the different ways that texts can be organized and structured, suggesting that their selection of a multimodal text for learning could be based on an initial examination of how the text is organized.

Next, I noted that this group used video as a tool for managing information overload. Since Peter

and Stewart had spoken at length about the usefulness of video in their one-one-one interviews when describing its utility for learning a new process or for learning an abstract concept, I wanted to know if other participants selected Internet-based documents containing video for similar reasons.

Q: "How useful is video as a learning tool?"

Peter: "Personally, um, as a visual learner, I really find, um, videos really useful because it shows you instead of having to read instructions. It shows you what you have to do."

Stewart: "I think it's good as a choice but it's also nice to have text at the same time if you want to read through that."

Gordon: "You can augment it with a video that adds information and then adds sort of the same information in text underneath it so you can choose which one you want to use."

This question generated a little bit more back-and-forth conversation between participants. However, participants were generally decided on whether they had a preference for printed text or video. Ellen advocated for the presence of printed text because of her practice of directly incorporating it into her assignments whereas Peter preferred being shown what to do "instead of having to read instructions." As such, video was only viewed by a few participants as a tool for managing information overload in specific circumstances.

I had become convinced that time was a contributing factor in how students selected and evaluated Internet-based documents for their learning. In particular, I saw a possible connection between students needing to manage information overload and the amount of time that they had allocated for their learning. Ellen's one-on-one interview made it very clear that externally imposed learning objectives (in the forms of assignments and tests) created a pressure on participants to reduce learning to just acquiring the information needed to complete assignments. This was a similar sentiment expressed by Mary. I wanted to see if the group could generate any more insight into this phenomenon.

Q: "So, how much does this idea that you only get a limited amount of time to do it affect the way you interact with a digital online course?"

Stewart: "This course doesn't feel rushed. It just feels "look, go at your own pace."

Mary: "The one downside of this course is that if you don't really do it on a regular basis and you just kind of wait then it will all kind of build up and then you will have to, like, do all your work near the end."

Stewart: "Because like you said, ... I keep putting off my work. It's, like, I have so long. It's a computer class. I can do this later."

The responses from participants to my question did not touch on performance orientation but rather, focused on participants' realizations that self directed computer-based courses didn't "feel rushed" and therefore lacked that same sense of urgency that motivated Ellen. Instead of feeling like they had to get a large quantity of work done in too small a time frame, these participants described a tendency to leave course requirements until near the end of the course. This means that all of the work that they were required to complete in order to pass the course was condensed into small amount of time, creating the same sense of urgency that Ellen described. Because these participants left their work until the last moment, they had to rush through the assignments. This meant that they were only interested in finding what they needed to know in order to complete the assignments.

My one-on-one interviews had shown me that participants were aware of their teachers' general disapproval of using specific Internet-based resources such as Wikipedia for their learning. The reason that I had heard from participants for not using Wikipedia was that "anyone can go in and change it." As a consequence, Wikipedia was ostensibly an unreliable resource. I wanted to explore this idea in greater detail with the group as it related to how they selected Internet-based documents for their learning but I wanted to address it in two stages: a) whether participants considered who had made the document

when selecting it for their learning and b) how participants judged the reliability of a resource.

Q: "A number of you have expressed this reservation at, uh, Wikipedia as a trustworthy source because you don't know who made it. How important is it to have sense of who made the document?"

Ellen: "Personally for me, um, it's not a huge deal as to who made it because I have the option of using other resources. ... I'll use these other websites to back it up."

Gordon: "As long as the source seems reliable. It doesn't matter much who made it."

The responses from participants as to whether it was important to know who made the document they were selecting for their learning indicates that participants did not see relevance in knowing who originated an idea. The Internet is inherently defined by its anonymity and participants seemed to think that one anonymous resource was as useful as the next. Many sources of information on the Internet do not specifically name an author and often, ideas on one website are reproduced exactly on another without acknowledgment of the original source. Whereas institutional learning emphasises the need to credit the originator of an idea, the Internet encourages the perception that ideas simply exist and that they are not owned by any one person. They are simply stored on a variety of websites waiting to be discovered. This fundamental misunderstanding about the ownership of intellectual property has given rise to the rampant piracy of copyright material that is affecting multimedia companies and it helps to explain Mary's lack of concern over plagiarism. Consequently, participants saw no reason to consider who made a document when they were selecting it for their learning as it was "not a huge deal as to who made it."

Participants also noted that teachers did not approve of Wikipedia as an information source because it is "unreliable." However, I did not get the sense that these participants had bought into the idea that Wikipedia was an unreliable source or that they were even worried about the concept of

reliability. Instead, I got the impression that participants were giving me contextually appropriate answers about Wikipedia because I was asking them about their everyday S.H.I.F.T. practices for selecting digital documents. They had been told by their teachers that using Wikipedia was not appropriate for school assignments and so they were repeating this to me. I wanted to see if I could get more information about how they considered the reliability of their Internet-based resources when selecting Internet-based documents for their learning.

Q: "So, what makes a source reliable?"

Mary: "If it has any connection to what you already know."

Peter: "Plus, if you found information about the same kind of thing on other websites and it all seems the same then you can just generally think that it's overlapped with this.

Stewart:"To be honest... there's not much false information. Like, on Wikipedia, I know that lot's of teachers say that it's really unreliable because anyone can write it but I find pretty much it's always quite reliable."

Peter: “Yeah, generally when someone’s going to set something up like that, they’re going to put the right information because there’s not much point putting fake information.”

The responses from participants on how they determine the reliability of information resources suggested to me that, in the same way they don’t seem to consider who authored a document, they did not seem to consider whether the information they are reading can be trusted. Rather, they considered only whether the information they were reading would be acceptable to the teacher marking their assignments. It is possible that this stems from a belief that information is something that just ‘exists’ on the Internet. Because I had not anticipated this response from the group, I did not have the presence of mind to inquire about whether they considered the bias of a writer, the bias of the website in general, and the completeness of the information they were working with. However, based on the theme of

students being externally motivated to complete their assignments within a specific time frame, it is possible that it is simply the case that it is easier to not critically examine the reliability of their sources.

I wanted to know more about how these participants valued social input when selecting and evaluating Internet-based texts for their learning. I reasoned that YouTube was a type of social interaction in that students were indirectly interacting with the narrator of the video that they were watching. I was also cognizant of the fact that YouTube pages featured a comment section where viewers could post questions about the video or share their impression of the video for other viewers to read. It was my suspicion that could get these participants to touch on this concept by asking them about printed text-based forums.

Q: "If you could have a forum or a comment section where other people doing the same course could interact with you... would that improve or detract from the experience?"

Peter: "Because some teachers are old fashioned, the teachers are like, 'do the work yourself'. And having a bunch of students collaborate, they might find that a form of cheating and they will tell you to not use it."

Mary: "I like collaborating personally."

Gordon: "It's brilliant. It just works so well. Any forums."

Ellen: “It could be a really helpful thing and it could work well or... it can always go bad.”

It seems that the social aspect of learning was a contributing factor when participants selected an Internet-based document for their learning. Participants generally agreed that social interaction and collaboration “works so well” but they also acknowledged that social interaction “can always go bad” when contributors go off topic or when contributors use their anonymity to say inappropriate things. Participant responses in favour of collaboration suggests that they see the potential of collaborative learning to reduce the amount of information they have to engage with (an important skill) by leveraging

the work that other students have already completed. I draw this last conclusion from Peter's fear that how they engaged in collaborative learning would be considered "cheating."

My question about the usefulness of comment sections to participants' learning experiences did elicit responses concerning how social interaction affected participants' evaluation of the usefulness of a page for learning as I had hoped. However, I did manage to generate a little discussion around whether comments on a YouTube video contributed to their perceptions of the usefulness of the video.

Q: "How many of you have contributed to comments, like, underneath a YouTube video...?

Stewart: "... like, if I'm watching an informational video on YouTube, um, I might go down and look at some of the comments and see some of the issues that some of the other people are having."

Gordon: "Yeah, it's a good idea to read their comments."

Participants' responses to this question suggest that social interaction on a page does contribute to evaluations of the usefulness of a page for learning. However, participants did not specifically discuss how they would change their behaviour given an overall negative reception by previous commenter's and the flow of our discussion prevented me from coming back to this issue. Based on responses by participants in one-on-one interviews, it is likely that participants would still be willing to view the material if they had the time and they felt it would provide the information they were looking for in order to complete the current assignment.

Chapter Five - Insights and Recommendations

The previous sections (single case analyses and group analysis) presented the themes that have arisen from my research concerning the ways that students actively manage information overload when selecting and evaluating the usefulness of Internet-based multimodal documents for their learning. These previous sections showed how my understandings of these themes emerged throughout my various interviews and I have shown how I progressively refined the questions that I asked participants based on responses I had received from them. In the following section I will distill the specific themes that constitute my findings for this research. I begin by describing the themes governing how students selected Internet-based documents for their learning.

Selecting Documents for Learning

I have discerned three significant themes in the ways that participants selected Internet-based multimodal documents for their learning with respect to managing information overload. First, participants' selections of Internet-based documents were externally motivated. In response to school specific pressures to complete assignments within a particular time frame or in order to achieve particular performance standards satisfying graduation requirements, participants selected learning resources that provided them with just the information they were looking for in as short a time period as possible. The meant reducing the amount of information that they engaged with to just what was necessary. Additionally, participants' teachers' endorsement of particular Internet-based resources or their teachers' proscriptions against specific websites contributed to whether a document was or was not selected as a learning resource. Resources that teachers asked participants to avoid were avoided (Wikipedia) and resources that were suggested as beneficial were selected. The specific factors governing participants' external motivation were the context they were working in, their performance orientation (assignment completion and course topic difficulty), and the amount of time they had

available to them (the S.H.I.F.T. block).

Second, participants' selections of Internet-based documents were purposeful. Participants' learning preferences governed the types of documents that they sought out for their learning. Where participants were visual learners, video was the preferred textual mode that they recruited for their learning. Other participants heavily preferred printed text and sought out the information they were looking for in this form. In most cases, participants would search for documents containing their preferred mode to the exclusion of other resources. In this way participants did not need to overcome the difficulty of engaging with a text mode they had difficulty using to locate the information they were seeking. Rather, participants purposefully selected documents that required a minimum of translation or interpretation with respect to the how this information was to be used. In the case of those participants who were attempting to navigate a user interface, video provided a visual representation of the information they were looking for. In the case of those participants who were looking to complete a written assignment, printed text was the preferred mode as it could be copied verbatim. Keywords were used to select the desired text and the context of this text could be ignored. The specific factors governing participants' purpose-oriented approach to the selection of Internet-based documents were their learning preferences and the task they were attempting to accomplish.

Third, participants' selections of Internet-based documents were based on their prior experience with selecting Internet-based documents for their learning. Participants employed a number of heuristics when using Google's search technology to locate documents on the Internet. Participants restricted document selection to the first two or three results returned by a search query as previous experience demonstrated these results were likely to be the most highly related to the search parameters they used. If a satisfactory selection could not be located by participants within the top three results, the search parameters used to perform the search would be reconfigured to include additional

keywords in order to limit the scope of a Google search or the search parameters would be adjusted to include different keywords with the hope of bringing up a different results set. Although this behaviour is common practice when researching information using a search engine, it is nevertheless an aspect of how students select texts from the Internet for their learning. As it pertained to the selection of videos on YouTube (also powered by Google search technology), participants were most likely to preference videos with the highest viewer count as these videos would be ranked highest in the search results list. Participants interpreted higher viewer counts as an endorsement of the usefulness of the video to their learning needs.

Evaluating Documents for Learning

I have discerned two significant themes in the ways that participants evaluated Internet-based multimodal documents for their learning with respect to managing information overload. First, participants evaluated a document's usefulness on the accessibility of the information it contained. Accessibility was judged on how the document was formatted, how long it took to locate the desired information, and how comprehensible the information was. With respect to documents containing printed text, participants overwhelmingly preferred the use of space to break up long blocks of printed text into smaller sections. Smaller blocks of printed text were considered to be more manageable in that participants perceived that they were contending with only a single idea at a time. Additionally, line spacing was a consideration in determining accessibility. Documents with densely packed text were dismissed for other documents with seemingly less text. Finally, colour played a part in determining accessibility. Printed text colours that changed frequently throughout the text or that were difficult to read because it did not contrast enough with the background made a document more difficult to read and therefore participants were more likely to discard it.

Accessibility was also judged by participants on how long it took to locate the information they

were looking for. For Internet-based documents containing printed text, participants indicated a preference for having the main ideas conspicuously set apart through the use of a background colour (rather than printed text colour). Video was also preferred by some participants because it was seen as a more accessible format. In this case, being able to pause a video or being able to jump to an arbitrary point in the video allowed participants to quickly engage with just the information they were interested in. Documents that made information easy to locate were seen by participants as being most useful to their learning because they did not need to spend the time to comb through everything on the page looking for the information they wanted.

The second significant theme describing the ways that participants managed information overload when evaluating Internet-based multimodal documents for their learning is the reliability of a resource. As it was made clear during the group discussion, participants did not critically examine a document for completeness or bias when considering its reliability. Rather, reliability was judged on peer approval (number of views and commentary) and on the match between actual content and expected content. By being uncritical about the information they were using, participants did not need to view multiple documents on the same topic and decide which document had the most accurate information. With respect to peer approval, participants judged YouTube videos with the highest viewer numbers as highly reliable. The rationale behind this perception was that videos that did not provide useful information would not have been viewed as many times. Participants also took into consideration peer comments on YouTube videos when judging for reliability. Videos with comments negatively describing the content were viewed with suspicion and were more likely to be avoided as unreliable sources of information.

The reliability of a document was also judged by participants according to whether the information it contained matched their expectations. If a document contained information that was not

immediately applicable (e.g. a different version of the software interface) or did not correlate with what participants already knew, then participants were likely to find it less useful for their learning. This is because participants detected a mismatch between what they thought they wanted to find and what they actually found. Rather than find a way to resolve this mismatch, the document was discarded as unreliable.

Managing Information Overload

In the end, the themes listed above contributed to participants' attempts to limit feeling overwhelmed by the amount of information available to them when using Internet-based multimodal documents or their learning. Participants did this by making an active effort to reduce the amount of information they needed to engage with in order to address their learning requirements. Google's search technology provided participants with a way to rapidly pinpoint the information they were looking for and participants strategically selected text modes that best addressed the questions they were trying to answer. The single most important factor that drove participants to actively manage perceptions of information overload was the amount of time they had made available to search for the information they were looking for. The Internet contains far too much information to read through everything that might be connected to a search for information and deciding what should be read and what should be disregarded can sometimes be an overwhelming challenge. Participants attempting to complete an assignment just do not have the time to look through every document that might possibly be connected to what they are looking for. Complicating participants' tasks of deciding what to read when looking for information on the Internet is their time management practices. Participants seemed to be condensing assignment completion into a small time frame and this increased the possibility of feeling overwhelmed by the sheer number of documents to choose from. Finally, because assignments were governed by a set of externally imposed time constraints, participants needed to get their assignments completed within a

definite timeframe in order to satisfy requirements for course completion.

Implications for Students

Knowing how to manage a large quantity of information when learning is a valuable skill that all students should learn because they are entering a future where most of their learning will be based on information that is digital and abundant. While learning how to manage information overload should be a skill that students are helped to develop during their formal education, there are certain consequences of our present performance-based education model that affects not only students engaged in self-directed computer-based learning, but also students who engage in computer-based learning within more traditional classrooms settings. The most significant danger of the practises that students' develop when using Internet-based documents for their learning is that they become so selective in the information they choose to engage with that they limit opportunities for deep, meaningful, or incidental learning. This has the unfortunate consequence of limiting the connections that they can make with this incidental learning in the future and limits their opportunities to use this incidental learning in creative ways.

Google is a thinking crutch. If students are to leave our classrooms ready to succeed in an information-based economy, then they need to be able to creatively and critically interact with information. This enables students to be producers of new knowledge and to hone the skills that they need to contribute meaningfully to society later on in life. However, students need to be supported by teachers to become critical thinkers, and this includes helping students to think critically about the Internet-based resources they use. One consequence of students developing techniques for mitigating perceptions of information overload is that search technology can become a crutch in their thinking processes. By this I mean that students may be inclined to let Google pinpoint nicely synthesized synopses of the information they are looking for rather than read through a document in search of this

information themselves. For example, if the results produced by a set of parameters did not seem immediately provide participants with a concise treatment of the information they were looking for, they often found it easier to change the search parameters rather than look through each of the results in the list to determine if they were in fact useful. While this is a common practice when searching for information at a library, the implication here is that students may come to depend on search technology to furnish them with only the information they want and, as a result, they do not develop the ability to search through a collection of loosely related material in order to synthesise an answer that fits their own needs. Moreover, search engines lend themselves to the practice of searching for factoids. Google and Bing highlight the locations of keywords in the text corresponding to each result in the list. Rather than spend the time to methodically comb through each document in the result list, participants jumped to the part of the page that had been referenced in the search results. This meant that participants limited the amount of thought they applied to understanding the information in its context and they limited their opportunities to make connections between this information and what they already knew.

Limited mastery. Another consequence for students managing feelings of information overload is that they may not really engage with an idea or concept and explore it from a variety of angles, or that their exploration of an idea is limited to just what is necessary to complete an assignment. This limited engagement with ideas is only further exacerbated by Internet-based search technologies that make it possible to pinpoint just the information that they are looking for. In turn, students limit the amount of synthesis they perform because they are not really interested in mastering the ideas they are working with. Students may also become less patient with traditional paper-based information such as textbooks because they have become accustomed to using search technology to jump to what they are looking for without having to progress page after page. A long-term implication of this practice may be that students experience even lower retention of their learning over time then is already the case.

Learning as a game. Another implication of the practices for selecting and evaluating Internet-based documents that have arisen from this research is that students are more likely to treat assignment completion as a game. This is not to say that the gamification of education is, of itself, a bad thing. Instead, I am suggesting that students' attitudes towards learning are altered by the instant accessibility of information on the Internet and the ease of applying it to assignment completion. When information can be accessed almost instantly, then students are going to be less likely to reflect on their learning and the usefulness of the assignment to their overall education. As a consequence, the completion of the assignment becomes the sole focus of finding information on the Internet and learning becomes a type of game. In this game, the assignment constitutes the rules to be followed and the Internet becomes the path to completing the game's objective.

Part of the reason that learning becomes a game is because it is externally motivated by grades and because learning objectives are set by the teacher. Instead of students embarking on a program of learning that genuinely interests them, they are often given a choice of topics that they did not personally choose and are instructed to complete assignments based on this topic. The vast quantity of information on the Internet affords students the unprecedented opportunity to engage with a wide selection of ideas and topics that are not possible under a unified classroom-based teaching approach. While assignments provide a basis for teacher assessments concerning student performance, these assignments are constrained by time limits and a grading scheme. This limits students' motivations to engage with ideas on a deeper and more meaningful level. If students are to embrace the concept that they are being prepared for a lifetime of learning, then they need to be encouraged to take responsibility for their learning. This begins by incorporating students' interests into classroom assignments and diminishing the importance of grades in the learning process. Without the pressure to perform, students are less likely to select and evaluate the usefulness of Internet-based multimodal documents singularly

on the basis of assignment completion.

Implications for Teachers

The ways that students select and evaluate Internet-based multimodal documents also has implications for teachers. Students need to be supported in the development of skills to use Internet-based information for their learning. This includes providing students support in using search technology to locate information, critically evaluating the usefulness of information on a page, and not letting the technology they are using substitute for their own thinking.

Encourage critical selection and evaluation. Students arriving in today's classrooms come with a wealth of experience using computers to access information on the Internet and, when asked about where to find information on a particular topic, many students will suggest Google as their first stop. It is therefore tempting to assume that students arrive in the classroom having sufficiently developed the necessary skills for selecting and evaluating Internet-based texts suitable to their learning needs. While teachers often provide some direction about how to select appropriate sources of information on the Internet and will often caution students not to use publically generated texts (Wikipedia) as authoritative sources of information, the decisions about whether to use other texts are left up to students. In order to limit students' tendency to just use Google to search for factoids, teachers should go beyond discussions about reliable information resources and instruct students on a variety of techniques for selecting and evaluating Internet-based multimodal texts for learning.

Provide more time. The techniques that students have developed for selecting and evaluating Internet-based texts are, in part, a response to the time constraints that teachers impose on assignments and that students impose on themselves by not properly managing their time. One way of reducing students' exclusive use of Internet search technology to locate factoids that satisfy assignment criteria is to provide a more open-ended timeframe for assignment completion. However, this is not likely to be

enough on its own as students will also need to be supported in developing the ability to manage their own time more efficiently. Even then, students are still likely to be focused exclusively on assignment completion and the use of factoids. Short of completely changing the school calendar and current assessment practices to graduate students by age groups, students could be required to complete fewer assignments with the idea being that students will have been helped by teachers to develop a learning plan that addresses the prescribed learning outcomes within just one or two assignments per reporting period. This would also have the effect of moving the locus of students learning internally as each assignment would be cast as an opportunity for personal transformation.

Support strategies for understanding large quantities of printed text. Support strategies for understanding large quantities of printed text. A student's future successes will depend on his/her ability to successfully select and evaluate texts for learning the new skills that they will need in order to adapt to the changing conditions of a knowledge-based economy. Because Internet search technology makes information instantly accessible and makes it trivial to narrow in on a specific idea on a page, students will progressively become less tolerant of large blocks of printed text in so much as they will be less willing to spend the necessary time to read through the printed text. This means that they will reduce their opportunity to understand the relevant contextual details leading up to the document's central idea. While it may be tempting to ascribe a students' reluctance to engage with a large block of printed text to a personal attitude that they have enculturated, it may be more beneficial to consider that these same students may not have developed the skills for reading printed text. Rather than proceeding from sentence to sentence, following the logical progression of an author's ideas, these students may be trying to just scan through the entire page as quickly as possible and, as a consequence, are unable to see how these different ideas fit together.

My Personal Transformation

The last four years that I have spent completing this project have greatly changed my thinking in relation to how I learn and how I will teach. With regard to my personal learning techniques, I state above that when I started this project I had begun to experience a general impatience with the task of locating information on any particular topic and that completing assignments had become 'just a game' (or an adapted set of learning and compositional strategies) for me. As I grappled with my quest to better understand other students' practices for selecting and evaluating Internet-based multimodal documents, I realized that I was simultaneously grappling with my own need to understand my own practices for interacting with the Internet-based documents that I was using for my research. One of the greatest insights that I arrived at regarding my own tendencies to minimize engagements with massive amounts of information was that my personal feelings of being lost in a sea of data were making me feel anxious. As I would try to focus on my personal objectives when searching through databases of peer-reviewed journals, it became clear to me that the best way to deal with these feelings of anxiety were to deepen and slow my breathing and force myself to take small breaks. By allowing myself more time to locate the information I was interested in, I was able to better understand what it was that I was looking at on the screen and to relax as I was doing it. While my personal discovery may seem to be in the realm of 'common sense' to an outside observer, I realized that this was not a technique that I had been at liberty to develop as a student in our public education system as the pressure of course time-lines and the pressure to complete a significant number of assignments per semester required me to develop learning behaviours that minimized time expenditures. This was something I had to unlearn in order to arrive at the critical insights included in this project. Although I am not presently certain of the best way to incorporate this insight into my future teaching practices in a traditional classroom, it is something that I will continue to reflect on into the future.

Regarding changes that have occurred in my approach to teaching, I am now more cognizant of the social nature of learning. Although I underwent a post-degree program in Education, I entered into my graduate program without the slightest understanding of the social and cultural basis for all learning. Because I was a successful student, I had developed an understanding of learning that was based around assignment completion, deadlines, marking criteria, and teacher-expectations. Further reinforcing my ignorance was the fact that I had successfully completed my teaching practicum by assuming the posture of knowledge disseminator at the front of the classroom and used assignment completion as a tool for assessing learning. I arrived in my graduate program as the product of twenty-five years of education under this model. This made my task of understanding the processes students use (and I use) when selecting and evaluating Internet-based texts all the more difficult as the Internet is a pervasively social medium — I just did not know it when I started because I was lacking any understanding of the social nature of learning. After spending an agonizing six months reading and discussing James Gee's treatment of sociocultural theory, I began to realize that the teaching practices that I had displayed in my practicum were the expression of a traditional approach to teaching that did not reflect the reality of learning. Going forward, my teaching practices will be based in an understanding that students' literacy practices are based on the values, motivations, and beliefs that are specific to their social context and it will be up to me to help to create a context that enables students to reach their full potential as learners as a member of a group of learners.

Finally, I have begun to develop an interest into the role that video plays in the formation of affinity groups on the Internet. This interest is an extension of the work that I have done in this project and arises in relation to the ability of video to not only transmit a vast quantity of verbal and non-verbal information, but to also transmit a sense of membership in a group of similarly-interested individuals. This insight has slowly developed in my mind as, over the course of this project, I have developed an

interest in producing music on the computer and I discovered that my choice of a Digital Audio Workstation (DAW) for this activity had more to do with whether a community of users existed around this product on YouTube rather than the capabilities of that DAW itself. It seemed to me that if I could find videos where knowledgeable individuals discussed their experiences with my DAW of choice, then the program became more valuable for me and the information that they shared became more trustworthy to me. As I continue my career as a teacher, I will continue to reflect on the best ways of using video in my teaching in order to enable students to feel socially connected to the learning that they are doing in the classroom.

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Appendix 1

Participant Consent Form

A QUALITATIVE INQUIRY INTO HOW HIGH SCHOOL STUDENTS DEVELOP AN UNDERSTANDING OF THE DIGITAL MULTIMODAL SCREEN FOR THEIR LEARNING

You are invited to participate in a study entitled "A qualitative inquiry into how high school students develop an understanding of the digital multimodal screen for their learning" that is being conducted by me, William McColm. I am a graduate student in the department of Curriculum and Instruction, in the Faculty of Education at the University of Victoria and am conducting this research as part of the requirements for my Master's degree.

My research is being conducted under the supervision of Dr. James Nahachewsky. If you have any questions about this study you may contact me through email (wmccolm@uvic.ca) or my supervisor at 250-721-7780 (jnahache@uvic.ca).

Purpose and Objectives

The purpose of this research project is to understand how you, as a high school student, select and use images, video, graphics, and text from the Internet or other digital sources for your learning.

Importance of this Research

Research of this type is important because it will enable teachers to support students in developing skills for engaging academically with digital multimodal documents that originate both inside and outside of the classroom. This research is necessary since the proposed Personalized Learning initiative of the B.C. government places a greater emphasis on the role of digital literacy in contemporary education.

Participants Selection

You are being asked to participate in this study because you are a student at Gulf Islands Secondary School (GISS) in the S.H.I.F.T. program whom has expressed an interest in sharing information on how you learn from information on a computer screen. You have been given this consent form based on your interest in this research and in consultation with your classroom teacher. Please note: not everyone who submits a consent form may be selected as a participant in this study. Because this research study only has room for eight participants (preference being given to two each from grades nine, ten, eleven, and twelve), your selection as a participant will depend on the order in which your consent form is received. If it occurs that during the selection process two students from your grade submitted consent forms ahead of you, but less than two consent forms have been received (including all forms submitted before the deadline) from students in any of the other grades listed above, then you will be selected as a participant if less than eight participants in total have been chosen for this study. The selection process will be finalized one week after the date that you have received this consent form. All students will be contacted in person by the researcher regarding whether or not they have been selected as participants.

What is Involved

If you consent to voluntarily participate in this research, your participation will include a one-on-one interview of approximately 45 minutes and a group interview of 45 minutes with two other students participating in this research. Each of the two interviews will occur on-site at GISS. During the one-on-one interview, you will be asked questions about how you choose and understand information on YouTube (http://www.youtube.com) and on Wikipedia (http://www.wikipedia.org) while using a laptop that I provide. During the group interview, you and two other participants will talk about how and why you choose different sites and sources of information online for your school work. All materials viewed

during each interview will only contain information identified as appropriate by the BC Ministry of Education.

All of the interviews will be recorded on video for the purposes of analysis by the researcher. Portions of these videos will be shown to other participants during the group interview (the second interview in this study) for the purpose of encouraging further conversation. As well, portions of these videos may be used by me when representing my data to my committee during oral defense. Beyond the uses stated above, these videos will not be shared or made public. I will also be making notes during the interviews about your processes utilized when interacting with digital texts that will be recorded using screen-capture software on the research computer. Transcripts will be made of all dialogue recorded during these interviews.

All data – including field notes, video recordings, screen captures, audio recordings, and interview transcripts will be used by me for analysis and representation in my MA thesis. Selected digital screen-captures will be used in representing the data to my committee during oral defense. Portions of participant dialogue will be transcribed and included in the final report. The identities of all participants will remain confidential in the final research report.

Inconvenience

You will need to leave the S.H.I.F.T. classroom twice during February for a total of 1.5 hours.

Risks

There are no known or anticipated risks to you by participating in this research.

Benefits

The potential benefits of your participation in this research include providing you with insight into your own processes when using digital documents for learning, and contributing to teachers' understanding of how students interact with digital documents. Your participation will contribute to

future considerations for how to effectively utilize computers in the classroom for learning.

Voluntary Participation

Your participation in this research is to be completely voluntary. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study, any data linked to group data (focus group discussions) will be used in summarized form with no identifying information. All other data pertaining to your participation in this study will be destroyed and will not be utilized in the final report prepared for this research.

On-going Consent

To make sure that you continue to consent to participate in this research, I will remind all participants prior to beginning each interview that participation is completely voluntary and that you may withdraw at any time if you so wish. Both you and your parents are required to consent to participation in both interviews described above as part of the consent process. You must provide your explicit consent by providing your initials in the "Consent For Multiple Interviews" section on the last page.

Anonymity

In terms of protecting your anonymity, participant names will not be used in the final report for this research or in transcripts created from videos.

Confidentiality

Your confidentiality and the confidentiality of the data will be protected by ensuring all will be safeguarded in digitally encrypted computer files on a hard drive owned by the researcher. Paper files will be stored in a locked brief case.

Dissemination of Results

It is anticipated that the results of this study will be shared with others in my MA thesis.

Disposal of Data

All electronic data from this study will be erased. Any paper copies of data will be shredded.

Contacts

Individuals that may be contacted regarding this study include William McColm (researcher - wmccolm@uvic.ca) and Dr. James Nahachewsky (supervisor - jnahache@uvic.ca; 250-721-7780).

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Please note: in order to be selected as a participant in this research, both you and your parents are required to sign this consent form. This includes you and your parents' explicit agreement (see below) to the visual recording of interview data and its usage for the purposes of analysis and sharing during the group interview. Your signature below indicates that you understand the above conditions of participation in this study, that you have had the opportunity to have your questions answered by the researchers, and that you consent to participate in this research project.

Name of Participant	Signature	Date
Name of Parent/Guardian	Signature	Date

Visually Recorded Images/Data Participant to provide initials, *only if you consent*:

Videos may be taken of me for: Analysis _____

Group interview discussion _____

Visually Recorded Images/Data Parent/guardian to provide initials, *only if you consent*:

Videos may be taken of my child for: Analysis _____

Group interview discussion _____

Consent For Multiple Interviews Participant and parent/guardian to provide initials, *only if you consent*:

I agree to participate in a one-on-one interview (participant) _____

I agree to participate in a group interview (participant) _____

My child may participate in a one-on-one interview (parent/guardian) _____

My child may participate in a group interview (parent/guardian) _____

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Recruitment Script

Thank you everyone for your attention. My name is William McColm and I am graduate student in the department of Curriculum and Instruction, in the Faculty of Education at the University of Victoria.

What is the nature of my research and how will data be used

As I look around the S.H.I.F.T. classroom, I notice that just about all of you are sitting in front of a computer. Believe it or not, the computer is a relatively new invention that has only really been used in our school systems in a big way for the last 15 years or so. Researchers have been curious for years now about how using computers affects the way we learn when we are at school. However, with each new advance in our computer technology that allows us to do more with it than ever before, more research has to be done to understand the impacts on students' learning. My research specifically focuses on how you, as high school students, select and use images, video, graphics, and text from the internet or other digital sources for your learning. This includes how you might use sites such as YouTube and Wikipedia.

Now, if you consent to voluntarily participate in this research, your participation will include a one-on-one interview of approximately 45 minutes and a group interview of 45 minutes with two other students participating in this research. Each of these two interviews will occur on-site at GISS. During the one-on-one interview, you will be asked questions about how you choose and understand information on YouTube (http://www.youtube.com) and on Wikipedia (http://www.wikipedia.org) while using a laptop that I provide. During the group interview, you and two other participants will talk about how and why you choose different sites and sources of information online for your school work. All materials viewed during each interview will only contain information identified as appropriate by the BC Ministry of Education.

Each of the interviews will be recorded on video for the purposes of analysis by me later on. Portions of these videos will be shown to other participants during the group interview (the second interview in this study) for the purpose of encouraging further conversation. As well, portions of these videos may be used by me when representing my data to my committee during oral defense. Beyond these uses, videos will not be shared or made public. I will also be making notes during the interviews about the processes you utilize when interacting with digital texts that I will record using screen-capture software on my laptop. I will also be making transcripts of all dialogue that is recorded during these interviews.

All data – including field notes, video recordings, screen captures, audio recordings, and interview transcripts will be used by me for analysis and representation in my MEd thesis. Selected digital screen-captures will be used in representing the data to my committee during oral defense. Portions of our conversations will be transcribed and included in my final report. Real names will not be used in my thesis and all your identities will be confidential in the final research report.

How participants will be selected.

Please note: not everyone who submits a consent form may be selected as a participant in this study. Because this research study only has room for eight participants (two from grades nine, ten, eleven, and twelve), your selection as a participant will depend on the order in which your consent form is received. If it occurs that during the selection process two students from your grade submitted consent forms ahead of you, but less than two signed consent forms have been received (including all forms submitted before the deadline) from students in any of the other grades, then you will be selected as a participant (based on the order in which your consent form was received) if less than eight participants in total have been selected for this study. The selection process will be finalized one week after the date that you have received this consent form so please have your consent form into your

S.H.I.F.T. before [day of week 7 days after distribution of consent forms]. All students will be informed by me regarding whether or not they have been selected as participants.

Q&A regarding how case study data will be used and when participants will have access to research data.

Would anyone like to ask any questions? Is everyone clear about how information will be collected and used in this research study? Distribute consent forms. Emphasise the requirements for parental / guardian consent.

For those of you who are still interested in participating in this study, please take this consent form home to your parents/guardians. Remember, both you and your parents/guardians must sign the consent form, including providing your initials in the sections concerning the video recording of interviews and participating in both a one-on-one interviews as well as a group interview.

Thank you all for your interest in my research and I look forward to working with those of you who elect to become participants.

Sample Questions for Semi-structured Interviews

One-on-one interviews.

Q: Have you ever used Wikipedia / YouTube to search for information before? Can you think of any examples?

Q: What was your impression of the usefulness of the information you found on Wikipedia / YouTube? On a scale of 10, how would you rank the value of the information you found?

Q: For any page on Wikipedia / YouTube, what part of the screen / page has the information that you are looking for? Are some parts of the page more important to you than others?

Q: For any page on Wikipedia / YouTube, what modes (textual, video, audio, pictorial) do you see as the most useful information format? Is this answer the same for both YouTube and Wikipedia?

Q: What textual modes do you spend the most time on when visiting a page on Wikipedia / YouTube? How do these modes relate to the type of information you are interested in?

Q: How do you decide when you are done viewing a page on Wikipedia / YouTube?

Q: If you encounter a link to another page as you are reading a page on Wikipedia / YouTube, do you typically wait until you are done on the current page before following the hyperlink, do you ignore the hyperlink, or do you follow it as you encounter it.

Group interview. The questions asked in the group interview were designed to be similar to the questions asked above but were derived from actual examples of participant interaction with digital multimodal documents as discovered in the one-on-one interviews. These are the questions that were finalized only after the one-on-one interviews were completed.

Q: What makes a good digital resource?

Q: How important is choice when you are engaging with Internet-based multimodal documents?

Q: How valuable is interaction with other people in an online environment when you are learning from Internet-based texts?

Q: How much does the quantity of information on an Internet-based text factor into whether you value it as a learning resource?

Q: How does text formatting contribute to your evaluation of a page's usefulness as a learning resource?

Q: Do you find any advantage in selecting resources that contain a mixture of video and printed-text?

Q: How often do you follow hyperlinks embedded in a resource when you are learning from an Internet-based text?

Q: What advice would you offer to teachers who are creating digital multimodal resources?

Permission to Conduct Research in SD64

To jhopkins

Greetings Jeff,

My name is William McColm. I am the graduate student you met last Friday at UVic during the presentation by John Abbott. You mentioned during our conversation that you would be willing to have me conduct research for my thesis in your district. I spent the weekend thinking about your invitation and, since I am currently at the stage of putting together my research proposal for the university, I thought I should double-check that you are willing to have me before I composed a plan of action with the university. Since SD64 is committed to personalized learning for the 21st century, your district is a natural fit for my research into student engagement with digital texts. I look forward to hearing from you.

Best regards,

William McColm

Graduate Student (Curriculum Studies) at UVic

From jhopkins:

Yes, William. Still interested and supportive. It might be worthwhile for you to check on our state-of-technology to ensure we have the infrastructure that you hope to study! Otherwise, I'm happy to see your research proposal. Just so you know, our Board has the final say, but I would certainly recommend that they support your research. If you write a letter (email is fine) addressed to me with a copy of your research proposal and ethics proposal, I can get you the formal "yes."

Jeff

Jeff Hopkins
Superintendent, School District 64 (Gulf Islands)