TECHNOLOGY AND DISABILITY IDENTITY:
"NOW YOU SEE ME, NOW YOU DON'T"

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Abstract

This qualitative study examines how students' identities are constructed when technology and disability intersect. Understanding how technology constructs the identities of students with invisible special needs such as learning disabilities is critical to determining why students are resistant to, or accepting of, assistive technology pedagogy.

The primary source of data for the study was in-depth, phenomenologically based interviewing using structured, open-ended dialogue. Three Ontario secondary schools provided the setting for the study. Participants included five students with learning disabilities who are users of assistive technology, two parents, two teachers, and two assistive technology coaches. A grounded theory methodology was used to permit theoretical categories to emerge from the data. The purpose of the research was to investigate: (a) Is the promise of technology compromised by the visibility of technology support, and how do students who access technology through the Special Equipment Amount (SEA) negotiate any related social dynamic? (b) What does the diagnosis of a learning disability mean to students and their parents? (c) What are the particular experiences and contexts within which students that access technology through SEA are trained? and (d) How do teachers, parents, and trainers see their role in the technology assistance program?

The research findings indicated a strong positive association between the variables of awareness, understanding, and acceptance. Participants' responses revealed: (a) a direct relationship between students' lack of awareness of having a

disability and lack of knowledge regarding why they have a SEA laptop with access to Assistive Technology (AT), (b) a strong connection between students' awareness and understanding of the diagnosis of LD and their willingness to "own" or accept a disabled identity in order to access necessary supports such as AT, and (c) overall, that awareness, understanding, and acceptance of a LD appeared to significantly impact students' willingness to happily engage with AT. Beliefs expressed by participants about responses to AT revealed tensions between the promised empowerment of AT and the negative self-perception related to AT use. Students appeared to be unwittingly trapped in a cost-versus-benefit dynamic, such as independence and improved abilities versus inferior status and social labelling. Consistent with the literature on stigma related to invisible disabilities, students in some instances appeared to shoulder the burden associated with the social cost of being perceived as academically inferior. Participants perceived several reasons for lack of engagement and abandonment of SEA equipment, including stigmatized identities, compromised self-esteem, and indifference. Although these reasons prove to be barriers to successful integration and engagement with SEA equipment, in this study, stigma appeared to be the most powerful recurring explanation for AT abandonment.

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Chapter 1: Introduction

> "I've been searching for you… what you are doing in here?" a student asked as he rushed through the door of the Special Education Resource room. Recognizing the look of confusion and embarrassment on my student's face, I quickly answered, "I'm helping Philip [pseudonym] with a few things on his computer." Philip's friend quickly responded, "Why does she need to help you?" "I just need to show Philip some programs he has never used before," I replied. With a confused look on his face, Philip's friend turned to him and said, "The gym class is going for a run around the neighbourhood. Are you coming?" Philip turned to me with an apologetic look and said, "Miss, I have to go because if they [the class] leave me I will not be able to find them." With that, a previously engaged and enthusiastic Philip walked out of the Special Education Resource Room behind his friend. (Researcher account, 2009)

This anecdotal account provides a window into the complex experiences of students who access Assistive Technology (AT) in various educational contexts through Special Equipment Amount (SEA) funding. Philip's reaction to his friend's appearance was an all-too-common one, indicating students' fears of being negatively appraised by their peers while receiving AT training. Having spent several years as an AT trainer in K-12 classrooms, I became increasingly aware that, in order to deal with the confusion and ambivalence they felt in various educational contexts, SEA students employed a range of impression management strategies (Goffman, 1963). In reflecting on my practice, I became preoccupied with the issues that drove students' responses to AT. This subject became particularly intriguing given the growing number of students in elementary to secondary schools receiving special education support through various sources, including SEA funding.

A Canada-wide Elementary to Secondary Education Survey (ESES) reported over 142,000 students as having learning disabilities and behavioural disabilities in 2009/2010 in the Province of Ontario (Statistics Canada, 2011). According to the same survey, by 2009/2010 the number of students requiring special education assistance increased to 586,000 from 532,000 in 2001/2002. Within the last decade, in response to the growing educational demands of students with disabilities, AT pedagogy (Watts, O'Brian & Wojcik, 2004) has gained popularity in a number of Ontario school boards. The term "Assistive Technology" denotes "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of children with disabilities" (Reed & Bowser, 2005, p. 62).

It is the policy of the Ontario Ministry of Education that students with special education needs are eligible to receive funding for AT equipment, devices, and software, based on the recommendation of a qualified professional (Ontario Ministry of Education, 2011). These SEA funding guidelines[1] stipulate that equipment acquired through SEA is intended to provide students with accommodations that are critical to their ability to access the Ontario curriculum or an alternative course, program or school.

Although eligible equipment under SEA funding ranges from educational tools to personal care and safety equipment, the focus of this research is on educational

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[1]The current SEA Funding Model reflects changes to the *Special Education Funding Guidelines: Special Equipment Amount (SEA) 2010-11.*The revised guidelines were published Spring 2011 and are available at http://www.edu.gov.on.ca/eng/funding/1112/2011_12_SEA_Guidelines.pdf.

technology assistance for students identified as having special learning needs. These students are provided with AT in the form of computer equipment and software for school and home use, as well as software training within their schools. External AT trainers conduct training in the use of specialized software programs that have been prescribed by school board psychologists or other professionals. With the exception of students requiring desktop computers, SEA students received a particular brand of laptops in identical carrying cases. At the time of this study, the brand of laptop provided to SEA students was not commonly used by the general student population. In some schools, the laptops were stored in the resource room and retrieved by students as needed.

Hopkins (2004) suggests that AT enables individuals with disabilities to negotiate areas of challenge through a range of supports. Although AT is not a panacea for students' learning needs, researchers have found that it facilitates greater efficiency and independence in reading and writing tasks (Forgrave, 2002), allows students opportunities to access curricula (Edyburn, 2005), and presents potentials and possibilities for students with disabilities (Okolo & Bouck, 2007).

It has been well-documented that, theoretically, AT is intended to provide a more level playing field for students with learning disabilities (Kintsch & DePaula, 2002; Hopkins, 2004; Edyburn, 2005; Scherer, 2005; Graham & Richardson, 2012). However, my experience as an AT coach in K-12 settings for four years allowed me to see firsthand the myriad challenges and tensions that accompany negotiating a disability identity in schools and the attendant complication involved in the delivery of technology

assistance. The extent and quality of these challenges and tensions, and their potential impact on student achievement, have not received significant attention in the literature.

The focus of this dissertation is on how students' identities are constructed when technology and learning disabilities intersect. Although many students experience invisible disabilities such learning disabilities, mental illness, communication disabilities, and emotional challenges (Canary, 2008), this study is specifically focused on students with a learning disability diagnosis. Educators must understand how technology contributes to the identity construction of students with invisible special needs, such as learning disabilities, if they are to understand students' attitudes and responses to the technology that the school provides.

Background

This study grew out of my involvement since 2006 in Assistive Technology (AT) training for students accessing AT through Special Equipment Amount (SEA) funding. Most of the training sessions I conducted focused on exposing students to various AT programs to assist them with challenges in the areas of reading, organization, comprehension, writing, and general study. Our service delivery model was predicated on the notion that AT reduces barriers to learning (Raskind & Higgins, 1998) and provides compensatory alternatives for challenges in key academic areas, including reading, writing, and spelling (Bryant, Bryant, & Raskind, 1998; Forgrave, 2004). Despite conducting what I consider a successful series of training sessions, all too often I observed that a large number of students were not willing to embrace or engage with AT resulting in a high rate of abandonment of AT equipment.

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When I began my study in 2007, I provided AT training in a school board reflecting an ethno-culturally and academically diverse student population. I was driven by the desire to understand how students' responses to technology assistance were shaped when technology and disabilities intersect. In 2009, I had the opportunity to work for another school board in schools that reflected an entirely different demographic student profile. The student population comprised predominantly white middle-class students. Despite the varying demographics between the two school boards, one constant remained: a large proportion of SEA students were still not willing to embrace AT.

The purpose of this study was to explore how students made sense of the visible nature of AT given the invisibility of learning disabilities. As an AT trainer and researcher I undertook this study from an insider-outsider position fully committed to the delivery of educational technology for all students. Furthermore, it was my goal to use this study to uncover ways for students to happily and effectively engage with assistive technology.

Definition of Terms

This section provides a definition of the key terminology used in this thesis and includes the primary research questions. The chapter concludes with the significance of the study and a look at assistive technology in practice.

Assistive Technology: The term "assistive technology" is widely used to describe technology used by students with learning disabilities. The official definition of assistive technology is "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain,

or improve functional capabilities of children with disabilities" (Reed & Bowser, 2005, p. 62).

Student with special needs: A term used to describe students who have a disability falling under established criteria, allowing special funding from the government to support their needs.

Disability: A physical or mental impairment that limits one or more of the major life activities of an individual; a record of such an impairment or being regarded as having such an impairment (Alliance for Technology Access, 2004).

SEA Funding: The Special Equipment Amount (SEA) funding is used by Ontario school boards to assist with the purchase of devices and/or services to support the special education needs of students, based on the recommendation of a qualified professional. Eligible SEA funded items may include computer software, computer hardware, and training that allow students to access curriculum content (Ontario Ministry of Education, 2011).

Individualized Education Plan (IEP): The IEP outlines the assistance provided to students and is developed collaboratively between the school and parents. The IEP details specific accommodations and special education services that a student will receive, based on their identified area(s) of need. The IEP supports the student and the student's parents and teachers in meeting stated learning goals and expectations (Ontario Ministry of Education, 2004).

Learning Disability: The term "learning disability" is defined in several ways by various organizations. While it is outside the scope of this study to include an exhaustive representation of definitions of learning disability, I have adopted the definitions offered by the Government of Ontario and the Learning Disabilities Association of Ontario (LDAO):

- *Accessibility for Ontarians with Disabilities Act*: "A learning disability, or a dysfunction in one or more of the processes involved in understanding or using symbols or spoken language" (Government of Ontario, 2005, section 2).

- Learning Disability Association of Ontario: Learning Disabilities affect the way an individual "takes in, stores, or uses information." Learning Disabilities range in severity and affects individuals in various forms. Learning disabilities are a lifelong condition and its effects vary from person to person (Learning Disability Association of Ontario, 2001).

Research Questions

The key questions guiding this inquiry are:

1)   Is the promise of technology compromised by the visibility of technology support, and how do students who access technology through SEA negotiate any related social dynamic?

2)   What does the diagnosis of a learning disability mean to students and their parents?

3)   What are the particular experiences and contexts within which students who access technology through SEA are trained?

4)   How do teachers, parents, and trainers see their role in the technology assistance program?

To collect data to answer these research questions, the researcher interviewed students, educators, parents, and assistive technology trainers about their experience with technology assistance and their involvement with its implementation. An interview protocol was developed for each group of participant, with the earlier questions focused on their experience with the program. The later questions explored how participants responded to and made sense of technology assistance in school. The interview protocol concluded by asking whether participants felt there was a match between their needs and available technology. In addition to interviews, the researcher informally observed participants in their "natural settings" (Patton, 2002) and recorded her observations in a reflexive journal (Lincoln & Guba, 2000). The resulting field notes from interviews and the reflexive journal were coded and analyzed.

Significance of the Study

This study will contribute to an understanding of the factors that determine the response of students' with invisible special needs such as learning disabilities to technology assistance in schools. Existing research predominantly explores frameworks for the successful adoption of technology tools for students with disabilities (Kintsch & DePaula, 2005; Parette, 1998; Scherer, 2005; Edyburn, 2005). Much research has focused primarily on teachers' knowledge of, attitudes toward, and perceptions about

the use of assistive technology in the classroom (Anderson & Petch-Hogan, 2001; Lahm & Nickels, 1999; Lee & Vega, 2005; Maushak, Kelley, & Blodgett, 2001; Blackhurst, 2005; Wood, Mueller, Willoughby, Specht, & DeYoung, 2005). Blackhurst (2005) also carried out extensive investigation into the types and functions of technology for students with disabilities and their overall effectiveness on student progress. While these are important considerations when examining contemporary issues in assistive technology use, they do not address the intersection of technology and learning disabilities within the context of how students' identities are constructed given the visible nature of technology support. Given the gaps in existing research, the issues involved remain unclear and clarifying research is needed.

This study will contribute to scholarship in several areas, including critical disability studies and special education. Other possible benefits include a stronger understanding of students' perceptions and factors that contribute to their responses to AT. Since research has shown that a high percentage of assistive technology devices are discarded after being in use for a short period of time (Scherer, 2005), a clearer understanding of what contributes to this high rate of under-utilization will help institutions to develop strategies to improve service delivery for students with learning disabilities.

Assistive Technology in Practice

My experiential background in employing assistive technology in support of learners experiencing disabilities opened up many questions for me. I naïvely imagined that an abundance of enthusiasm and expertise in a number of assistive technology

programs would be sufficient to make a significant impact on, if not solve, a large

majority of challenges experienced by students with learning disabilities (LD). I have

learned that being focused on the pragmatics of coaching can easily result in

overlooking the underlying assumption that "people with LD carry a label and an

associated social identity which is a major determinant… of their social relationships"

(Davis & Jenkins, 1997, p. 95). How students labelled as having a LD interpret that

label, whether they perceive it as stigmatizing or try to renegotiate its meaning, became

factors that have far-reaching implications for the outcome of assistive technology

pedagogy. Similarly, understanding how students' interpretation of the LD label shifts as

they progress from elementary to secondary school has become a significant factor in

the coaching process.

My observation as an assistive technology coach suggests that student

enthusiasm for having special equipment decreases as students progress through the

school system. At the elementary school level (K-5), I found students to be very

enthusiastic. At the elementary level, students who are provided with a laptop computer,

scanner, and printer under SEA funding are the envy of the classroom. These students

are the "cool kids" in the classroom and school. Their peers often inquire if and when

they would be receiving similar equipment. Some even suggest that it is unfair that they

do not also have a computer at school.

At the middle school level (Grades 6-8), I observed student responses to be

mixed as several factors become more evident, such as specific grade level, students'

ethnicity, location of the equipment, and students' frustration with their inability to

perform at the same level as their peers. Classmates' responses are less enthusiastic

compared to those in earlier grades, but their curiosity regarding why and how these students have their "own equipment and a trainer" is the same as that experienced in elementary schools. SEA recipients' responses to technology assistance within this environment are noticeably different, as students appear more preoccupied with their peers' assumptions and perceptions about their academic abilities/competence.

At the secondary level (grades 9-12), I encountered an entirely different dynamic than that experienced in elementary and middle schools. My early optimism that "computer technology would minimize the negative impact of students' disabilities and maximize their learning strengths" (Anderson-Inman, 1999, p. 240) was seriously challenged. With the exception of a few desktop computers, secondary level students receive a laptop computer primarily because of portability when several classes are held in multiple locations. Based on my experience in earlier grades, I approached my coaching sessions thinking how cool it is to have a laptop computer in high school. To my surprise, I found that in many instances students either are absent or flatly refuse to participate in training. In instances where students show up, they are often flustered and concerned about the venue and duration of the session. If the training takes place in the presence of their "normally achieving peers" (Zeleke, 2004), the student is quick to assure me that "I really don't need or use my computer, and in any case I already know how to use the computer" (sample student comment). As at the elementary and middle school levels, the persisting questions from their peers are "How come you have a computer?" and "Why does she need to show you what to do?" I also noticed that the "cool kids" response had entirely disappeared, and a critical element had entered the student-to-student relationship. What does it mean to secondary school students to

have a LD diagnosis? What does the presence of a laptop and a trainer mean to them at this level?

I have come to realize that there is more to technology assistance than imparting my expertise in assistive technology. There are clearly multiple intersecting forces that impact students' response to having technology assistance in schools. My role potentially provides another layer of complication that students with learning disabilities have to negotiate daily. Is the promise of technology compromised by the visibility of the support? Are students' responses reflective of a feeling that technology is parallel to a wheelchair, with the added risk of being considered lazy or academically inferior? Such questions underlie the proposed research study.

Chapter 2: Theoretical Framework

The available research did not help me to answer the many questions raised by my experience as an AT coach. In order to explore these questions, I combined a number of theoretical concepts to make sense of the complex experience of students who access technology through SEA. Background literature related to the intersection of technology and learning disabilities is examined in this chapter to provide grounding to the research questions being investigated in this study. In exploring the experience of these students, a review of the two dominant approaches to disability from a critical disability perspective is fundamental to understanding the complex nature of negotiating a disability identity. One approach is based on a physical or medical understanding of disability while the other is based on socio-cultural understandings. Identity management and impression management theories also contribute to an understanding of the context and experience of SEA students as they negotiate social labelling in their use of assistive technology.

The first section of this chapter presents an overview of social constructionism, the social and medical models of disability that help explain the creation of disabled identities in contemporary culture, and identity management theory. The literature review is organized into four sections. The first section focuses on parents' and students' understandings of the diagnosis of a learning disability. The second section examines the attitudes of core stakeholders (parents, students, and teachers) toward technology. A third section examines identity and self-concept issues associated with technology assistance. In the final section, the studies reviewed describe experiences of

students using AT and how these experiences impact their response to technology assistance. This section is essential because very few studies directly examine tensions between the LD label and personal empowerment through technology assistance.

Social Constructionism

According to Burr (2003), social constructionism is a theoretical framework that stems from an epistemological position instead of an explanatory theory, and is primarily focused on meaning and power. Burr also suggests that the core underlying assumption of social constructionism is that objects are controlled by social and cultural factors rather than natural factors. Gergen (1999) also states that a social constructionist perspective recognizes that language and culture are central to the creation of meaning, leading to the creation of reality. This perspective offers several ways of understanding several authors' (Shakespeare, 1996; Oliver, 1996) positions that disability is the outcome of social factors and practices, and is best seen as a socially constructed phenomenon. A more detailed discussion of the two models of disability that have been widely used and accepted in contemporary culture is covered in this literature review.

Medical Model of Disability

The traditional medical model of disability views disability as a disease or personal deficit and locates the problem of disability within the individual (Oliver, 1996). The following assumptions underlie the medical model of disability:

- An individual is disabled due to their individual impairments and therefore requires medical interventions to acquire the skills needed to adapt to society (Oliver, 1996).

- Individuals with disabilities are considered sick and incapable of meeting normal obligations, resulting in them being isolated and alienated from society.

- Disability is not considered to be a product of the relationship between individuals with impairments and a disabling society (Shakespeare, 1996).

- Impairment-specific labels are imposed by medical professionals rather than chosen by individuals with disabilities (Barnes, 1996; Oliver & Barnes, 1998).

- Persons with disabilities are viewed as inadequate, dependent, and in need of care (Oliver, 1990).

Braithwaite and Thompson (2000) suggest that the medical model of disability forms the basis of many cultural conflicts in the experience of people with disabilities because it denounces them as defective and abnormal. Linton (1998) similarly asserts,

> The medicalization of disability casts human variation
> as deviance from the norm, as pathological condition,
> as deficit, and, significantly, as… personal tragedy.
> Society, in agreeing to assign medical meaning to
> disability, colludes to keep the issue within the purview
> of the medical establishment. (Linton, 1998, p. 11)

According to Shakespeare (1996), the medical model emphasizes physical difference and categorizes persons with disabilities as "that group of people whose bodies do not work… or who cannot do productive work." Shakespeare further suggests that this approach raises questions of normality since it is built on the assumption that there is a certain standard from which persons with disabilities differ.

Within the context of this study, the medical model approach offers insight into the negative identities internalized by students accessing SEA funded technology and their subsequent lack of engagement with AT. Several studies suggest that compared to their peers without LD, students with LD report having negative self-perceptions (Bear, Minke, & Manning, 2002; Elbaum & Vaughn, 2003; Heath & Wiener, 1996; Stone & May, 2002; Wiener, 2004). A large number of earlier studies similarly concur that since students with LD experience academic failure, their self-image is usually at risk (Bloom, 1976; Bryan & Pearl, 1979; McWhirter, McWhirter, & McWhirter, 1985; Serafica & Harway, 1979).

One example of the medical model of disability evident in the experience of students with LD is the delivery of specialist AT intervention to SEA students in non-inclusive settings. For example, positioning SEA students and their equipment at the rear of classrooms or in a resource room reinforces the notion of disability as an individual pathology (Rioux, 1999). A second example of a medical model approach in the educational experience of students with an identified LD is a normalizing of inappropriate comments by non-disabled peers toward them. This reflects the attitudinal barriers and stigma that SEA students face in accessing support. Within the context of

this study, a medical model approach is evident in participants' descriptions of and responses to the LD label.

Social Model of Disability

The social model of disability was developed by the Union of the Physically Impaired Against Segregation (UPIAS) in the mid-70's as an alternative to the medical model of disability in understanding the experiences of individuals with disabilities. The social model makes a clear distinction between impairment and disability, and views disability as socially constructed (Oliver, 1996). In other words, individuals are not disabled by their impairments but by the environmental, economical, and cultural barriers that exist in society and which do not take into account their needs. For example, a wheelchair user is disabled when a building does not have ramp access or push buttons; a blind or low-vision student is disabled if an educational institution does not provide learning materials in alternative formats or have magnification options for viewing text.

The following principles are central to the social model of disability (Barnes, 2012):

- The social model recognizes the importance of appropriate educational, medical, rehabilitative, and employment-related interventions while recognizing inherent limitations in their ability to empower persons with disabilities.

- The social model reflects a shift from focusing on impairments to people's experience with environmental and cultural barriers that prevent them from being included in society.

- The social model provides a lens through which disabling tendencies can be viewed and a vehicle for the creation of practices and policies to eradicate societal barriers.

The social model of disability can best be described as a re-conceptualization of the relationship between individuals with disabilities and the disabling barriers that exist in society. In other words, the social model of disability views impairment as the loss or lack of some functioning part of the body and views disability as the meaning society attaches to the presence of impairment (Oliver, 1996). Oliver also posits that the social model of disability places emphasis on individual and collective responsibility in challenging disablement and promoting awareness of inclusive practices and culture.

The social model of disability relies heavily on a "social constructionist" perspective that is primarily predicated on meaning and the significance of learning from the experience of persons with disabilities to understand meanings of disability (Oliver, 1996). Higgins, Raskind, Goldberg, and Herman (2002) state that the social construction of disability as "master status" has resulted in the label of disability spreading from single-task to global challenges.

The social model of disability is the dominant paradigm for understanding disability in recognizing that people have physical, sensory, cognitive or psychological differences that dictate how they function in society (Barnes, 2012). Examples of a

social model approach for students with learning disabilities are reflected in teachers'

attempts to proactively respond to diverse learning styles. For example, using diagrams

or visual aids instead of teaching in a linear style provides more learning opportunities

for a visual learner. Another example of a social model approach is the provision of

laptops and AT as a form of accommodation.

Identity Management Theory

Like social constructionism and the social and medical models of disability,

Cupach and Imahori's (1993) Identity Management Theory (IMT) provides a valuable

theoretical framework for understanding SEA students' responses to AT as they

negotiate personal identities and manage the stigma that accompanies the diagnosis of

LD as an invisible disability.

Identity Management Theory draws directly on other identity-based theories such

as Identity Negotiation Theory (Ting-Toomey, 1993, 2005) and Cultural Identity Theory

(Collier, 1998; Collier & Thomas, 1988; Collier, 2005). Cupach and Imahori contend that

"communication competence requires the ability of individuals to successfully negotiate

mutually acceptable identities in interaction" (p. 118). The theory explains how cultural

identities are negotiated through development of an interpersonal relationship. Although

IMT is concerned with people's cultural identities, the theory is not limited to intercultural

relationships but instead recognizes that cultural identities are present in all types of

relationships. IMT can be applied to various types of cultures including ethnicity, region,

disabled and non-disabled, and socioeconomic class.

Cupach and Imahori highlight several key concepts in IMT including competence, identity, cultural and relational identities, face, and facework. Abbreviated definitions of each concept are presented as follows because of their relevance to the experience of study participants.

Competence: Cupach and Imahori suggest that competence is defined by the dominant culture, and further suggest that in any intercultural relationship appropriate and effective behaviour must be mutually satisfying to both parties.

Identity: Cupach and Imahori define identity as "a self-conception, one's theory about oneself" (p. 224). The authors suggest that identity is best understood as a framework enabling an individual's understanding of self and the world. In explaining the complex construct of identity, the authors posit that identity is made up of several overlapping sub-identities such as nationality, ethnicity, occupation, sex, (dis)ability, and age/generation. Identity is formed in several ways such as self-categorization into social groups and identification with various social roles including student, teacher, husband, wife, etc.

Cultural Identity: Cupach and Imahori define cultural identity as one's identification with and acceptance of relationships with a group having shared systems of symbols and meanings, norms, and rules for conduct. Cultural identity includes all facets of identities concerning social and cultural groups.

Relational Identity: Relational identity refers to self as defined in relation to specific inter-relationships. According to Cupach and Imahori, relational identity arises out of "a privately transacted system of understandings" that helps people negotiate

meanings and behaviours. Unlike cultural identity, relational identity is limited to the relationship between individuals, such as husband and wife or parent and child.

Face and Facework: Goffman (1967) describes "face" as the positive social value that individuals claim for themselves. Goffman similarly proposes that "facework" refers to one's actions to save or maintain face. Goffman further suggests that there are two kinds of facework: offensive and defensive. "Offensive facework" refers to the actions taken by individuals to make their actions consistent with the face they present or the image they wish others to have of them. Goffman similarly proposes that "defensive facework" can be described as the actions taken by individuals to avert possible humiliating situations.

Impression Management

Central to the discussion of identity management is the concept of Impression Management (IM) or self-presentation theory (Goffman, 1959). To illustrate this concept, Goffman likens everyday life to a theater in which individual actors (people) create, maintain, defend, and control others' reactions to and impressions of them through assumptions, settings, props, and scripts. Other contributors to the theory of impression management suggest that in addition to attempting to influence or manipulate the images others hold of them (Tedeschi & Reiss, 1981), people are motivated by social rewards and consequences, enhanced self-esteem, and constructing and maintaining a desirable self-concept (Leary & Kowalski, 1990).

Identity management theory was adopted for this study because of its usefulness in advancing an understanding of how students with invisible disabilities such as a

learning disability negotiate personal identities when technology and disabilities intersect. Furthermore, this concept was key in understanding how students who have been diagnosed as having a LD employ impression management techniques, striving to distance themselves from any service that is incompatible with the identities and images that they would like their able-bodied peers to have of them. Identity Management Theory provides a useful lens for understanding and interpreting the responses of students who access technology through SEA and opens up possibilities for future models of service delivery. For the purpose of this study, I chose to examine the concepts of invisible disabilities and stigma as the basis for understanding SEA students' interpretation of and response to assistive technology.

Matthews and Harrington (2000) view invisible disability as "one that is hidden so as not to be immediately noticed by an observer except under unusual circumstances or by disclosure from the disabled person or other outside source" (p. 405). The authors further suggest that it is important to understand the consequences of the visibility factor on the attitudes and behaviour of persons living with an invisible disability. Within the context of school, is it conceivable that the visible nature of technology assistance in the form of computer equipment and a trainer poses particular problems for some students with learning disabilities who have been able to "pass" as "normal?" Could this situation be forcing these students to negotiate their identities in ways that do not cause them to stand out as different?

Central to the experience of persons with invisible disabilities is the idea of stigma (Goffman, 1963) and shame (Lazare, 1987). Goffman examines stigma under four distinct categories depending on whether it is visible, known about, obtrusive or

relevant (p. 410). Goffman describes a visible stigma as one that is conspicuous or obvious and an invisible stigma as one that is not readily apparent or noticeable. It is the latter idea of invisible stigma that has been a focus of my research since students with LD have an invisible disability. Goffman proposed that the notion of visibility plays a major role in a person with a disability's response to stigma based on the idea of being either discredited or discreditable persons. He defines a discredited person as one who believes that their disability is visible to others and that he/she must manage the anxiety of this knowledge being made public. On the other hand, the discreditable person believes that the disability is invisible and he/she must manage the anxiety of keeping the information hidden. The discreditable person has the additional challenge of using the information management strategy of "passing" or deliberately concealing the disability (Matthews & Harrington, 2000; Goodrich & Ramsay, 2013).

The presence of technology assistance in the form of equipment and training may represent a source of anxiety for students who not only have to deal with the stress of an "outsider" knowing about the diagnosis of LD, but must also negotiate the risk of their peers finding out about their learning differences. Lazare (1987) theorizes that shame is related to the fear of being negatively evaluated by others. As previously noted, perceptions of the role of paraprofessionals in the classroom, compounds the challenges experienced by students receiving technology assistance. In my role as an AT trainer, I observe that paraprofessionals oftentimes accompany students to AT training sessions. Under these circumstances, it is conceivable that the stigma faced by these students becomes two-fold. First, students with disabilities already feel stigmatized because they receive dedicated paraprofessional support (Giangreco,

2003). Second, the student must also contend with the visible nature of physical technology support. My observations open up the possibility that technology training sessions unwittingly create a "shame inducing event" and expose students as defective; a belief that goes against students desired portrayal of their ideal self of being considered "cool." Minimizing shame is particularly complicated for secondary level students who are undergoing a developmental phase in which competition and social comparisons as well as a strong sense of self-awareness are at a very high level (Eccles, Midgley, Wigfiled, Miller-Buchanan, Reuman & Flanagan, 1993)

Literature Review: Parent and Student Understanding of the Diagnosis of a Learning Disability

The term "Learning Disability" (LD) has been characterized and interpreted differently by various professionals. Higgins, Raskind, Goldberg, and Herman (2002) suggest that the multiplicity of differing opinions and conflicting explanations offered by professionals surrounding the definition of LD contributes to misperception and misunderstanding among families, educators, and students. A review of various definitions of LD reveals stark inconsistencies in the designations of LD across provinces and among school boards within the same province (Harrison & Holmes, 2012). The invisible nature of LD coupled with a lack of consistency in definition, assessment, and diagnosis (Harrison & Holmes, 2012; Osterholm, Nash, & Kritsonis, 2007) further compounds confusion and misconstructions among students with LD and their parents. As a starting point for understanding the perspectives of parents and students with learning disabilities, it is important to determine what students with LD and

their key support persons (parents, peers, and teachers) know about LD and how they make sense of this diagnosis.

In Ontario schools, students receiving special education programs or services must be provided with an Individualized Education Plan (IEP). This plan is developed collaboratively by teachers, parents, and specialists and provides a description of the identified areas of need, reasons for specialized programming, and a plan for achieving students' educational goals (Ontario Ministry of Education, 2004). Although an IEP provides evidence of students' challenges along with recommendations for addressing these needs, it is not uncommon for students to be oblivious to the reasons they have an IEP or receive special education assistance (Abernathy & Taylor, 2009; Campbell-Whatley, 2008). Several authors have determined that students are often ignorant about educational decisions made on their behalf (Albinger, 1995; Abernathy & Taylor, 2009) and, in particular, the meaning and implications of various identification or labels specified in their IEP. For instance, in a mixed-method survey examining teachers' perceptions of students' knowledge and understanding of their LD diagnosis, Abernathy and Taylor (2009) noted that regrettably, students with disabilities were unsure and/or unaware of their disabilities and the overall impact on their lives. The researchers further suggest that although parents, teachers, and community advocates assume advocacy responsibilities for younger students with disabilities, as these students mature they are expected to assume self-advocacy responsibilities. This is easier said than done in instances where students are not only ignorant of the characteristics of their disability but are unaware of the presence of a disability (Campbell-Whatley, 2006). Other researchers (Lightner, Kipps-Vaughan, Schulte, & Trice, 2012) suggest that even

in post-secondary contexts, students with LD report not knowing enough about their LD in high school, the characteristics of their LD, and its impact on classroom behaviours.

In a study of parents' expectations of adolescents with disabilities, Doren, Gau, and Lindstrom (2012) determined that parental expectations had a significant impact on the autonomy and outcomes of adolescents with disabilities. The researchers suggest that parental behaviours are internalized by adolescents and ultimately impact their values, beliefs, attitudes, and behaviours.

Beart (2005) posits that "people with learning disabilities are defined as such by others because they differ from a culturally defined idea of 'normal' intellectual functioning" (p. 128). Albinger (1995) also suggests that children are tested and labelled as having a LD once they do not meet teachers' and/or parents' expectations. The author further suggests that labeling a child as LD situates the problem squarely on the child, with very little consideration of their feelings about what it means to assume this label. Other researchers have similarly found that the definition of LD is largely embodied, is in the control of professionals, and is generally not a sought-after identity (Gillman, Heyman, & Swain, 2000; Davies, 1998). Moreover, a significant amount of research shows that families and professionals perceive and understand invisible disabilities such as learning disabilities differently (Harry, Rueda, & Kalyanpur, 1999; Linan-Thompson & Jean, 1997; Shapiro, Monzo, & Rueda, 2004).

In a meta-analysis of 34 studies published between 1970 and 2000 addressing the effects of labeling students as LD, Osterholm, Nash, and Kritsonis (2007) determined that the LD label has negative repercussions for labelled students. Some

notable consequences include teacher insensitivity toward students and lowered expectations and negative stereotypes. Of particular note in this study is the correlation between lowered expectations and reduced effort and achievement among students with the LD label. The researchers suggest that people with LD interpret labeling as stigmatizing, leading to feelings of isolation and exclusion (Sutcliffe & Simmons, 1993) that impact their global school experience. Students in the study describe pull-out programs as especially painful, since they experience separation from their non-disabled peers in a way that is often visible and stigmatizing. Gillman et al. (2000) similarly assert that "many labels signify memberships of groups devalued by society and impose a stigmatized identity on the individual" (p. 395).

Campbell-Whatley (2008), in a pilot study of 13 elementary, middle, and high school students with learning disabilities, found that students with LD often interact with individuals who do not understand what it means to have a LD. Campbell-Whatley further suggests that while students, teachers, and parents have an understanding of physical-related disabilities, they have very little understanding of the needs of individuals with a LD. Osterholm, Nash, and Kritsonis (2007) similarly suggest that the lack of physical symptoms for students with LD lends itself to others assuming that students lack motivation and commitment. In the same spirit, Campbell-Whatley asserts that on one hand, students have a limited understanding of their special education placement and incorrectly assume that their academic failures are a result of lack of motivation, sometimes believing that they may not be trying hard enough or that they are just lazy. On the other hand, a large number of general education teachers and parents view students as unmotivated, and perceive academic challenges as resulting

from idle behaviour rather than a LD (Campbell-Whatley, 2004). Still other researchers affirm teachers and parents' tendency to connect students' success or failure to level of effort invested (Lackaye & Margalit, 2006).

Higgins, Raskind, Goldberg, and Herman (2002) conducted a 20-year longitudinal study to understand and describe the lifespan experiences of 41 students with LD. The study focused on the participants' experience of coming to terms with the technical realities of LD and the social and emotional consequences of the diagnosis of LD. Higgins et al. determined that students undergo several life stages including (a) a period of awareness of "differentness," (b) the labeling event, (c) understanding the limiting nature of their disability and negotiating with service providers, (d) compartmentalization of LD, and (e) attitudinal transformation toward their LD.

All participants recalled an awareness of being different in academic and non-academic areas. Participants also refer to a process whereby professionals and parents attempted to figure out what was "wrong" with them. Some participants felt they were labelled correctly while others felt they were mislabelled. Most participants expressed that they experienced emotional responses to being labelled including fear, anger, confusion, and frustration.

Participants described periods in which they attempted to understand and negotiate the LD label within the context of their abilities and the available support/services to address areas of need. Parents and students indicated that their goal was to balance social stigma while maximizing access to support. Participants describe going through a phase of minimizing weaknesses and maximizing strengths

while containing their disability to the classroom. The authors describe the final phase of acceptance as a transformative phase in which students accepted their disability as something positive in their lives.

In another study, Canary (2008) drew upon data collected in a qualitative study of 4 families of children with invisible disabilities in special education classes from 4 public elementary schools. The goal of the study was to determine how individuals constructed notions of ability and disability in their families. Participants included parents, siblings, and extended family members from diverse ethnic backgrounds. Canary reported that families construct identities of "normal" based on everyday routines and interactions. Also, parents of children with disabilities are able to observe them in multiple contexts and view their weaknesses and strengths beyond diagnostic testing. Canary further suggests that although these families found their children's disabilities perplexing, labels did not help to solve their confusion and instead were perceived as jargon reserved for professionals, formal paperwork, and IEP meetings. Several parents in the study describe the nature of their children's disabilities as frustrating and difficult to understand. These adults further explain that they have difficulty articulating issues related to their children's disability since they resort to keeping discussions in private. Canary (2008) asserts that parents in the study liken the complexity of their children's disability to a puzzle that they are unable to solve, since labels and specific diagnoses do not appear to be important to families as they focus on their children's strengths and weaknesses. Some of Canary's participants report that explanations from professionals in plain language are often helpful in understanding causes and solutions related to their

children's disabilities. The invisible nature of the children's disabilities adds another layer of complexity in families' responses and understandings of disabilities.

Literature Review: Attitudes of Core Stakeholders toward Technology

Research overwhelmingly stresses the value of collaboration between educators, families, and students as key stakeholders in the assistive technology process (Parette & Angelo, 1996; Parette, Brotherson, Hourcade, & Bradley, 1996; Parette & McMahan, 2002)**.** In determining the level of commitment of various stakeholders toward AT, there is need for decision-makers to establish an overall attitude toward technology in order to pre-empt and mitigate potential barriers and resistance to AT.

Family Involvement

In examining family involvement and responses to AT, it is important to gain insight into the broader issues related to how families negotiate disability and, in particular, invisible disabilities. Several authors (Canary, 2008; Braithwaite & Thompson, 2008; Matthews & Harrington, 2008) assert the importance of examining the multiple perspectives and experiences of various family members of individuals with disabilities. Canary (2008) suggests that compared to professionals, parents are able to observe their children in multiple contexts and therefore have different understandings of their abilities/disabilities. It is therefore conceivable that these particular relationships and interactions in various settings augment the need for family involvement in decisions related to all aspects of their children's education, including AT implementation. Several authors (Cox & Harter, 2003; Hussain, 2005; Shapiro, Monzo, & Rueda, 2004) concur that culture, ethnicity, and socioeconomic status are factors that

influence the goals and expectations of families of children with disabilities. Other authors similarly posit that socioeconomic status and culture have implications for reactions to technology (Heur, Parette, & Scherer, 2004) and access to technology (Bray, Brown, & Green, 2004).

Some families become involved with the technology assistance process in schools by advocating for their children, in the hope that identification will open doors to available resources and social support (Gillman, Heyman, & Swain, 2000). Edyburn (2005) similarly suggests that students who access AT tend to have strong parental advocates. Other families become aware of technology assistance provision for their children through the IEP process. The dynamic of how families become involved with AT decisions is an important factor in understanding their response to technology assistance for a child with a LD.

Many theorists make a case for the involvement of families in AT decisions, arguing that effective decision-making regarding technology should comprise a team approach involving collaboration between professionals, students with disabilities, and their families (Parette & Angelo, 1996; Parette, Brotherson, Hourcade, & Bradley, 1996; Parette & McMahan, 2002; Jeffs, Behrmann, & Bannan-Ritland, 2006). Bearing in mind that a large number of SEA computers are used in home environments, there is a real need for families to understand their role and the reasons for AT. Parette (1998) also suggests that the onus is on professionals to determine family members' willingness and ability to use computers with their children at home.

In a study of parents and students perspectives on AT, Young (2013) interviewed 12 graduates of a provincial demonstration school and their parents. This setting was of particular importance because students with LD are provided with intensive training on AT at this school. Young (2013) reported that students and parents perceived AT to have a positive impact on students' learning. Parents and students specifically identified enhancements in several areas, including persistence with tasks, demonstration of academic capability, confidence, motivation, and improved writing.

While outside the scope of this study, several studies have determined that it is important for professionals to carefully consider how families' cultural values affect their willingness to participate in the process of considering AT for their child (Hourcade, Parette, & Huer, 1997; Huer & Wyatt, 1999; Kemp & Parette, 2000; Parette & Petch-Hogan, 2000; Parette & Anderson, 2001). According to Smith-Lewis (1992), African-American family members often opted not to use AT devices that drew attention to their children. Several authors similarly assert that many African-American families value fitting into a community, as opposed to being recognised as different from others (Parette, 1998; Roseberry-McKibbin, 1995; Willis, 1992). It would be helpful to determine how socio-cultural perspectives of disabilities factor into these families' responses to AT.

Another important consideration for family involvement in assistive technology decision-making is the family's perceived need for AT in their child's education. In fact, not all family members respond positively to educationally necessary technology, especially when it affects family routines and introduces additional stressors such as repeated training sessions (Hourcade et al., 1997). Other implications for family

involvement relate to the potential of abandonment or under-utilization of assistive technology, as research has shown that a high percentage of assistive technology devices are discarded after being in use for a short period of time (Scherer, 2005).

Philips and Zhao (1993) suggest that student/user opinion in the assistive technology provision process is important in the level of acceptance and subsequent use of technology. It has been found that there is strong correlation between students' out-of-school experience with computers and their information technology experience in school (Mumtaz, 2001). Attwell and Battle (1998) similarly determined that ethnic minorities and students from lower socioeconomic status (SES) benefited less from computer use because of less parental involvement and awareness of the value of engaging in learning with their children. Additionally, families from low socioeconomic backgrounds often have pressing concerns about basic needs such as food, work, and transportation that make it difficult for them to participate in assistive technology evaluation and training sessions (Kemp & Parette, 2000). The priorities of these families may be very different than those of the professionals working with their child. Jeffs, Behrmann, and Bannan-Ritland (2006) noted that users and parental input in AT decision-making can be useful to educators, professionals, and researchers in making more informed choices. In another study on parental involvement in home computer use, GiacQuinta, Baucer, and Levin (1993) found that students considered educational software boring. The study also showed students who used computers for educational purposes did so with hands-on parental involvement.

These research findings provide possible explanations for the level of parental involvement and commitment to the SEA claim process, given that parents who are

aware of the benefits of technology for educational purposes proactively advocate for this form of accommodation for their children. At the same time, cultural differences and time constraints may preclude the involvement of other families.

In a study of the issues affecting the efficacy of computer-based solutions for students with learning disabilities, Anderson-Inman (1999) posits that student motivation to succeed in school is an important variable affecting how students with learning disabilities respond to technology assistance. Anderson-Inman also established that, although the computer is motivating to many students, sustained interest in technological intervention is not always possible because not every student is motivated to succeed in school. The researcher also discovered that students who use technology for personal activities (gaming, surfing the web) rather than school-related activities are less likely to benefit from the accommodation. Donovan, Green, and Hartley (2010) similarly suggest that acquisition of laptops and technological devices does not guarantee engagement and academic success, since some students find these devices to be distracting.

Teacher Involvement

Research studies have long established that teachers play a fundamental role in the implementation of technology use in the classroom (Brosnan, 1998; Conlon & Simpson, 2003; Cuban, Kirkpatrick, & Peck, 2001; Mercer & Fischer, 1992; Schoefield, 1997). In an attempt to understand the slow implementation and limited use of technology in schools, Zhao and Frank (2003) analyzed the data of technology uses in 19 schools. These authors reported that unless teachers have a positive attitude toward

technology, it is unlikely that they will encourage its use. They also found that teachers' responses to technology are affected by their degree of (un)certainty about the value of technology in their practice.

Much research has focused on teachers' attitudes and/or knowledge toward AT (Anderson & Petch-Hogan, 2001; Lahm & Nickels, 1999; Lee & Vega, 2005; Maushak, Kelley, & Blodgett, 2001). The common finding among these researchers is that positive teacher attitudes toward technology increase with more knowledge as teachers become less apprehensive about their lack of expertise in this area. Other factors affecting commitment on the part of educators include lack of time to learn the software programs, set up the equipment, and plan to incorporate AT in classroom activities (Conlon & Simpson, 2003; Cuban, Kirkpatrick, & Peck, 2001; Lee & Vega, 2005). Burne, Knafelc, Melonis, and Heyn (2011) also suggest that funding should be allocated for teachers to be trained to become competent in facilitating AT use in classrooms.

Poel, Wood, and Schmidt (2013) conducted a research study with preservice teachers to determine prior knowledge of AT, provided exposure to AT in the form of a training module as part of the study, and investigated the resulting impact of AT exposure on teachers' classroom practice. The researchers report that study participants (preservice teachers) admitted to feeling more confident, knowledgeable about AT concepts, and better prepared to support students with AT .

Many studies investigating teachers' perceptions of special accommodations for students with LD have shown that although teachers see value in specialized accommodation, they do not see the implementation as feasible within the context of

their classroom demands (Gersten & Woodward, 1990; Vaughn, Reiss, Rothlein, & Hughes, 1999). Certain classroom teachers find it difficult to implement solutions because other students perceive the accommodations as unfair (Vaughn, Schumm, Klinger, & Saumell, 1995). There is also research examining teacher perceptions of technology within the context of barriers and supports (Staub & Stern, 2002; Wood, Mueller, Willoughby, Specht, & DeYoung, 2005). These studies show that teachers' knowledge, skill, and teaching philosophy are contributing factors in how they implement technology use in their classrooms (Staub & Stern, 2002). "Technophobia" or computer anxiety has also been identified as a reason why teachers might be reluctant to support computer use (Rosen & Weil, 1995). According to Okolo and Diedrich (2014), teachers also identify lack of knowledge and support in integrating AT into curriculum as barriers to implementation.

Universal Design for Learning

Having established the critical role that educators play in advancing AT use in classrooms, it is important to consider practices that prevent barriers and enhance inclusive environments. One such practice is the Universal Design for Learning (UDL) framework. Although an exhaustive exploration of UDL is outside the scope of this study, it is worthwhile to recognize and examine the role and implications of UDL in advancing inclusive pedagogy.

According to Edyburn (2010) the principles of Universal Design for Learning (UDL) were developed in 1997 amidst widespread concerns about inclusion of students with disabilities in general education classrooms with the goal of addressing other

educational needs of students beyond physical access to the classroom. UDL

principles followed the re-authorization of the Individuals with Disabilities Education Act

(IDEA) and is largely accredited to the work of David Rose and Anne Meyer.

Edyburn (2010) posits that UDL refers to a scientifically valid framework for

informing educational practices on several levels: Firstly, UDL provides flexibility in the

presentation of information, ways in which students respond or exhibit knowledge and

abilities, and how students demonstrate engagement. Secondly, UDL reduces

instructional barriers, provides appropriate accommodations, and maintains high

achievement expectations for all students. Rose and Meyer (2002) similarly determined

that educators have a responsibility to find innovative ways to proactively make

curriculum accessible to individuals with varying backgrounds, abilities/disabilities, and

learning styles in different contexts and situations.

Rose and Gavel (2010) suggest that the recognition, strategic, and affective

networks form the basis of effective instructional planning for diverse learners and these

3 networks underlie the following 3 core principles of UDL (Hall, Meyer and Rose,

2012):

- Multiple means of representation (recognition network) to support how
  learners perceive and make meaning of information.

- Multiple means of action and expression (strategic network) to support
  how learners organize and express their ideas.

- Multiple means of engagement (affective network) to support how learners become engaged, stay motivated, and maintain effort and persistence.

Given the complexity of the classroom dynamic in the implementation of AT, UDL principles provides a framework for facilitating flexible access to learning materials in multiple formats and presentation of curriculum beyond traditional means.

It is important to note that despite its promise, several authors recognize and caution that the promise of UDL should not be overstated in academic settings. For example, McGuire, Scott, and Shaw (2006) suggest that there are limits to effective use of certain types of technology in certain settings for some learners. Consistent with the literature related to challenges with AT implementation in classrooms (Conlon & Simpson, 2003; Cuban, Kirkpatrick, & Peck, 2001; Lee & Vega, 2005), McKenna and Walpole (2007) similarly suggest that teachers and special educators have limited time, training, and funding to effectively support students.

Paraprofessional Support

One key element that gets overlooked in the implementation of assistive technology is the role that paraprofessionals or classroom assistants play in special education classes. According to Giangreco, Edelman, Broer, and Doyle (2001), the increasing number of students with disabilities being educated in general education classrooms has led to a rise in the number of paraprofessionals accompanying these students in general education classes. Giangreco et al. also point out that a dearth of qualified special educators, coupled with adverse working conditions such as excessive paperwork and insurmountable caseloads, have contributed to the growing number of

paraprofessionals in the classroom. In a review of a decade of literature on the roles of paraprofessionals, the authors noted that despite being less qualified than special educators, paraprofessionals are assigned to work with students with the most challenging behaviours and academic needs.

Other researchers similarly note that paraprofessionals are increasingly relied upon to undertake roles for which they are either untrained or insufficiently trained (Blalock, 1991; Fletcher-Campbell, 1992; French & Pickett, 1997). Some of the roles assumed by paraprofessionals include instruction in academic subjects, personal care, behaviour management, and instruction in everyday life skills. Although paraprofessionals provide students with disabilities a particular level of support and attention, there are inadvertent consequences. On one hand, teachers rely on and perceive paraprofessionals to be responsible for the instructional and special needs of students. On the other hand, students with disabilities become stigmatized because of the presence of a paraprofessional (Giangreco, 2003).

While an extensive study of paraprofessional support for students with disabilities is outside the scope of this study, paraprofessionals play a key role in the implementation of AT in schools, since teachers oftentimes rely on them to attend AT training sessions with students and provide guidance on when and how to use prescribed software in the classroom.

Literature Review: Identity and Self-Concept Issues with Technology Assistance

A review of literature on self-concept reveals numerous definitions, multiple theoretical perspectives, and several instruments used to measure self-concept. By the

same token, research on self-concept reveals that several terms related to an individual's feelings about themselves are used interchangeably. These include "self-esteem," "self-worth," "self-perception," and "academic self-concept" within the school context. Although inconsistent and at times contradictory, research on these terms related to students with disabilities is relevant to this study since the findings offer possible insights into students' responses to being labelled LD and to AT subsequently.

Bracken (1996) suggests that self-concept refers to a person's feelings and thoughts about themselves as it relates to a specific task or activity. Lawrence (1996) similarly defines self-concept as an individual's awareness of his/her own identity and outlines three aspects of self-concept: self-image (what the person is), the ideal self (what the person wants to be), and self-esteem (the difference between what the person wants to be and what he/she is). In Lawrence's definition, self-esteem is viewed as one dimension of self-concept. Harter (1990) defines self-esteem as an individual's global assessment of himself/herself. According to Shavelson, Hubner, and Stanton (1976), self-concept is "an outcome of an individual's experience with the environment and one's appraisal of these experiences" (p. 113).

Bear, Minke, and Manning (2002) analyzed 61 studies to determine differences in self-concept for students with LD compared to those without. Bear et al. concluded that marginal differences existed in students with LD social behavioural and global self-worth. Other findings suggested that students with LD had more negative self-perception than normally achieving peers with respect to academic performance. Bear et al. also determined that gender, grade level, and classroom setting did not impact self-perception or overall global self-concept.

Chapman (1988) reviewed 21 studies to determine the differences in self-concepts of students with and without LD, and concluded that students with LD had lower self-concepts compared to their non-disabled peers. Chapman also found that students with LD receiving remedial assistance in special educations settings had higher self-concepts than those not receiving specialized assistance.

Elbaum (2002) examined 38 studies of students with LD in various educational settings (regular classroom versus resource room or self-contained classroom). Elbaum's analysis concluded that there was no logical relationship between self-concept and educational placement of students with LD.

A number of researchers agree that a student's self-concept at school or academic self-concept is affected by the image that key support persons have of them (Bear, Minke, & Manning, 2002; Elbaum, 2002; Schmidt & Cagran, 2008), in addition to their social comparison with peers in the same environment (Möller, Streblow, & Pohlmann, 2009). Möller et al. further suggest that the learning difficulties experienced by students with LD have an adverse impact on their academic self-concept. Several studies have shown that the self-concept of students with LD is lower than that of their peers without learning disabilities (Chapman, 1988; Crabtree & Rutland, 2001). Harris (1995) asserts that self-esteem, an important part of our self-concept, is associated with personal satisfaction and effective functioning. Harris further posits that ideals and aspirations are of importance in developing self-concept.

A common finding among researchers on self-concept of people with learning disabilities is that they perceive the concepts "mental handicap," "learning difficulty," and

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"learning disability" as degrading and stigmatizing, and prefer not to identify with any of these labels (Booth & Simons, 1989; Jahoda, Markova, & Cattermole, 1988; Oliver, 1986). Harris extends this argument, suggesting that the treatment of people according to their group membership affects their self-esteem if they belong to a negatively valued social group. There is also considerable evidence that one possible response of members of a devalued social group is to distance themselves from that group (Booth & Simons, 1989; Jahoda, Markova, & Cattermole, 1988; Oliver, 1986). As previously discussed, the presence of paraprofessionals or AT can sometimes cause students with disabilities to unwittingly assume a stigmatized identity, which in turn has the potential to affect their self-esteem/self-concept.

MacMaster, Donovan, and McIntyre (2002) examined the effects of being diagnosed with a LD on elementary school students' self-esteem. They found that students diagnosed with LD reported higher levels of self-esteem after the diagnosis, and suggest that the positive change in self-esteem might be attributable to these students comparing themselves to peers with LD. This finding runs counter to other studies that report negative self-perceptions of students with LD (Albinger, 1995; Bear, Minke, & Manning, 2002; Elbaum, 2002; Stone & May, 2002; Weiner, 2004).

Heyman (1990) examined whether there was a significant relationship between self-perception of students with LD and academic self-concept and overall self-esteem. Participants included 87 students with LD aged 9-11 years of age. Heyman reported that the self-perception of students with LD impacts academic self-concept and self-esteem. Heyman also suggests that self-perception and self-esteem may affect academic achievement.

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Albinger (1995) conducted a qualitative study to investigate how children felt about being diagnosed with a LD and how they perceived themselves as a result of their LD. Eight elementary-aged students receiving special education services participated in the study. Albinger reported that students in the study constructed or fabricated stories of their LD to protect themselves from negative perceptions and rejection by peers. Albinger also found that students' self-descriptions reflected low self-esteem. Albinger admitted that it was unclear whether identification contributed to low self-esteem or if low self-esteem resulted from students' self-deprecating feelings of inadequacy or the perceived negative judgement of others.

Self-concept and Identity

According to Baumeister (1982) self-concept and identity are closely related, since they refer to definitions of the self. Baumeister describes "self-concept" as an individual's beliefs about himself/herself and "identity" as a definition of who an individual considers himself/herself to be.

Shakespeare (1996) describes identity as a complex and nuanced term used in different contexts by social psychologists, sociologists, political scientists, cultural critics, and philosophers. Shakespeare frames his discussion of identity within the context of the medical model/social model dichotomy, suggesting that medical approaches to disability view negative self-identity as a consequence of impairment while social approaches view negative social identity as the result of the experience of oppressive social relations. Shakespeare offers that identity is best understood as narrative or stories individuals tell about themselves.

Goffman (1963) explores identity formation through theories grounded in personal presentation. Several theorists agree with Goffman that visibility is central to the management of and reaction to a stigmatized social identity (Kaufman & Johnson, 2004; Quinn & Chaudoir, 2009). Goffman also asserts that disability is a form of stigma and a discrediting label that attributes undesirable characteristics to the individual in what he calls a "spoiled identity." Goffman also explores the visible/invisible dichotomy by discussing how individuals negotiate the challenges involved in determining where, when, how, to whom, and whether to disclose their difference. Beatty and Kirby (2006) draw on Goffman's ideas in exploring the role of information management in the lives of individuals with invisible social identities, suggesting that people with stigmatizing invisible differences may choose whether to reveal their difference or select the conditions or contexts within which the disclosure takes place.

In a study of 42 students with LD in a large university, Lightner, Kipps-Vaughan, Schulte, and Trice (2012) examined students' reasons for postponing access to services and determined that their decisions centred on feeling stigmatized. The researchers reported that interpersonal understanding, such as students' beliefs about peers and faculty's perceptions of their intellectual abilities, and intrapersonal understanding, such as feelings of inadequacy, played a major role in students' decision to access academic accommodations. Despite being conducted in a post-secondary setting, students' responses to accessing specialized services appear to be consistent across multiple educational contexts.

Impression management theory and dramaturgy (Goffman, 1959) describe how individual actors create, maintain, defend, and often enhance their social identities

through assumptions, settings, props, and scripts in a play metaphor. Goffman's dramaturgical approach uses the theater as a metaphor to explain how individuals as social actors make identity claims and prepare for and perform roles in social interactions. The dramaturgical approach offers insight into the complexity of the situational contexts that students accessing SEA funded computers negotiate at different times in their daily social interactions. Goffman's idea of the social stage (e.g., front stage, back stage) opens up the possibility that technology places students on the front stage when they are singled out by the teacher or participating in computer training in the presence of peers. It is worth exploring whether being front stage causes students to assume a stigmatized identity. Conversely, it is useful to determine whether students assume a stigmatized identity when they occupy a back-stage position (e.g., sitting in a classroom at their desk or on the playground with friends).

Literature Review: Tensions between LD Label and Personal Empowerment through Technology

A review of literature on AT revealed a void in research specifically addressing the value and efficacy of AT. According to Edyburn and Smith (2004), several factors contribute to the dearth in evidence-based data relating to the outcomes of AT. One reason cited for this void is professionals' focus on providing interventions using AT to address problems, with no emphasis on collecting data. Another reason highlighted is the absence of any real commitment on the part of professionals to measure AT outcomes and the subsequent impact on quality of service delivery models. Edyburn and Smith (2004) also note that the emerging literature on AT is philosophical and theoretical in nature. Edyburn (2005) conducted a synthesis of literature between 1999

and 2003 and notes that the growing number of articles on AT are largely focused on practice rather than efficacy. Edyburn attributes this to the lack of measurement tools to critically measure the outcomes of AT.

Okolo and Bouck (2007) conducted a synthesis of literature to shed light on the nature of knowledge on AT between 2000 and 2006, and describe the approach to AT research as "scattershot" in nature, with no notable systematic body of research on particular groups of students with disabilities. McKnight and Davies (2012) likewise suggest that although there is increasing understanding of the needs of learners and of the capabilities of technology, there is need for longitudinal studies that examine AT in broader contexts and its impact on users' overall education and well-being.

In like manner, Graham and Richardson (2012) note that AT implementation in public education contexts tend to place greater emphasis on the technology than the pedagogy, resulting in a critical barrier in the effectiveness of AT use. In responding to the implicit barriers in the effective implementation of AT, Graham and Richardson conducted an exploratory qualitative research study to investigate the current barriers affecting the effective integration of AT in the school system. The participants included 2 principals of schools with staff complements of 20-26 teachers and student populations ranging from 237 to 289. The barriers identified include parent's unawareness of the value of AT, lack of time for teachers and students to learn to use AT, finances, and the perception that AT is a special-education tool. Another significant finding of the study concerns the key role that pedagogy should play in determining technological solutions to address the types and range of abilities/disabilities in the classroom. In other words, educators require more insight into why students should use the technology and how it

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enhances their learning. Other researchers (Dell, Newton, & Petroff, 2012) similarly suggest that teachers and students should be specifically trained to use technology in academic contexts in order to reduce the incidence of distractions caused by technological devices.

Several studies have shown that assistive technology enables students with learning disabilities to perform tasks more efficiently and independently (Blackhurst, 2005; Edyburn, 2005; Forgrave, 2002; Scherer, 2005). The use of AT computer programs such as Kurzweil, Dragon Naturally Speaking, Inspiration, and Premier Tools provide students with a compensatory alternative with which assigned work can be completed at an acceptable standard that may otherwise have been difficult, if not impossible, to attain. According to Batorowicz, Missiuna, and Pollock (2012), AT enhances writing skills of students with LD by allowing them opportunity to circumvent the mechanics of writing. Blackhurst (2005) further argues that technology has the potential to improve the education and quality of life of individuals with learning disabilities. Other researchers (Duhaney & Duhaney, 2000; Garrison-Harrell, Kamps, & Kravits, 1997; Mirenda, 2001) have similarly found that AT enhances independence, increases learning opportunities, and improves students' self-esteem through increased productivity.

Recognizing the need to address gaps in measuring AT outcomes, Tam, Mays, Archer, and Skidmore (2005) administered the Canadian Occupational Performance Measure (COPM) to 29 students between ages 3.9 and 19 years with physical and learning disabilities to determine the effectiveness of WordQ in enhancing the written productivity of students. The WordQ program utilizes text-to-speech and word prediction

technology to assist users with writing tasks. The families and students reported that use of WordQ resulted in increased productivity, increased motivation to write, and increased independence with spelling and writing tasks. Peterson-Karlan (2011) similarly suggests that word prediction software increases transcription accuracy, word fluency, and overall quality of writing.

Although research overwhelmingly recognizes the efficacy of assistive technology in empowering students with learning disabilities, not much emphasis is placed on how students negotiate tensions between empowerment through technology assistance and their perception of being labelled as having a learning disability. Gillman, Heyman, and Swain (2000) succinctly describe the dilemma of students labelled as having a learning disability as a double-edged sword. The authors further assert that whilst the acquisition of this label opens doors to resources, being labelled as such can also lead to disrespectful and unacceptable treatment. Harris (1995) similarly posits that persons with LD are easily identified as a consequence of the segregated nature of services being provided. This position is a fitting description of the way in which services are offered to SEA students, forcing some to weigh the cost of the negative effects of being labelled with a disability against the promised benefits of empowerment and academic independence through assistive technology.

Some literature examines the relationship between stigma and AT usage by focusing on factors that contribute to stigmatization, such as device aesthetics, gender and age appropriateness, social acceptability, and universal design principles (Parette & Scherer, 2004). Still others have focused on the stigma that generally surrounds special education and the way that negative perceptions of students with learning disabilities

influence response to supports (Craig, Craig, Withers, Hatton, & Limb, 2002). Today, with the high rate of abandonment of AT devices (Scherer, 2005), it has become increasingly important to examine tensions between the promise of technology empowerment and students' perception of this accommodation. My literature review unearthed no research that has examined this phenomenon.

Despite an overwhelming body of evidence related to the capacity and potential of AT, it is important to understand the social contexts within which AT usage occurs. Of particular significance is the special nature of AT and its prevalent use by students with learning disabilities. Another consideration is the segregated setting in which AT training and usage occurs. This is especially evident for students requiring the use of a speech-to-text program such as Dragon Naturally Speaking that necessitates use in an isolated/quiet setting to be effective. As such, while it has been noted that AT contributes to independent functioning and enhanced learning, its use has been stigmatizing for users who internalize the perception of being academically inferior because of a disability diagnosis and the attendant intervention of AT.

Several researchers (Altman, 2001; Linan-Thompson & Jean, 1997; Taylor, 2000) note that disability is not an objective neutral term, but instead reflects a complex, socially constructed concept filled with value-laden assumptions. Research overwhelmingly affirms the position that many people with learning disabilities do not believe that being labelled as "learning disabled" is relevant to their identity (Beart, 2005; Davies & Jenkins, 1997; Gillman, Heyman, & Swain, 2000; Harris, 1995). Possible explanations for this stance is that concepts of disability are thought to have negative consequences for people with disabilities arising from overgeneralization and

negatively valued stereotypes or prejudice about their relative value (Harris, 1995).

People with learning disabilities have the distinction of not being readily identifiable

because their disabilities are not immediately apparent to others (Canary, 2008). In

exploring the implications of the stigma associated with the use of AT, one common

notable outcome is the distancing from, subsequent abandonment of, and

disengagement with AT. With the high rate of abandonment of AT devices (Scherer,

2005), it has become increasingly important to examine tensions between the promise

of technological empowerment and students' perception of this accommodation. My

literature review unearthed no research that has examined this phenomenon.

Chapter 3: Methodology

This chapter focuses on how the study was conducted. The first section provides a broad description of the methodology used, while the second section provides a rationale for the selection of study participants. The third section addresses data collection strategies, and the final section details the process by which data were analyzed during the course of the study.

The central guiding question of this study was "Is the promise of technology assistance for students experiencing learning disabilities compromised by the visibility of the support?" This question was explored with a qualitative research design based on interview data and researcher reflective journal field notes (Patton, 2002). According to Merriam (2002), qualitative research is descriptive and inductive, focusing on uncovering meaning from the perspective of the participants, particularly in terms of how meaning is constructed and how people make sense of their lives and their world. Creswell (1994) suggested that a qualitative study possesses the following characteristics: (a) an investigative and descriptive emphasis, (b) evolving design, (c) data collection in the natural setting, (d) emphasis on "human-as-instrument," (e) qualitative methods of data collection including interviews and observations, and (f) constant data analysis of text.

Research Questions

The key questions guiding this inquiry are:

1. Is the promise of technology compromised by the visibility of technology support, and how do students who access technology through SEA negotiate the related social dynamics?

2. What does the diagnosis of a learning disability mean to students and their parents?

3. What are the particular experiences and contexts within which students that access technology through SEA are trained?

4. How do teachers, parents, and trainers see their role in the technology assistance program?

Grounded Theory

The specific methodology guiding the data collection and analysis was grounded theory (Glaser & Strauss 1967; Strauss & Corbin, 1990). Merriam (2002) describes grounded theory as a general methodology for developing theory resulting from data that has been methodically collected and analyzed. Theory advances throughout the research process by ongoing interchange between data collection and analysis (Charmaz, 2000). According to Glaser and Strauss (1967) the term "grounded" refers to the idea that the emergent theory results from, and is "grounded" in, the data that have been collected in the field, rather than data that have been taken from the research literature. Grounded theory studies are especially helpful when current theories about the phenomenon may be either inadequate or non-existent (Glaser & Strauss, 1967). The fundamental assumption of grounded theory is that researchers do not begin with a

theory that they attempt to prove. Instead, an area of study is identified and then a theory is allowed to emerge from data that has been collected. Charmaz (2000) puts forward the simplified notion that in grounded theory research, data forms the foundation of the theory while concepts are derived from data analysis. Charmaz similarly suggests that researchers use grounded theory to learn what occurs in research settings and gain insight into what research participants' lives are like.

Grounded theory researchers begin with data assembled through interviews, observations, and materials collected about a particular topic. Coding begins with the collection of data, as does the definition and cataloguing of data in what Glaser (2000) calls the constant comparative method.

The grounded theory methodology was chosen for this project because the research study was undertaken to explore and understand how students with learning disabilities who are users of AT make sense of this experience. Since qualitative research seeks to uncover how people make meaning or interpret a phenomenon, this approach to research was chosen to give voice to participants whose perspectives have traditionally been absent from research about their lives (Merriam, 2002). Creswell (2007) similarly suggest that a theory grounded in data is able to embody the complexities and interactions involved in a particular phenomenon.

Participant Selection

In order to gain insight into the everyday experiences of students accessing AT equipment and training, research participants were selected based on their ability and willingness to provide first-hand "rich descriptions" of their experience with AT. The

selection of participants centred on the principle of purposive sampling (Mason, 2002; Patton, 2002) that aims to select "information rich cases" (Patton, 2002) that significantly illuminate issues of central importance to the phenomena under investigation. For this study, participant selection was aimed at ensuring that key stakeholders were represented and diversity was included, so that the construct of students' responses to AT could be explored in detail in the specified context (Ritchie & Lewis, 2003). In all, I interviewed 11 participants and focused my analysis on the transcripts of the most richly descriptive of these.

Five secondary school students between 16 and 18 years of age from three schools in Central and Southern Ontario constituted the participant pool. Two of the three schools in the study are located in predominantly white, middle-class neighbourhoods. The third school in the study is located in the west end of Toronto in a community reflecting significant diversity in race, culture, and socioeconomic status compared to the other two schools in the study.

Consistent with the concept of purposive sampling, students were recruited through special education programs in schools that routinely provide AT as a form of accommodation for students with learning disabilities. The student participants were selected based on the following criteria:

- All student participants had to be recipients of SEA computer equipment and training (for at least one year).

- All students had to be at least 16 years old at the time of the study.

- All student participants were able to understand and sign the Student Assent Form (see Appendix B).

- All students either had an IEP or were diagnosed with a learning disability.

Older student participants were selected on the basis that they are more likely to have the capacity to reflect on and provide full and sensitive descriptions of their lived experiences, which is essential for in-depth phenomenological interviews (Creswell, 2007; Polkinghorne, 1989). It is interesting to note that there was in fact a huge disparity between the depth and quality of responses provided by student participants in grades 11 and 12 compared to participants in lower grades.

Although it was originally planned that parents of each student involved in the study would be interviewed, in the end – because of availability, scheduling conflicts, and willingness to participate – parents of other SEA recipients were interviewed. Similarly, in the interest of representing the perspectives of educators who are involved with students in their use of assistive technology, one teacher and one educational assistant were interviewed. The sample selection also included two assistive technology trainers who were involved in the provision of technology training to SEA recipients. Given my involvement as a researcher and assistive technology trainer at the time of the study, I was constantly aware of the epistemic privilege that my insider-outsider position afforded me. A central concern in the participant selection process was ensuring that participants were not chosen in a way that reflected any pre-existing biases and perceptions I held. For example, as a trainer I was able to observe students' and teachers' attitudes toward assistive technology. However, in the interest of

obtaining rich data for the study each participant had to possess firsthand experience with the phenomenon under investigation.

Both parents in the study were women, and both admitted to advocating for their children to receive assistive technology. Also, both women were very involved in their children's education and were open to sharing insights into their children's experience and responses to assistive technology. The women provided very useful specific examples of their children's response to assistive technology. Similar to parent participants, the two assistive technology trainers in the study were women. Having worked in multiple schools in several different communities, both trainers talked at length about their observations and experiences as assistive technology trainers in various environments. The educators in the study were both women, and as a result of their day-to-day involvement with SEA recipients, they provided in-depth insights and examples of their particular roles, perspectives, and observations of students' responses to AT. Of the five students in the study, 4 were male and 1 was female. While this was not a comparative study, participants were chosen from schools in communities that reflect varying socioeconomic levels, to avoid over-generalization while attempting to get a diverse understanding of student attitudes toward AT.

The following table provides a summary of the characteristics of the study participants:

Table 1: Demographic Profile of Participants

Pseudonym	Ethnicity	Age Range	Sex	Role
Sandra	Caucasian	40 - 60	Female	Parent
Maureen	Black	40 - 60	Female	Parent
Susan	Caucasian	40 - 60	Female	AT Trainer
Anna	Caucasian	40 - 60	Female	AT Trainer
Jane	Black	40 - 60	Female	Educational Assistant
Donna	Caucasian	40 - 60	Female	Teacher
Christopher	Caucasian	16 - 18	Male	Student
Stephanie	Caucasian	16 - 18	Female	Student
Patrick	Caucasian	16 - 18	Male	Student
Gary	Caucasian	16 - 18	Male	Student
John	Caucasian	16 – 18	Male	Student

Recruitment

Adults in the study were contacted by phone, by email or both. Students under 18 years of age were referred by teachers who were aware of the study and were interested in helping me find participants who met the selection criteria. In recruiting students for the study I was very concerned about their willingness to participate, given that they might not be willing to openly discuss how they feel about AT. I was also concerned about their availability in light of the fact that summative exams would begin in a few weeks. One student who was already 18 at the time of the study became aware of the project through a previous conversation during an AT training session. This student communicated an interest in participating and, after exchanging several emails, we were able to schedule a time and place for the interview. Another student expressed her willingness to participate in the study in a previous AT training session and provided a list of available dates and times for the interview. The other three student participants were referred by teachers who were aware of the study and selection criteria. Each student participated in the study without coercion. Efforts were made to contact another student who had expressed an interest in being interviewed for the study; he, however, failed to show up at the scheduled interview date and time. After exchanging several emails with the student's teacher about the possibility of rescheduling, I was eventually informed that the student had changed his mind about participating and was no longer using his laptop: he had not collected it from the teacher's office (where it is stored) for several weeks. The teacher stated it this way: "I think Corey [pseudonym] is a bit of a dead end for you re his use of [the] laptop. It has not moved from my office for 2 weeks and he seems hesitant to help out in this way."

The two AT trainers interviewed had expressed interest in participating in the study. Both were initially contacted by phone, and emails were exchanged to finalize the meeting place, date, and time. Both AT trainers requested that the interview questions be sent ahead of the scheduled interview time. The two parents in the interview were chosen based on their availability, willingness to participate, and the richness of data that I anticipated they would provide. In fact, one parent had three children that were SEA recipients, and the other parent was very involved in advocating for her child to receive the SEA equipment and training. Both interviews were arranged via email and confirmed by phone.

The teacher participant was very interested in my study from the outset and had offered to participate if the need arose. The interview date and time was arranged via email and a copy of the interview protocol was requested and emailed ahead of the interview.

Although participants' ethnicity was not a major variable in the recruitment process, I was very happy to be contacted by an educational assistant who was interested in being a participant in the study. Her participation was important on several levels. First, as an African-Canadian woman, the educational assistant's participation added an element of diversity to the sample. Secondly, in exploring the phenomenon under investigation, the role of the educational assistant was integral to the study, given their strategic involvement with students with special needs such as learning disabilities. The interview date and time was arranged by phone and a copy of the interview protocol was requested and emailed ahead of the interview.

All interviews with students, teachers, and the educational assistant were conducted in their respective schools. Other interviews were conducted either in the homes or offices of participants.

Human Subjects

The proposal was sent to the Human Participants Review Subcommittee at York University for approval. No participants were involved in the study before the review and approval were obtained. The Certificate of Ethics Approval and Informed Consent Forms are attached as Appendices A, B, C, and D.

Informed consent forms were signed by all adults in the study. A Student Assent form was completed by all student participants. No negative outcomes were experienced by participants in the study, and all participants were informed of their rights to reschedule or cease participation in the study at any time. The terms of the Informed Consent Form were reviewed with each participant before the start of the interview. No participant was coerced to participate and all were happy to contribute to the study. The participants were open about their experience and all agreed to be audio-taped. Although the intention during the design phase was to have two separate interviews with each participant, during the course of our meetings all participants suggested that they would answer all questions in one meeting. As a result, I referred to the earlier questions in the interview as Part A and the latter questions as Part B.

Confidentiality was maintained for the subjects by changing the names of locations and their names to pseudonyms. The pseudonyms were used in all written records. Only the researcher and supervising professor had access to the actual

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names, addresses, and phone numbers of the participants. These remained in a locked cabinet. These will be destroyed three years after completion of the data analysis.

Data Collection

For this study, data were collected in the form of in-depth, phenomenologically based interviewing (Seidman, 2006) and reflective journal field notes. Phenomenological interviewing transcends merely soliciting answers to questions or testing hypotheses, and is based on researchers' interest in understanding the lived experience of participants and how they make meaning of that experience. This method of inquiry "is a powerful way to gain insight into educational and other social issues through understanding the experience of the individuals whose lives reflect those issues" (Seidman, 2006, p. 14). At the core of phenomenological interviewing is the need to uncover the essence of the experience of a specific phenomenon. The phenomenon investigated in this study was the experience of students accessing technology through SEA funding in schools and, in particular, what shaped their responses to AT. Phenomenological interviewing was thought to be the best method of understanding the context and experiences within which students access technology assistance.

Questions in the interview protocol were designed in a way that allowed participants to articulate their experience with AT. Based on the literature on technology and learning disabilities (Blackhurst, 2005; Edyburn, 2005; Scherer, 2005; Kemp & Parette, 2000; Parette, VanBiervliet, & Hourcade, 2000; Parette, 1998; Specht, Howell, & Young, 2007), as well as my own experience as an AT trainer, I identified four themes

that were useful in guiding collection of data during the in-depth interviewing process. These included: (a) attitudes of core stakeholders toward technology, (b) students' and parents' understanding of learning disabilities, (c) identity and self-concept issues with technology assistance, and (d) tensions between the learning disability label and personal empowerment through technology.

One interview of 30-60 minutes' duration was held with each student who was asked to read and sign a Student Assent Form (Appendix B) before being interviewed. It was interesting to note that older students had longer interview sessions because of their openness in articulating their experience as users of AT. One 40-60 minute interview was held with parents, educators, and AT trainers. Adult participants were asked to read and sign Informed Consent Forms (Appendices C, D, and E) before proceeding with the interview. Interviews were audio-taped to avoid any loss of data, and tapes were transcribed verbatim by the researcher and volunteer transcribers. The resulting transcripts were checked for accuracy by the researcher and emailed to participants for clarification where there were gaps in the data. Interview questions were developed from the literature, my own experience as an AT trainer, and dialogues I have had with SEA students, school administrators, and colleagues within the field of AT.

The first section of the interview focused on the experience of each group of participants within the education system before becoming involved with assistive technology. An early understanding of how participants experienced and viewed technology prior to accessing technology through SEA funding provided possible insights into their response toward AT. I was also interested in finding out how students

and parents became involved in the SEA process (whether by referral or through parental advocacy) and about the nature of their experience. The later questions in the interview focused on students' understanding of the diagnosis of learning disability, their current experiences as recipients of AT training, their use of the computer at school, the usefulness of computer programs and training, and their feelings about having computer training and equipment at school.

Parents were specifically asked about their understanding of the diagnosis of learning disability, their child's awareness and understanding of this diagnosis, how the diagnosis was communicated to their child and by whom, and the child's response to being identified as having a learning disability. Both parents and teachers were questioned about their actual and perceived roles in the SEA process.

I originally felt that formal observations of students in their schools or "natural settings" would have allowed for deeper, richer understanding of the actions of SEA students with regard to their use of assistive technology. The idea was eventually abandoned after several unsuccessful attempts to find willing participants. Also, there were concerns about observer effect, given the researcher's professional involvement with the study participants. In place of formal observations the researcher opted to utilize her reflexive journal field notes as a data source.

Reflective Journal

In spite of their best efforts, researchers may unconsciously project their knowledge and experience onto the research process (Tisdell, 2002). I was admittedly deeply invested in the study both as a researcher and assistive technology trainer for

students with learning disabilities. While conducting the study, a source of conflict for me was embedded in the political nature of conducting research that examines technology assistance while playing an integral role in assistive technology implementation in schools. The ambiguity of being positioned as a researcher of assistive technology while working as an assistive technology trainer generated several tensions throughout the process for the following reasons:

- Prior to conducting the study, I was a contract AT trainer in each research setting from January 2007 to June 2010.

- Working as an AT trainer for 4 years allowed me to become immersed in the culture of the schools and the lives of SEA students.

- Multiple training sessions for each SEA student allowed me to forge relationships with teachers, students, and parents.

- I was able to observe what happened in these settings; interact with SEA students, their teachers, and their parents; listen to what was said; and even to ask questions.

Lather (1986) posits that there is no "neutral research" and argues that researchers must acknowledge that their personal values influence the theoretical basis and theoretical interpretation of the research. Lather further suggests that researchers utilize deeper self-reflection and understanding of their research contexts. I therefore undertook this study being mindful of personal biases and judgments as a result of the unique vantage point from which I was able to observe SEA students' responses over

an extended period of time, my epistemic knowledge of the AT process, and my relationship with participants. Coincidentally, during the transcription and data analysis phase of the study, my role changed from providing assistive technology training to content development for an assistive technology website. This move created distance and allowed me to look at the data without being directly involved with the technology assistance process and study participants.

According to Morrow and Smith (2000), the use of a reflective journal adds rigor to qualitative inquiry, since the researcher is able to record his/her reactions, assumptions, expectations, and biases about the research process. Other researchers (Tricoglus, 2001; Ball, 1990) similarly challenge researchers to be reflexive so that they can monitor their involvement and reflect throughout the research process. Constant reflection on my personal values was therefore a critical element in the research process. To address possible biases that could arise from my immersion in AT and involvement with research participants, I utilized a reflective journal throughout the study where I recorded thoughts, decisions, tensions, questions, challenges, and insights related to the study. The journal field notes provided additional data for the analysis.

As a neophyte researcher, the reflective journal served many purposes. For example, I was extremely anxious about my choice of data collection tools, their reliability, and the availability of participants who would provide rich descriptions of their engagement with AT. Maintaining a journal allowed me to record and make sense of my concerns. The following extracts from my journal provide examples of how it was used to reflect on my ideas and thoughts: "Unexpected challenges: unavailability of student participants, scant or inadequate responses of younger students" (Reflective Journal

Entry, November 16, 2010). "Not being in the schools this school year, how does this impact my approach to this project? Am I less interested and/or connected to my study?" (Reflective Journal Entry, November 20, 2010).

Data Analysis

The constant comparative method was used to analyze interview transcripts and field notes in this study (Lindlof & Taylor, 2002; Strauss & Corbin, 1998). Given that several different groups were interviewed for the study, this method was useful in grouping answers to common questions and for analyzing different perspectives on central issues. All interviews were audio-taped and transcribed verbatim by a combination of a professional transcriptionist, volunteer transcriptionists, and the researcher. The data were then checked for accuracy by listening and comparing the audio-taped interviews to the transcribed notes. Subsequently, the data were read and re-read several times, allowing for immersion within the data and clearer interpretation of the data. The data analysis was conducted using three levels of coding: open coding, axial coding, and selective coding (Strauss & Corbin, 1998; Charmaz, 2000).

According to Charmaz (2000) the aim of open coding is to discover, name, and categorize phenomena. Charmaz further explained that open coding is particularly concerned with the labelling and categorizing of phenomena. In this study, open coding was used to identify and compare participants' descriptions, views, actions, situations, and experiences as they negotiated the dynamic of technology assistance. Instead of using a qualitative software package as originally planned, interview transcripts were read line by line and manually coded by inserting comments (using Microsoft Word)

where a specific statement indicated a salient aspect of the experience being investigated. Manual coding of the data allowed the researcher to understand the mechanics of the analytical process while working very closely with and making sense of the data. Comparisons were made to establish relationships, similarities, and differences between different responses. Different parts of the data were then labelled for further analysis. Since open coding is concerned with identification and naming, it was important to use descriptive labels found within the data/content to label significant events and ideas. For example, the term "stigma" was a recurring concept and descriptive label and therefore, in the interest of elaborating on this concept, my own comments were included in the form of memos. According to Glaser (2000), the writing of theoretical memos is a core activity in the grounded theory process. Glaser defines theoretical memos as the write-up of ideas about codes and their relationships as they strike the analyst while coding. This means that the researcher writes down ideas that arise during the data analysis. The use of memos allows for the construction of theories from the various categories and of properties that have emerged from the data as a result of the coding process, and also allows for the identification of links between the various themes/categories. Glaser further suggests that writing memos is important because it encourages analysis that is grounded in the data, since the researcher must consider how the codes and their properties relate to each other and must provide evidence of this from the data. Glaser also argues that this form of comparative reasoning undoes *a priori* assumptions because it forces the researcher to keep focusing on the data.

Once the core categories were established and named, the axial coding phase allowed for the reassembling of data that was fractured during open coding. Whereas the open coding process facilitated the identification and naming of categories, the axial coding process allowed for the formation of links and relationships. In axial coding, data are put together in new ways. In this step, data generated from open coding were used to make new connections between categories and subcategories to develop several broader thematic categories (Strauss & Corbin, 1998). These connections were achieved by exploring the conditions, contexts, actions/interactional strategies, and consequences that influence the phenomena being studied. In the axial coding phase, the researcher was focused on each category in terms of the conditions that give rise to it, the context in which it is embedded, the strategies that people use to manage it or carry it out, and the consequences of those strategies. For example, in exploring the theme of "stigmatized identities" the researcher was intent on finding clues in the data that provided insight into factors that contributed to stigmatized identities, the contexts/circumstances within which students felt stigmatized (e.g., settings, equipment, peers, etc.), how SEA students negotiated stigmatizing situations (e.g., face-saving or impression management strategies), and the outcome/consequences of the strategies employed in managing a stigmatized identity (e.g., refusal to participate in training or abandonment of SEA equipment). Instead of working on a continuum, as more data were collected the researcher moved back and forth between open coding and axial coding, continually refining categories and their interconnections. These new groupings facilitated a more complete explanation of participants' experience with assistive technology.

In another instance, the researcher utilized open coding to analyze responses to the question, "How would you describe your child's/students' response to AT?" The researcher started the open coding process with a line-by-line analysis by extracting concepts behind participants' responses. For example, the concepts "varied," "never embarrassed," "enthusiastic," and "stigma" were extracted from the interview transcript. Based on the list of concepts generated in open coding, the researcher proceeded to the axial coding stage by identifying connections between concepts, in order to group items that share common properties or characteristics. For example, grouping similar items allowed the researcher to create the initial category, "Divergent responses to AT ranging from enthusiasm to abandonment of AT."

The final step in the coding process is selective coding. Selective coding is the process of selecting the core (main) category and systematically relating it to the other categories. During selective coding, categories and their interrelationships are combined to form a "storyline" that describes what happens in the phenomena being studied. The saturation of categories is examined in this step until no new information emerges. To integrate the coding process, the researcher utilized techniques such as writing and relating the participant's stories to central facets or elements; using diagrams and tables; and reviewing field-journal notes and the reflexive journal written by the researcher throughout the data-gathering and analysis process.

An example of the open and axial coding utilized during data analysis is illustrated in Table 2 below:

Table 2: Open and Axial Coding

Question	Interviewee Code	Transcript Excerpt	Open Coding	Axial Coding
How would you describe your child's/ students' response to AT?	P-1	I think he is glad to have it… Now he uses it more… he was never embarrassed to use it.	Glad, uses it more, never embarrassed	Divergent responses to AT that range from enthusiasm to abandon-ment of AT.
	P-2	Their response to tech assistance within the school setting has not been good. None of them at any stage, which has been very frustrating.	Not good, none of them, at any stage, frustrating	
	AT-1	Either they're so enthusiastic… even the ones who are happy to have it… they just want access to, really, the internet or the Quick Pick… and then there's the camp that doesn't want anything to do with this.	Enthusiastic, happy, access to internet, Quick Pick games, want nothing to do with it	

	T-1	It's varied. There are some kids who eat it up… there are some kids whose laptop sit[s] in my office and never leaves here… if we were to divide it up… a third to a half think it's fabulous and the others could take it or leave it because of the stigma.	Varied, kids eat it up, laptops sit in office, laptop never leaves, fabulous, take it, leave it, stigma	

Note: Coding was supported by memos or "notes to self." Below is an example of a memo item during coding:

- AT-1 and T-1 share the same view, in that students' responses are mixed and range from enthusiasm to refusal to engage with AT.

- P-1 and P-2 provide contrasting views of children's responses.

Trustworthiness

Qualitative research uses a naturalistic approach (Denzin & Lincoln, 2000; Creswell, 2007) that seeks to understand phenomena in context-specific or "real-world" settings where the researcher does not seek to manipulate the phenomena of interest

(Patton, 2002). Unlike quantitative researchers who seek causal determination, prediction, and generalizability of findings, qualitative researchers seek illumination, understanding, and extrapolation to similar situations (Hoepfl, 1997). Despite the methodological and philosophical differences in their approaches to research, Patton (2002) argues that both quantitative and qualitative researchers need to demonstrate that their studies are credible.

To ensure credibility of my research findings, I took several measures to address and minimize the potential impact of my "researcher as instrument" (Creswell, 1994; Patton, 2002) position. First, I ensured transparency throughout the data collection and analysis phases by maintaining email contact with study participants; I asked the participants to verify my initial understandings of the major points from the interview. This process ensured that participants' voices, rather than my own, are represented in the findings (Lincoln, 1995), as evidenced by the extensive use of participants' direct quotes throughout the discussion.

Second, to reduce the impact of my subjectivity based on the epistemic privilege that my position afforded, I utilized peer debriefing and a reflexive journal where I recorded thoughts, decisions, questions and insights related to the research. For example, a colleague with expertise in qualitative methods conducted the peer review by examining and questioning my participant selection criteria and interview protocol, in order to ensure that my assumptions and biases regarding the context, participants, and data were kept to a minimum. Moreover, the thesis supervisor was contacted on a regular basis for review of transcripts, data transformation, and analysis.

Third, I utilized multiple data collection methods and multiple data sources as a means of triangulation to ensure consistency, dependability, and greater data reliability. Data source triangulation was performed by collecting data from parents, students, educators, and assistive technology trainers. Collecting data from several sources allowed for cross-checking of information and deeper understanding of students' experiences with AT.

Fourth, I practiced reciprocity through the use of self-disclosure during interviews, asking participants to examine field notes and engaging in member checks. For example, the researcher started each interview by sharing her background and explaining her position and motivation for undertaking the study. At the end of the interviews, participants were given an opportunity to ask questions about the study and the researcher. For example, one student participant asked about the availability of AT in postsecondary institutions. I was able to provide this student with information and advice about the AT process in colleges and universities. I remained accessible by providing participants with my contact information in the event they had questions or concerns.

Finally, I made every attempt to ensure transparency in the research process. My research study provided detailed accounts of how participants were recruited, how data were collected and analyzed, researcher positionality, and limitations of the study.

Chapter 4: How Students Who Access Technology through SEA Negotiate the

Dynamics of Technology's Promise and the Visibility of Technology Support

> They don't like being centered out and having a unique
> or specific need that's not kind of the same for others.
> So that technology then becomes like a red flag, "oh
> here I am and I have all these differences and so I need
> to have something special to work on"… all have felt
> centered out and stigmatized by it. (Parent participant
> Sandra, 2010)

Parents, teachers, and trainers were asked about students' responses to

receiving technology assistance through SEA. Both parents interviewed admitted to

initiating the assessment process and advocating for their children to receive SEA

equipment. This approach is consistent with Edyburn's (2005) position that students

who access AT often have the support of parents who are very involved in their

education. Other researchers (Gillman, Heyman, & Swain, 2000) similarly suggest that

in some instances, parents are supportive of having their child identified in order for

them to gain access to resources such as technology assistance and social support. On

the whole, both parents, Sandra and Maureen, provided mixed responses to this

question. Sandra expressed concern and frustration that all three children responded

negatively to receiving SEA computers from their respective schools. The researcher,

while previously working as a contract AT trainer in the school setting, observed that

younger students (Grades 4-5) are generally enthusiastic to receive SEA equipment

while older students (Grades 6-12) displayed a more negative response to technology

assistance. Despite this, Sandra expressed that although her children's grade level

ranged from Grade 4 to 11 there was no difference in their response to technology

assistance. Sandra explains her frustrations this way:

> Their response to technology assistance within the
> school setting has not been good. None of them at any
> stage, which has been very frustrating, very frustrating,
> and it's really interesting because I feel it comes from…
> that feeling of being separate from, and identified as
> being kind of different from, the norm in the classroom.

As noted above, Sandra provided further insights into the reasons for her children's

response to AT, adding that:

> They don't like being centered out and having a unique
> or specific need that's not kind of the same for others.
> So that technology then becomes like a red flag, "oh
> here I am and I have all these differences and so I need
> to have something special to work on"… all have felt
> centered out and stigmatized by it.

An important theme to emerge from the study is the idea that students feel

stigmatized by the presence of SEA computers as part of their special education

accommodation. Sandra's sentiments are consistent with the views expressed by a

number of researchers, who suggest that a student's self-concept within the academic

setting school is impacted by parents', teachers', and peers' perceptions of them (Bear,

Minke, & Manning, 2002; Elbaum, 2002; Schmidt & Cagran, 2008), in addition to social

comparison with peers in the same setting (Möller, Streblow, & Pohlmann, 2008). Beatty

and Kirby (2006) provide an apt description of Sandra's observation that her children

perceive AT as a "red flag" that centers out their differences, in suggesting that people

with stigmatizing invisible differences may choose whether to reveal their difference or

select the conditions or contexts within which the disclosure takes place. Goffman

(1963) argued that the visibility of a disability contributes significantly to producing a damaged identity. The term "stigma" means a "bodily sign designed to expose something unusual and bad about the moral status of" the person (Goffman, 1963, p. 1). Goffman further explored how individuals navigated the challenges involved in disclosing their differences to others in various contexts. Harris (1995) similarly suggests that segregated services tend to reinforce difference by making people with learning disabilities easily identified. This has obvious implications for the ways in which services are offered to SEA students, adding another layer of difficulty in accessing assistive technology. It is therefore conceivable that the risk of disclosure is something that many students are confronted with when assistive technology is seen as something that "centers them out."

Maureen expressed the idea that her son responded positively to AT. She explains that although, initially, her son was not using the technology because he did not have the skills to use the various programs, once her son became exposed to the AT programs his use of the technology increased. Maureen explains:

> I don't think [he used it] – especially in the beginning. Now he uses it more. I think a lot of it was more in the beginning that he didn't have the skills. Last week I was at the school and his tech teacher was talking about how good he is at using some of the programs… I think he is glad to have it… he was never embarrassed to use it.

The need for Maureen to point out that her son was not embarrassed to use his SEA equipment is an indication of the parent's awareness of the negative stereotyping that accompanies this accommodation. Maureen admits to staying in contact with her

son's resource teacher and classroom teachers to ensure that they are aware that he had the technology for use in his classes. Maureen's response is consistent with the views of GiacQuinta, Baucer, and Levin (1993), who found that students who used computers for educational purposes did so with hands-on parental involvement.

It is interesting to note the differences between Maureen and Sandra's views toward AT and, more specifically, their perspectives on their children's responses to AT. Maureen's description of her son's willingness to engage with AT has resulted in her assuming the role of ensuring that her son's teachers are aware and supportive of his accommodation. It is also noteworthy that Maureen appears to be more focused on the tangible benefits of AT for her son and less concerned with the negative social labelling arising from her son's use of AT. Despite being convinced of the positive outcomes associated with the use of AT, at the time of the interview, Sandra's primary concerns centered on employing "face-saving" strategies to minimize the stigmatizing effects of AT. This is especially evident in the description of her youngest child's response. It is also noteworthy that while Sandra's perspectives run counter to literature that suggests that strong parental advocacy is a predictor of students' willingness to engage with AT (Edyburn, 2005), Maureen's responses affirm this observation.

Two of the participants, Susan and Anna, provide technology assistance to students in their capacity as technology trainers. Both participants' direct involvement and immersion in technology assistance facilitated the provision of "thick" descriptions of their experiences and observations of students' response to technology assistance. In responding to the question, "how would you describe students' response to technology training?" Anna expressed that although there appeared to be a split or two

"camps" in students' response to technology assistance; she felt that both camps did

not appreciate the real reason for technology assistance in their schooling. Anna further

expressed that whereas one camp appeared enthusiastic, the other was vigorously

opposed to technology assistance. Anna explains that even within the enthusiastic

group of students, many of them are motivated by the opportunities to engage in social

networking or playing computer games. Anna explains it this way:

> They're so enthusiastic or jumping up and down. I think
> that for the majority of ones, even the ones who are
> happy to have it, they just want access to a computer:
> they just want access to, really, the internet or the Quick
> Pick games or things like that.

Anna's observation is supported by Anderson-Inman (1999), who discovered that

students who use technology for personal activities rather than school-related activities

are less likely to benefit from the accommodation. Anna describes the response of the

resistant group of students in this way: "there's the camp that doesn't want anything to

do with this and I've had students swear at me, cry." Anna expands upon this idea by

providing the following example of one student's response:

> I've had a young girl who said she would jump off the
> roof if I didn't get away from her with this computer. She
> didn't want to have anything: she said that "it's a stigma
> to have a computer, my friends call me names already.
> I don't want to touch this, I know what kind of kid get[s]
> these computers."

Stories such as this powerfully highlight the way that AT acts as a "stigma"

(Goffman 1963, p.1): from this student's perspective, the SEA laptop invoked feelings of

worthlessness and condemned her to an inferior status as emphasized by her quote, "I

know what kind of kid get[s] these computers." It is also clear that this student had no desire to associate with "the kid[s] that get these computers." Brown and Webster (2004) present a complex picture of the contradiction in the use of AT by highlighting that although the devices exist to resolve deficiencies, they also highlight the deficiencies. They further suggest that AT devices can be simultaneously enabling and wounding for users. Other researchers similarly suggest that AT devices are an external sign that appear to represent a symbol of incapacity, incompetence, and difference and may become the defining characteristic of an individual's status.

Susan similarly describes two types of responses to technology training. She expressed that on one hand, some students are accepting of the training because they are able to miss class. On the other hand, students that are resistant to training are generally resistant to receiving a SEA laptop. Susan explains it this way:

> Usually they like it because they get to miss class… the ones who would be the most resistant are the ones who are just resistant to getting the laptop. It's not a personal thing… they don't want the laptop therefore they don't want the training.

Although both AT trainers encountered student resistance to technology training, it was also apparent that they had difficulty separating students' response to technology training from students' response to getting a SEA laptop.

The two educators interviewed in this study agreed that they encounter students who either are enthusiastic about the difference the technology makes in their learning or want nothing to do with the technology. Both participants were in complete agreement that although assistive technology is a useful tool for students with specific

learning challenges, student response to receiving this accommodation has been mixed. Both educators describe their roles as encouraging students to embrace and use AT. Similarly to the observations shared by the AT trainers in this study, Donna expressed that students displayed mixed responses to AT. She relates that some students are enthusiastic and have become dependent on the technology. She describes these students' responses this way:

> There are some kids who eat it up. They are so excited,
> it made such a difference in their learning, and they
> don't know how they did it without it, and so if their
> laptop is on the fritz or something it's really a big
> problem.

Jane expressed a similar sentiment regarding students who have responded positively to AT. She explains students' responses this way: "'I wish I had that at an earlier age,' especially if it's a grade 11 or grade 12 student, they said, 'I wish I had it.' Because it makes a world of a difference, they can honestly see the difference it will make [in] how they learn."

Donna presents a breakdown of students' responses by expressing that 30% - 50% of SEA recipients respond positively to AT while the remaining 50% - 70% were either indifferent or opposed to AT. She further adds,

> Some of them love it and use it and it's wonderful. I
> would not say the majority though… if we were to divide
> it up it would be probably like a third to a half think it's
> fabulous.

She explained that among the group of students who respond negatively to AT, some feel stigmatized by the technology while others simply don't see the worth of AT. She describes the latter group of students' response this way:

> The others could take it or leave it because of the stigma… because as a learner they don't get excited about that kind of stuff, not because it's not worth it but because I think they just don't see the worth.

She expands on this idea by stating:

> There are some kids whose laptop[s] sit in my office and never leave here, and no matter what we do to try to get them to embrace the technology it does not happen.

Jane shared a similar observation that some students find the technology boring and require encouragement and reminders to keep using it. She explained it by mimicking the various debates she would have with students to encourage them to use the technology:

> I don't feel… I don't need it today, we encourage it, no, you need it… you may use it two weeks ago, you know, keep using it so the more you use it you will find out which program is really benefiting for you.

She further adds,

> If the teachers are not there to encourage them, for instance, they will come in and will say, "I need to write such and such." We'd say right away, "Use this program, use this program for that [task]."

Both educators' admission, that in their respective roles they encourage students to engage with AT, is a critical element in the level of acceptance of AT. This idea is overwhelmingly supported by several research studies that have long established that teachers play a pivotal role in the implementation of technology use in the classroom (Brosnan, 1998; Conlon & Simpson, 2003; Cuban, Kirkpatrick, & Peck, 2001; Mercer & Fischer, 1992; Schoefield, 1997). Other authors (Zhao & Frank, 2003) similarly report that when teachers have a positive attitude toward technology, they will encourage its use. The veracity of this idea is evident in Donna and Jane's positive responses and subsequent encouragement of AT use among students.

Both Donna and Jane share that they have been able to observe the tangible benefits of AT for some students. Donna feels that AT seemed to boost the confidence and abilities of some of the students that actively engage with it, since they are able to work more independently as a result of having the technology. She explains that,

> With certain kids for sure I know it boosts their confidence and all their abilities seem to grow because they have the technology. They're able to take notes in class and not feel like they're always asking for photocopied notes and things.

Jane similarly expressed that,

> Just being in the Special Ed room and using the technology with kids who I see can start out so very limited [in their] reading, and to see how much they excel because of the program makes a world of a difference.

This notion is supported by some researchers (Gersten & Woodward, 1990; Vaughn, Reiss, Rothlein, & Hughes, 1999), who have found that teachers will respond positively to technology if they are aware of the value of technology in their practice.

Based on the responses of parents, educators, and technology trainers to questions regarding students response to AT, it is clear that students perceive SEA equipment as negatively valued and stigmatizing in the way that it signifies their membership as part of a devalued group. Some researchers suggest that when people are treated adversely because of their affiliation with a group that is perceived negatively, their self-esteem is negatively impacted (Harris, 1995). Booth and Simons (1989); Jahoda, Markova, and Cattermole (1988); and Oliver (1986) provide some support for this notion. These researchers found that there is considerable evidence that one likely response from members of a devalued social group is to distance themselves from this group. This idea is played out in the way that SEA recipients respond to AT.

AT trainers and students were asked what students think is the purpose of computers in their education. Susan expressed the idea that students felt that they had computers for the purpose of gaming and social networking. Anna similarly stated that students did not see the computer as an educational tool but instead viewed its purpose as social. Anna explains it this way: "they don't think of it formally as an education tool, it's YouTube videos, games, and email and things like that."

Two of the student participants, Stephanie and Gary, expressed that the purpose of computers in their education was to help them to do research and complete homework. A third student, Christopher, explained that the computer compensates in

the way that he is able to use various AT programs in the organization and creation of

ideas. Christopher referred to the specific usefulness of particular programs in stating

that:

> I think it changes the way you see things… it
> compensates… If you are in a state of "I can't do this" or
> whatever mind set you are in, you have programs like
> Inspiration, which will help you storyboard or create a
> mind map of everything you have to do. It can help you
> with organization, with creation of ideas, and then you
> have something like Kurzweil, which will help you read
> back your notes to you, and then you have WordQ
> SpeakQ, which will help you write down your project
> from the notes.

Christopher further added that:

> All of this in a process together helps you not only get
> the work done but change the way you view yourself,
> your capabilities, and what you can get done.

Overall student responses were consistent with the findings of a large number of

studies that have shown that assistive technology enables students with learning

disabilities to perform tasks more efficiently and independently (Blackhurst, 2005;

Edyburn, 2005; Forgrave, 2002; Scherer, 2005; Duhaney & Duhaney, 2000; Garrison-

Harrell, Kamps, & Kravits, 1997; Mirenda, 2001).

AT trainers were asked the follow-up question, "What are students'

understandings of being given SEA computers?" Anna believes that students either

have no idea why they have a SEA computer or they have been told that they have a

LD and are ashamed of the diagnosis and further stigmatized by the laptop. Anna

describes students' understandings this way:

I think it's two-fold. Either they'll know nothing, so they won't know why they have the computer: I'll ask them if someone came in to talk to them, they'll say, "No, I don't ever remember that, I don't know why I have the computer." Then the other part is where the student knows that they have a learning disability or someone has said that they have a learning disability and they heartily disagree or they think that it's a stigma. That then they're ashamed of having the computer, and they don't want to touch it and I find personally that the older the student, there's kind of like a division where they get to a certain age and they just don't want to have anything to do with it, that they're nervous, they're ashamed. The younger ones are very excited.

Anna further explains that although younger students are excited about their SEA computer it was not so much for the educational benefits of having programs that will help with their schoolwork, but because they saw the computer as providing access to people or YouTube. Anna's observation that students are ashamed of having a SEA computer is supported by a common finding among researchers on the self-concept of people with learning disabilities, namely that they perceive the concepts of "mental handicap," "learning difficulty," and "learning disability" as devaluing and stigmatizing, and prefer not to identify with any such label (Booth & Simons, 1989; Jahoda, Markova, & Cattermole, 1988; Oliver, 1986). Other researchers similarly affirm the position that many people with learning disabilities do not attribute relevance to the LD label (Beart, 2005; Davies & Jenkins, 1997; Gillman, Heyman, & Swain, 2000; Harris, 1995). Although people with learning disabilities have the distinction of not being readily identifiable because their disabilities are not immediately apparent to others (Canary, 2008), SEA equipment poses a risk of making the presence of a disability known to others. Goffman (1963) succinctly describes this dynamic in suggesting that visibility is

central to the management of and reaction to a stigmatized social identity (Kaufman & Johnson, 2004; Quinn & Chaudoir, 2009).

In describing students' understandings of why they have a SEA computer, Susan expressed that: "I have had everything from 'I don't need this' to 'Oh, thank God.'" Susan expands this idea by suggesting that once students become aware of the reasons they have the laptop they appear more relaxed. Susan, however, describes instances in which the student's response is simply, "I don't know why I have a computer, my mother made me get it." Susan's latter observation is somewhat consistent with Anna's (the other AT trainer in the study) response that some students are completely oblivious of the circumstances surrounding them getting a SEA computer.

Students were asked how they would respond to the idea that it is "cool" to have their own laptop at school. Christopher responded that he considers it "cool" to have a laptop with programs that allow him to prepare presentations that "blow people away." Christopher also remarked that as students get older and laptops become more ubiquitous, having a laptop is not "as special or single as it was before." Stephanie expressed a similar sentiment that she considers it "cool" to have a laptop that allows her to do things at school that she previously could only do at home. She also felt that with laptops being so ubiquitous it is no longer a "big deal" to have a laptop at school.

John expressed that, at first, he was excited about the computer but as time went on, he found himself falling behind his peers because the computer slowed him down:

When I got it I felt like it was gonna work, like, help me out in school and everything, but as the days, as the months and everything go on it wouldn't work… kinda slowed me down… so I kinda stopped using it so I can catch up on work… at school there's only a time period for classes so it kinda slows me down.

Gary expressed that he was indifferent to the idea that it was cool to have a computer at school but added, "it's kinda stressful having to remember to take it [the laptop] everywhere I go." Patrick similarly felt that students pay a price for having a computer by having to carry the computer around: "well, if you're only using it for a period it's like you're paying to have it, to carry it around."

Students were asked if their peers questioned them about their SEA equipment and training. They were also asked to describe how they felt about those questions. Gary expressed that he was never questioned about his laptop, but further clarified that he "use[d] to have one"; when asked what happened to his laptop he replied, "I stopped using it." This response is consistent with John's response and Sandra's concern that her children had stopped using the technology. Several researchers (Scherer, 2004; Phillips & Zhao, 1993) similarly confirm that there is a high rate of abandonment of AT. When asked how he felt about questions related to his SEA computer and training, Patrick responded, "Sorta bad, I dunno, not bad." Christopher expressed that when he received his SEA laptop his peers were curious and would ask how he got the laptop and why the computer background displayed the name of the school board. Christopher admitted that although he felt awkward taking a laptop to school in grade 7, as he matured he was able to appreciate the benefits of being able to complete schoolwork quickly and have more neatly organized notes. He added that with laptops being more

socially acceptable in schools the computer became less of a problem and more of an asset. Stephanie expressed a similar sentiment that since many people use laptops in class she does not get questioned about her computer. She added that not many people are aware that she is an IEP student and explained that she is comfortable with her disability: if asked, she would explain to other students that because of the nature of her disability the laptop helps her to learn. Both Christopher and Stephanie's responses confirm researchers' findings that AT enhances independence, increases learning opportunities, and improves students' self-esteem through increased productivity (Duhaney & Duhaney, 2000; Garrison-Harrell, Kamps, & Kravits, 1997; Mirenda, 2001).

At the time of the study, Christopher was completing grade 12 and Stephanie was completing grade 11. Both students expressed an interest in attending university after high school. What is interesting in this study is that both Christopher and Stephanie appeared to be highly motivated students and as such they valued AT as a tool that would help them achieve their academic goals. Both students' responses are consistent with the findings from Anderson-Inman's study of the issues affecting the efficacy of computer-based solutions for students with learning disabilities. In this study, Anderson-Inman (1999) suggests that student motivation to succeed in school is an important variable affecting how students with learning disabilities respond to technology assistance. Anderson-Inman also established that although the computer is motivating to many students, its interest value alone is not sufficient in the long run, especially because not every student is motivated to succeed in school. However, it would be premature to assume or conclude that students who appear less-than-enthusiastic about AT are unmotivated to succeed in school.

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The following tables provide summaries of students' responses to AT from the perspectives of parents, teachers, trainers, and students.

Table 3: Summary of Parents' Comments on Students' Responses to AT

Participants	Responses to AT	Reasons for Responses
Sandra	"Their response to technology assistance within the school setting has not been good."	"I feel it comes from… that feeling of being separate from and identified as being kind of different from the norm in the classroom."
Sandra	"I think they arrived at HS and the computers followed them shortly thereafter and they've stayed in the cupboards collecting dust."	"They don't like being centered out and having a unique or specific need that's not kind of the same for others. So that technology then becomes like a red flag, "oh here I am and I have all these differences and so I need to have something special to work on"… all have felt centered out and stigmatized by it."
Maureen	"I think he is glad to have it."	"He was never embarrassed to use it."
Sandra	"I'm seeing now even in Grade 5 that the attitude around not wanting to use the technology in the classroom is	"Because it centers her out… It's not normalized." "What will happen in the classroom? It will be comments like, 'Oh, Shelly's got a computer, why does Shelly have a

	certainly there."	computer in the classroom?' and then Shelly starts to feel more and more embarrassed, and more and more ashamed."

Table 4: Summary of Students' Responses to AT		
Participants	Responses to AT	Reasons for Responses
Christopher	"I think it changes the way you see things… it compensates."	"If you are in a state of 'I can't do this' or whatever mind set you are in, you have programs like Inspiration, which will help you storyboard or create a mind map of everything you have to do. It can help you with organization, with creation of ideas, and then you have something like Kurzweil, which will help you read back your notes to you, and then you have WordQ SpeakQ, which will help you write down your project from the notes."
Christopher	"Having a laptop is incredibly cool."	"Because I'm able to do things that you know… people [are] like, 'Whoa… what's he doing?' … I can also be more organized… and laptops became more socially acceptable in schools."
Stephanie	"It's cool to have a laptop."	"Because it allows me to do so many things that, if I didn't have it, I could only do at home… a lot of people use laptops in

		class so it's not weird to see me use a laptop, it's just like I brought a laptop to class."
John	"When I got it I felt like it was gonna work, like, help me out in school."	"As the days, as the months and everything go on it wouldn't work… kinda slowed me down… so I kinda stopped using it so I can catch up on work."
Gary	"It's kinda stressful having to remember to take it [the laptop] everywhere I go."	
Patrick	"Well, if you're only using it for a period it's like you're paying to have it, to carry it around."	

Table 5: Summary of Teachers' Comments on Students' Responses to AT		
Participants	Responses to AT	Reasons for Responses
Donna	"There are some kids who eat it up."	"They are so excited it made such a difference in their learning and they don't know how they did it without it."
Donna	"Some of them love it and use it and it's wonderful."	
Donna	"The others could take it or leave it."	"Because of the stigma… because as a learner they don't get excited about that kind of stuff, not because it's not worth it but because I think they just don't see the worth"
Donna	"There are some kids whose laptop[s] sit in my office and never leave here, and no matter what we do to try to get them to embrace the technology it does not happen."	

Jane	"'I wish I had that at an earlier age.'"	"Because it makes a world of a difference, they can honestly see the difference it will make [in] how they learn."

Table 6: Summary of AT Trainers' Comments on Students' Responses to AT

Participants	Responses to AT	Reasons for Responses
Anna	"They're so enthusiastic or jumping up and down."	"For the majority of ones, even the ones who are happy to have it, they just want access to a computer, they just want access to, really, the internet or the Quick Pick games or things like that."
Anna	"There's the camp that doesn't want anything to do with this and I've had students swear at me, cry."	"She said that 'it's a stigma to have a computer. My friends call me names already. I don't want to touch this I know what kind of kid get[s] these computers.'"
Susan	"Usually they like it."	"They get to miss class."
Susan	"The ones who would be the most resistant are the ones who are just resistant to getting the laptop."	"They don't want the laptop therefore they don't want the training."
Anna	"They don't think of it formally as an education tool, it's YouTube	

	videos, games, and email and things like that."	
Anna	"They just don't want to have anything to do with it, that they're nervous, they're ashamed."	"There's kind of like a division where they get to a certain age."
Susan	"I have had everything from 'I don't need this' to 'Oh, thank God.'"	
Anna	"I think maybe that's why the computer's so threatening."	"It's because it's a physical representation of their learning disability."

Summary

Based on a summary of participants' responses presented in the aforementioned tables, it is evident that there is a marked degree of divergence in students' responses to AT. Of the five student participants in the study, two responded positively to AT and even admitted to being thankful for the accommodation. These two student participants had several things in common. Firstly, both students express the idea that it is "cool" to have a laptop with AT programs because it allows them to "work around" areas of particular challenges. Secondly, these two students offered the perspective that they did not perceive having SEA laptops as "special" or negative because they are ubiquitous among secondary students. Thirdly, Christopher and Stephanie's commitment to AT is

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evident in the way they are able to provide specific examples of AT programs they find beneficial. Finally, Stephanie and Christopher's positive engagement with AT appears to be driven by their commitment to use AT as a compensatory alternative.

The other three student participants' (Gary, Patrick, and John) responses ranged from indifference to frustration, either because the technology did not meet their expectations or the idea of having to take their laptop everywhere proved to be stressful. An interesting observation relates to the limited responses that these students provided with regards to their specific use of AT. Another common outcome among these three students is their limited use and eventual abandonment of their SEA equipment.

Although both parent participants advocated for SEA computers for their children, it is interesting to note the huge discrepancy in their children's responses to AT. One parent (Maureen) expressed that her son was glad to have AT, while Sandra explained that her children felt stigmatized and centred out by the special nature of AT, causing them to abandon their SEA equipment.

The preceding tables highlight inconsistencies between Sandra's reasons for her children's disengagement with AT and student participants' reasons for abandoning their SEA equipment. This opens up two possibilities. First, if these students felt centered out by their SEA equipment, would they be willing to admit to feeling stigmatized? Secondly, do students feel comfortable talking about stigma the way adults do? In other words, is stigma a part of teenage discourse?

Susan and Anna (AT trainers) provided useful insight into the range and degree of particular responses to AT. The trainers clarified that although some students appeared enthusiastic to have a SEA computer, their enthusiasm had less to do with using AT for schoolwork and more to do with non-school-related activities such as social networking. Both trainers also made similar observations regarding resistance to AT being because students felt stigmatized by it.

The educators (Jane and Donna) highlight two distinct responses to AT. On one hand, some students embraced AT because of tangible positive outcomes, while on the other, some students were either indifferent or resistant to using AT primarily because of the stigma.

Chapter 5: What the Diagnosis of a LD Means to SEA Students and Their Parents

> It's a definition to me that I can both benefit from and at
> the same time, just from the social environment, I do
> get hurt from time to time. (Student participant
> Christopher, 2010)

The question of whether a diagnostic label helps or hinders the labelled individual (Osterholm, Nash, & Kritsonis, 2007) is critical to understanding their engagement with the label. For instance, what is the individual's understanding or perception of a particular label? How do they identify with this label? The question of what the diagnosis of LD means to students and the extent to which this understanding is part of their identity is likely to impact how they make sense of their educational experiences.

In order to explore this research question, a review of the dominant approaches to disability from a critical disability perspective is fundamental to understanding the complex nature of negotiating a disability identity. The traditional medical model of disability views disability as a disease or personal deficit, and locates the problem of disability within the individual (Oliver, 1996). This model produces a negative valuation of disability that powerfully constructs an oppressed identity for people perceived as having a disability. Rose (1995) similarly suggests that the medical pathology model of disability is "the source of many cultural conflicts about people with disabilities because it stigmatizes them as defective and abnormal" (p. 225).

The social model of disability draws substantially on a "social constructionist" perspective that is centrally concerned with meaning and, in particular, the importance of learning from the experience of those with disabilities to understand meanings of

disability (Oliver, 1996). The social model of disability provides a paradigm or conceptual framework for understanding disability by recognizing that people have physical, sensory, cognitive or psychological differences that dictate how they function in society. This model separates disability from impairment and views disability as socially constructed. In other words, individuals with impairments are not disabled by their impairments but by the environmental, economic, and cultural barriers that exist in society and do not take their needs into account. Prejudice is associated with the recognition of difference, and persons with disabilities are not seen as normal in the eyes of "non-disabled" people (Swain, Finkelstein, French, & Oliver, 1993). Harris (1995) similarly suggests that devalued stereotypes of disability have resulted in people with disabilities assuming various identities, including those of adopting the stigma of disability, reflected in low self-esteem, or of preserving self-esteem by identifying with non-disabled peers. Harris further posits that segregated services reinforce difference by making people with LD easily identifiable.

Parents and students were asked about their understanding of the diagnosis of a learning disability. Similarly, trainers and teachers were asked to describe students' responses to being identified as having a LD. The majority of responses suggested an awareness of the stigma and negative connotation of the learning disabilities label.

From her background as a psychologist, Sandra provided a clinical explanation of the diagnosis as being:

> An impairment in their processing capacity in whatever area… my eldest daughter who has a pronounced reading disability that also kind of got mired into a writing disability. My next one was a very strict writing

disability/writing impairment, and my youngest is a little
bit of a combination of things.

Sandra further explains that her children's response to having a LD is reflected in what she calls "frustrations that they have managing the classroom environment." When asked who explained the diagnosis to her children and how it was explained to them, Sandra explained that the diagnosis was explained by the testing facility and her. She added that she chose the term "learning struggles" in explaining the diagnosis, because "disorder" sounds too clinical and "disability" is too much of a label.

Goffman (1963) argued that disability is a form of stigma and a discrediting label that ascribes negative characteristics to the individual: what he calls a "spoiled identity." Sandra made reference to the fact that in her capacity as a psychologist she is often asked by parents how they should talk about the diagnosis of LD with their children. Sandra said, "I often talk about challenges and strengths: that's the best way to do it because we all have them and it normalizes it." Sandra's intentional choice of the terms "challenges and strengths" in place of "learning disability" is consistent with researchers' (Canary 2008) view that diagnostic labels hold no importance for families, since they tend to concentrate on their children's abilities and weaknesses. Other researchers (Sutcliffe & Simmons, 1993; MacMaster, Donovan, & MacIntyre, 2002) similarly argue that people with learning disabilities view categorization and labelling as stigmatizing, leading to feelings of exclusion. This position is also affirmed by Gillman, Heyman, and Swain (2000), who assert that "many labels signify memberships of groups devalued by society and impose a stigmatized identity on the individual" (p. 395). It appears that a certain stigma surrounds the term "learning disability." This is largely attributed to the

larger stigma associated with disability in general (Harris, 1995). Several researchers (Oliver, 1983, 1990, 1996; Barnes, 1991; French, 1993; Oliver & Barnes, 1998) argue that segregated or special services in education cause children with disabilities to have a negative self-image and a "second-class" identity. Sandra's decision to carefully avoid use of the term "learning disability" is an indication of an awareness of the socially demeaning, negative, and pervasive stigma that the term learning disability carries. Sandra's explanation, that the terms "challenges and strengths" normalize a student's struggles, further reflects the problematic interpretation of the relative worth of individuals labelled as having a LD.

Maureen expressed the view that the diagnosis of LD means that her son learns differently and, as such, he needs to approach things differently. The notion that her son "learns differently" and "is not stupid" – it is not that he "cannot learn" – seemed to underlie her comments. For example, in explaining what the diagnosis of LD means to her Maureen commented:

> Kevin can understand that… he is not stupid, he has a different learning style… and by having that diagnosis… it allows him to better understand that he needs to have things done differently for him. It's not a negative thing, it's a positive thing and that everybody learns differently. You have something that makes you need… to have a different approach to learning. It doesn't mean that he cannot learn, it just means that he has to approach it differently.

Maureen's response reflects the normal/abnormal dichotomy (Gillman, Heyman, & Swain, 2000) that is central to the tensions between the label "learning disability" and students' responses to this label. Maureen's statement that "he is not stupid… It doesn't

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mean that he cannot learn" reflects her need to respond to the negative evaluations of people with intellectual disabilities that abound in society (Craig, Craig, Withers, Hatton, & Limb, 2002; Albinger, 1995; Osterholm, Nash, & Kritsonis, 2007). Beart (2005) supports this notion in asserting that "people with learning disabilities are defined as such by others because they differ from a culturally defined idea of "normal" intellectual functioning" (p. 128). Several researchers (Altman, 2001; Linan-Thompson & Jean, 1997; Taylor, 2000) affirm the view that the complex, socially constructed nature of the term "disability" lends itself to assumptions about the capacity of individuals with disabilities.

What is interesting in this study is that although Sandra and Maureen articulated their responses to the question of what it means to have a LD in different ways, their responses reflected an awareness of the negative effects of the LD label. Although Sandra's response reflected a clinical understanding of the LD diagnosis, her response also reflected an awareness of the social implications, burdens, and risks of the label. Maureen provided a similar response that addressed the subtleties in perceptions once an individual is assigned the LD label. It was very apparent in this study that Sandra and Maureen were less concerned about the label of a LD and more interested in how the diagnosis would provide accommodations for their children's needs. Both parents' attitude toward their children's diagnosis of LD appear to run counter to the popular belief that "parents of adolescents with learning disabilities had lower academic expectations for their children than did parents of normally achieving adolescents for theirs" (Hiebert, Wong, & Hunter, 1983). Both Maureen and Sandra admitted to initiating and advocating for their children to have their assessments completed, resulting in their

receiving SEA computers. Sandra and Maureen's involvement is supported by several

researchers (Gillman, Heyman, & Swain, 2000; Edyburn, 2005), who have found that

some families' involvement in technology decision-making is motivated by their

children's ability to gain access to resources and services. These researchers also

suggest that students who access AT have very involved parents who advocate for

these services.

Student participants were asked what the diagnosis of a LD meant to them.

Christopher's response reflected obvious tensions between personal empowerment that

comes from receiving special accommodations and the negative effects of social

labelling. As noted above, he puts it this way:

> It's a definition to me that I can both benefit from and at
> the same time, just from the social environment, I do
> get hurt from time to time.

Christopher further explained that people's unfamiliarity with what a LD is can be very

problematic and painful for individuals with this diagnosis. Even though Christopher

indicated that he sees the benefits of being identified with a LD, he admitted that being

classified as such comes with hurtful experiences. Christopher vividly expressed the

frustrations experienced by some students with LD by referring to an incident involving a

schoolmate with a LD diagnosis. Christopher relates it as follows:

> There was another girl in my class who has more
> pronounced LD and… behavioural features, and one
> day I was walking to class with someone else who is
> also in my class and someone came up to this other
> boy and said, "Oh hey, you have that crazy girl in your
> class," and that really struck me because this girl isn't
> crazy, she's very well-mannered, very friendly, and

that's the social side of it, when you see ignorant people
who don't understand anything about both you or what
a LD is.

Critical reflection and analysis of Christopher's comment reveals several

disturbing stereotypes, social attitudes, mischaracterizations, and misconstructions of

individuals with LD and disabilities in general. In addition to being marginalized and

maligned as a result of a LD, the student is referred to as "crazy" in a derogatory

manner. In an attempt to defend the student, Christopher innocently juxtaposes being

"crazy" with "well-mannered" and "very friendly," which indirectly suggests that

individuals who are "crazy" are not well-mannered and/or friendly. By the same token,

the comment suggests that being well-mannered and very friendly are attributes of

individuals without disabilities. The comment also reflects the double stigma of being

diagnosed with LD and unfavourable assumptions about an individual's personality and

overall character. Recent research on bullying and students with disabilities reveals that

students with disabilities are often at greater risk of bullying and victimization than their

non-disabled peers (Rose, Swearer, & Espelage, 2012; Swearer, Wang, Maag,

Siebecker, & Frerichs, 2012). Though well-intentioned, comments like Christopher's

reflect a normalizing and acceptance of inappropriate comments toward and treatment

of individuals with disabilities.

Christopher's account of this incident confirms the position that oftentimes

students will need to contend with individuals who do not understand what it means to

have a learning disability (Campbell-Whatley, 2008). The author further suggests that

students, teachers, and parents lack a general awareness of the needs of individuals

with LD. Christopher describes the tension of having the LD diagnosis as being hurtful

socially but very helpful at the same time. Christopher expressed the tension this way:

> On the other hand, there is the personal understanding
> whereas you are able to understand your own LD, and
> instead of being angry at yourself because of it you are
> able to understand what it means and how you can
> work around it, so not only does knowing about it help
> you but it helps you in defending yourself against others
> who may not know anything about it… so being
> identified with a LD can be very bad to yourself
> socially, but at the same time if you accept it and you
> work against it, it's very, very helpful to have that
> identification.

Several authors (Gillman, Heyman, & Swain, 2000) address the inherent

tensions in the access of students with LD to resources. The authors suggest that

whereas on one hand, the LD label is unwanted and results in undesirable treatment, on

the other hand, the label provides access to resources. Christopher's admission, "being

identified with a LD can be very bad to yourself socially, but at the same time if you

accept it and you work against it, it's very, very helpful to have that identification," is a

fitting example of the dilemma that students with invisible special needs such as a

learning disability are confronted with. Although Christopher highlighted the importance

of students' understanding of their LD in order to work around their area of need, deFur,

Getzel, and Trossi (1996) assert that many students lack adequate understanding of the

characteristics of their disability or the advantages of appropriate services, instead

concealing their disability to escape the stigma and labelling affiliated with special

education.

Stephanie explained that knowing that she has a LD has allowed her to understand why she struggled with certain academic tasks. Stephanie remarked, "Knowing that I have a learning disability, it makes me understand that there is actually a reason that I'm not understanding things." Stephanie further explained that being formally identified as having a LD provides her with helpful resources such as AT and greater access to teachers to have questions answered and information clarified. Stephanie's response confirms what a number of studies have shown: that assistive technology enables students with learning disabilities to perform tasks more efficiently and independently (Blackhurst, 2005; Edyburn, 2005; Forgrave, 2002; Scherer, 2005). Although Stephanie has not articulated any negative experiences resulting from her diagnosis of a LD, both Stephanie and Christopher consistently recognize the benefits of being identified with a LD and the importance of understanding the identification.

Another student participant, Patrick, expressed that the diagnosis of a LD simply meant that, "I just get extra time… that's it." Even when the question was repeated, Patrick was unable to expand on his understanding of a LD diagnosis. Although Patrick was unable to articulate an understanding of the diagnosis of LD it is interesting that, like Christopher and Stephanie, he made reference to the benefit of being given extra time. When asked why he thinks he was given a SEA computer Patrick stated, "To help me with English." Patrick's limited explanation and apparent limited understanding of his disability are supported by several studies. Jones (2006) highlighted that in an attempt to teach students about their LD, teachers were surprised to find out how little students actually knew about their disabilities; even more troubling were their self-perceptions of

being "dumb, stupid, and lazy." Other researchers similarly found that students were either unable or reluctant to discuss their disability (Abernathy & Taylor, 2009).

In her capacity as an Educational Assistant (EA), Jane is immersed in the lives of students using SEA equipment in her school. Many of these students have been formally identified as having a LD. When asked how students feel about the diagnosis of a LD, Jane expressed that when students first learn about their diagnosis they feel "set apart" and express the idea that they are "dumb." Several researchers (Kozulin, Gindis, Ageyev, & Miller, 2003) suggest that a person's sense of identity is ultimately affected by what is valued within their society and culture. Since academic prowess is highly valued in our society, any perceived inability to acquire "acceptable" levels of academic performance is likely to negatively affect an individual's self-perception. For instance, Jane remarked that,

> A lot of students, when they hear that they have a
> disability at first, it's like… they feel like they [are] set
> apart. "Oh, I am different," or, actually, "some kids will
> say I am just dumb."

It becomes apparent that students identified as having a LD are not only aware of, but have also internalized, the negative evaluations and perceptions that others hold of them. Jane's observation of students' responses is consistent with researchers' findings that many people with learning disabilities do not relate positively to being labelled as such and do not consider this label to be a significant part of their character (Beart, 2005; Davies & Jenkins, 1997; Gillman, Heyman, & Swain, 2000; Harris, 1995). Harris (1995) similarly affirms that concepts of disability are thought to have negative consequences for people with disabilities arising from overgeneralization and negatively

valued stereotypes or prejudices about their relative value. The notion of students' negative self-perception is similarly supported by Burden (2008), who asserts that as young people mature physically and intellectually, their feelings of proficiency and well-being are shaped through social comparisons between themselves and others, and their interpretation of others' perceptions of them.

Students' feelings that "some kids will say I am just dumb" are a reflection of the importance of being positively viewed by peers. As previously established, a student's self-concept is shaped by the image that parents, teachers, and peers have of them (Bear, Minke, & Manning, 2002; Elbaum, 2002; Schmidt & Cagran, 2008), in addition to their evaluation of themselves relative to their peers in similar settings (Möller, Streblow, & Pohlmann, 2008), thereby explaining part of the challenges that students with LD have in accepting and understanding the LD diagnosis. As discussed above, Möller et al. further suggest that learning difficulties have an adverse effect on students' academic self-concept, a finding confirmed by other studies (Chapman, 1988; Crabtree & Rutland, 2001; Albinger 1995; Stone & May, 2005; Elbaum, 2002). A common finding among researchers on the self-concept of people with learning disabilities is that they perceive the concepts "mental handicap," "learning difficulty," and "learning disability" as devaluing and stigmatizing, and prefer not to identify with any such label (Booth & Simons, 1989; Jahoda, Markova, & Cattermole, 1988; Oliver, 1986; Macmaster, Donovan, & MacIntyre, 2002).

Jane further explained that,

> We make the classroom so comfortable and [encourage
> the] feeling that "it's not that I'm dumb, it's not that I am

set apart, but you know what, it's just a classroom setting where [a] few of the kids come with the same learning disability." They encourage each other, and they most of all [get a] feeling, a sense that it's the communications classroom, it's like going to an English classroom, it's just another classroom, it's not separate, as if, like, only dumb kids come to this classroom.

Green, Davis, Karshmer, Marsh, and Straight (2005) further support this notion in stating that "people with disabilities… are generally perceived to possess traits that others do not want to acquire" (p. 202). Scherer (2004) similarly suggest that individuals with disabilities are stigmatized as being less intelligent and incapable of success compared to their non-disabled peers. Stigma also has a large effect on self-perception and academic performance. It is evident that these students have constructed a negative view of themselves based on their membership in a devalued group. It is also likely that, based on students' view of themselves, their reaction to the label of LD has become woven into their self-concept. Jane's description of the communications room as "just a classroom setting where [a] few of the kids come with the same learning disability" is a reflection of the subtle acceptance of the "special" or segregated nature of the special education room as a "safe" space shared by students with a common difference. This idea of "separateness" has implications for the ways that students make sense of their experience as students with a LD within the wider school setting.

As previously mentioned, several studies have shown that people in negatively valued social groups often have lower self-esteem than others. There is also considerable evidence that one likely response of members of a devalued social group is to distance themselves from this group (Booth & Simons, 1989; Jahoda et al., 1988; Oliver, 1986). Jane's response highlighted a common theme that resonated throughout

the answers to this question: individuals are stigmatized by the LD label. Educators such as Jane's well-intentioned attempts to create a space where students feel that they belong may in fact be reinforcing the stigma that these students experience. Some researchers (Craig, Craig, Withers, Hatton, & Limb, 2002) aptly suggest that stigma has a significant impact on individuals with disabilities, and service providers play a part in preserving stigma by either being complicit or denying its existence.

Both AT trainers, Susan and Anna, expressed the opinion that some students appear to be "in the dark" regarding the diagnosis of a LD. Both AT trainers see a direct correlation between students' unawareness of their disability and lack of knowledge regarding why they have a SEA laptop. Susan expressed the belief that some students are very good at describing their disability and oftentimes these students have learned to self-advocate. Susan further explained that other students appear to go through the motions of the assessment, receive a SEA laptop, and are still unsure of what is happening. Susan describes both sets of students this way:

> I have some kids who are very good at describing their
> learning disability and why they would need this, and
> "gosh, it helps me so much," and you know. So those
> kids, I guess because they have learnt to self-advocate,
> they have learn[t] to, "OK, look, you just learn
> differently, this is what we are going to do to help you
> learn. Other students, I think they just go through the
> motions of all the testing and everything else, and "My
> mom says I am getting a computer and now I have a
> computer," and they [are] kinda a little bit in the dark.

Susan's observations are supported by Abernathy and Taylor (2009), who assert that parents of students with disabilities at the elementary and middle school levels are usually the ones that make decisions regarding their education. The authors further

suggest that even as these students get older, parents continue to make decisions for them. Susan points out that students who are able to describe their disability are usually receptive of AT and have an understanding of the difference AT will make in their academic life. Susan further expressed a connection between students' knowledge of their disability and their ability to self-advocate within the school environment. Susan's observation is strongly echoed by Abernathy and Taylor (2009), who suggest that when students have an understanding of their disability they are better able to self-advocate for services that can support their disabilities. Since LD is an invisible special need, the onus is often on the student to disclose the disability.

Based on Susan's observations it is conceivable that students with an understanding of their disability might be more inclined to "own" their disability, in order to access necessary supports. Anna agrees with Susan's observations, citing that "a lot of them will say they don't know. Like I said before, they don't know why they have the computer." Anna further explained that,

> It's actually very rare… where the students think they
> have a learning disability, or it could be because they're
> in a separate class: sometimes that's the big thing for
> them, like, "Well, I'm in this class so maybe there's
> something wrong or maybe… I'm a little bit different." In
> many cases they're not able to speak to it.

Anna and Susan's observations of students' unawareness of a LD diagnosis are consistent with Abernathy and Taylor's (2009) finding that individuals with learning disabilities are often unsure of what their disabilities are, and even of how their disabilities affect their academic and social lives. These researchers also conclude that many students with disabilities not only lack knowledge of their disability but also

oftentimes do not even know they have a disability. Other researchers (Rodis, Garrod, & Boscardin, 2001) point out that some adults with learning disabilities reported that they had no idea that what was "wrong" with them had a name.

Anna specifically pointed out that it was very rare for students to think or accept the idea that they have a learning disability, saying "If they do, a lot of them will say they don't know." Similarly, Sandra talked about her son's reluctance to accept a disability diagnosis as part of his identity. Sandra describes her son's response this way:

> My son is the one who is most stubborn about this…
> "This isn't me… what are you talking about?" … he
> understands that it is tricky for him to write… he wants
> nothing to do with a disability diagnosis at all… he owns
> that's not a strength, he really struggles with it… it's just
> kind of a part of his identity, but not completely.

Anna makes a distinction between students' not knowing that they have a learning disability and students not thinking or accepting that they have a LD. Based on Anna's observation there is also the possibility that some students might know they have a LD but may choose to say they don't know. Similar to Anna's observation is Sandra's description of her son's response, suggesting that he falls in the category of knowing but not accepting a LD diagnosis as part of his identity.

Anna's observation and Sandra's description of her son's response are supported by research that confirms that many people do not consider the label "learning disabilities" to be important to who they are (Beart, 2005; Davies & Jenkins, 1997; Gillman, Heyman, & Swain, 2000; Harris, 1995). Anna points out that in order to determine students' specific needs or challenges she usually has to ask probing

questions such as, "So, how are you with spelling? Do you find that you misspell words a lot?" or "Is it math or is it words? Or is it spelling or is it writing?"

What is interesting in this study is that although students will admit to struggles in different academic areas, they are not apparently willing to "own" or talk openly about the learning disabilities label. The label itself appeared to be too humiliating to be admitted or mentioned.

Summary

Maureen and Sandra provide very different descriptions of what it means to have a learning disability. Maureen's responses reflected an understanding and acceptance that her son learns differently and has to employ compensatory strategies and tools to negotiate the academic environment. Her responses are classified as social model because they reflected a pragmatic approach to getting her son to find other ways to get things done, instead of a preoccupation with the LD label. Obvious tensions exist between Sandra's decision to adopt language that normalizes disability (social model orientation) and the description of her children's responses to the LD label (medical model). A social model approach is particularly evident in Sandra's intentional use of the terms "challenges and strengths" in place of learning disability in her clinical practice. An internalization of the medical model approach is reflected in Sandra's son's refusal to assume a disabled identity.

AT trainers' description of students' responses to the LD label overwhelmingly reflect a medical model approach to disability. Trainers' descriptions of students' responses that fall in the medical model category range from outright denial of any

knowledge of a LD diagnosis to intense refusal to use any accommodation that will make them appear different. A social model response is reflected in trainers' descriptions of students who are able to comfortably describe their learning disability and make connections between their learning challenges and AT tools.

Students' responses were almost evenly split between the medical model and the social model approaches to disability. It is worth noting that although Christopher has an understanding of his LD and feels comfortable talking about it, the majority of his responses fit within the medical model category. Further examination of Christopher's responses reveals that although he feels empowered by the diagnosis of a LD and its attendant accommodations, he also recognizes the negative social effects of being labelled with a LD. For example, Christopher made several references to people's obliviousness or negative reactions to persons with disabilities. These comments are consistent with a medical model approach. The majority of Stephanie's responses reflected a social model approach and confirmed the view put forward by the AT trainers, that students who are able to speak comfortably about their disability are also able to make connections between their learning challenges and tools that will help them meet their academic goals.

From the preceding discussion, it is worthwhile noting that the majority of participants' responses revealed a medical model approach reflected in self-deprecating comments, negative self-evaluation, and repeated indication of internalized stigma. The bulk of educators' responses are consistent with a medical model approach on the part of students. Educators' responses illuminate significant insights about students' perceptions of AT as stigmatizing, and further reflect students' internalization of

negative assumptions about persons with disabilities as evidenced by students'

repeated use of the word "dumb" in describing themselves.

Chapter 6: The Particular Experiences and Contexts within which Students Who Access Technology through SEA Are Trained

> It depends on how the school integrates the technology.
> Are the students put in a separate room? … or are the
> kids in the classroom with the rest of their peers using
> the technology and the other kids want to figure out how
> they can become part of that? (AT trainer participant
> Anna, 2010)

It is increasingly critical to examine the contexts within which education of

students with disabilities take place. This is particularly important given the variety of

environments in which such students are educated. In the Canadian context, most

students with disabilities are educated in environments that lie on a continuum between

two extremes (Roeher Institute, 2004). On one hand, some students are educated in an

inclusive environment that embraces students who may have intellectual, physical,

learning, sensory or other kinds of disability (Bunch, 2002). On the other hand, students

with disabilities are placed in segregated learning environments based on educational

experts' views on what is deemed to be in their best interest (Roeher Institute, 2004).

The latter approach creates particular challenges for some students, and these

challenges are especially complex for students who access technology through SEA

funding.

Within the province of Ontario, some students with disabilities requiring

technology assistance are provided with supports through SEA funding. SEA funded

equipment requires supporting documentation, including an assessment by a qualified

professional and an Individualized Education Plan (IEP). The idea that SEA funded

equipment is associated with specialized support to address the functional limitations of a disability is a barrier for students accessing this service. In order to appreciate the experiences of these students, it is important to examine the particular contexts in which they access AT services.

In this study, parents, students, teachers, and trainers were asked several questions related to the delivery of SEA training in schools. Students were specifically asked to describe what it is like to have their own (SEA) computer equipment at school. Christopher (the 18 year old student who is very accepting of AT) explained that it was very helpful to have the technology available both at home and school. He explained it this way: "I'm able to access my work here and at home, and access the tools I need here and at home." In response to the follow-up question, "How did you feel about getting your computer training at school?" Christopher expressed that it was definitely interesting and helpful for him to receive training at school. He further stated that getting training at school allowed him to be in a position to help other students and teachers with the AT programs.

When asked if other students ever ask about his SEA laptop and training, Christopher stated that initially students were curious and would ask, "Why does that background say [the school board name]? What is this? How did you get this?" He further expressed that students and teachers would frequently ask about his training and come to him for help. Christopher expressed that "I really wish the training was available to everyone and, unfortunately, that's not the case." This comment reflects the special/segregated environment within which SEA students are trained. Christopher

points out that it is not uncommon for students to use the AT and equipment in the communications room.

When asked how he felt about questions pertaining to his SEA training and equipment, Christopher explained that when he received his SEA laptop in grade 7 it was very awkward for him because no other student had one. He further explained that as he matured and computers became more socially acceptable, it became less of a problem and more of an asset to have a laptop at school. Christopher explained it this way:

> I have been bringing a laptop to school since about grade 7. It was awkward, and bringing a laptop to school when no one else had one but… I often remind myself that with this I can get work done a lot faster than they can, I can have a lot neater notes than they do, and I can also be more organized, and as I matured and they matured and laptops became more socially acceptable in schools, it really stopped being a problem and started being a major, major asset that help[s].

Several authors (Kintsch & DePaula, 2002; Scherer, 1996) suggest that in order for an AT user to be successful they must possess certain attributes. These include self-discipline and high frustration tolerance, willingness to incorporate tools into daily routines, being proud to use the tools, and a desire for change in what they can do. The authors also suggest that in order to be successful, users must feel competent, have opportunities to use the assistive tools, and feel that the device has enhanced their life. Based on Christopher's responses, it is evident that he possesses the attributes described above and, as a result, he is highly motivated to use AT.

In responding to the question of what it was like to have her own laptop at school, Stephanie admitted that having a SEA laptop at school was very helpful because it prevents her from having to duplicate her efforts, since she is able to do her work on the computer instead of doing it at school and then at home. She added that she is also able to access resources such as the internet, specialized programs such as Kurzweil, and other programs while away from home. Stephanie suggested that she is able to work more efficiently instead of waiting to do certain tasks at home.

Patrick similarly expressed that having a laptop at school helped him to manage tasks more efficiently, rather than having to save work in several places. Patrick stated:

> It helps me to do homework and stuff at school… it allows me to save everything under the one computer, instead of having to save it on my computer and then, like, send it to chat and stuff to get it here.

Gary (the student that stopped using his laptop) expressed ambivalence toward having a SEA laptop by stating that although it is good to have his own computer, it was also stressful having to remember to take it everywhere he went.

John (the student who stopped using his computer because it slowed him down) expressed that although the computer can sometimes be helpful, at other times it causes him to fall behind his peers, forcing him to resort to writing. John repeatedly mentioned that the computer considerably slowed his work. He expressed it this way:

> Sometimes it's helpful, sometimes it's not really helpful, it cuts me down… it slows me down when I'm doing work so I am behind everybody when I use a laptop, but when I write I keep up with everybody so it slows me down a lot.

It is interesting to note that initially, John mentioned feeling optimistic that the computer

would help him with schoolwork but became disenchanted when he started falling

behind. He explained that,

> When I got it [the SEA laptop] I felt like it was gonna
> work, like, help me out in school and everything, but as
> the days, as the months and everything go on it
> wouldn't work… kinda slowed me down… so I kinda
> stopped using it so I can catch up on work.

John provided further insight into what might be a barrier for many students' lack of

engagement with SEA laptops, in suggesting that his computer took a long time to start

and was very slow. He expressed his feelings this way:

> Like when I'm at home and I use my computer at home
> I can go faster 'cause I have all the time I need to do
> the work, but at school there's only a time period for
> classes so it kinda slows me down… I didn't like that
> when I started: it takes forever to start and I could
> already be halfway done.

John added that "if it were faster then I might use it. That's the main thing: it's gotta be

faster. One of my pet peeves is I don't like slow computers." When asked if he would

consider using the software on his laptop if the issue of speed was resolved, John

responded,

> If it were faster it would probably help me a little bit
> more… if it made me go faster, but it would still slow me
> down 'cause I'm not a fast type[r] as I am a writer. So it
> would still slow me down, but it would also be good if it
> was quicker to start up.

Given the high rate of abandonment and underutilization of assistive technology,

it is imperative that AT professionals find ways to determine reasons for abandonment

rather than assume student disengagement. Based on John's comments, it appears that barriers such as slow computers or programs that regularly crash prevent some students from appreciating the promised benefits of AT. John's description of his frustrating experience as an AT user is supported by several authors (Mann, Hurren, & Tomita, 1993) who have investigated reasons for the high rate of underutilization of AT, and have found that some ATs do not sufficiently provide the type or extent of assistance required. Other authors (Phillips & Zhao, 1993) similarly suggest that poor device performance is a contributing factor to AT abandonment among users. In John's case it appears that he was optimistic at the prospect of getting some help with his schoolwork but became disillusioned with the poor performance of his laptop, causing him to abandon his SEA equipment.

Susan (an AT trainer) expressed that despite being trained on specific AT programs many students reverted to using popular software programs such as Microsoft Word because everyone else uses it. Susan expressed it this way:

> Yes, just the same thing everybody else uses: "It doesn't make me different, right? So if I'm just using Word, that's what the kid over there uses too… he doesn't have to use the talking word processor."

Jane (the EA) similarly points out the tension experienced by students who have a need for assistance but feel singled out by special programs. Jane gives this example: "Kids will say, 'Oh Miss, am I using this because I can't read?' I say, 'No, it's just helping you be a better reader.'" Jane also adds that she wishes students would have a sense of pride in using AT programs instead of being concerned about other students' awareness of them using different programs. Jane illustrates her point this way:

> If the student is not proud [about the AT] I find it's harder, but once the kids feel good about it, and feel that, "you know what, it's just an extra tool, it's not because I'm dumb," it's that extra tool if they can use it and be proud of it: it makes a world of a difference. If they are not proud, it's hard… kids don't like to use it and let other kids see, but… I would love to see most kids get to that point, that, you know what? Use it and be proud.

Jane and Susan's observations have implications for the tensions between the special nature of AT programs and the objective of empowering students through this form of accommodation. Minnow (1990) addresses this tension in her ground-breaking "dilemma of difference" theory. Minnow asserts that the requirements of students with special needs transcend language and physical or mental disabilities. She further contends that labelling and inconsistent treatment of individuals with disabilities is a direct result of decisions by the legal system. This in turn creates confusions and problems in the way that individuals are relegated to categories that determine whether they are included or excluded from political, social, and economic activities.

Sandra (a parent participant) points out a similar challenge in getting her youngest child to accept AT. Sandra believes that,

> What will happen in the classroom? It will be comments like, "Oh, Shelly's got a computer, why does Shelly have a computer in the classroom?" and then Shelly starts to feel more and more embarrassed, and more and more ashamed and… maybe from the other kids' perspective it's kind of a cool thing. She kind of internalizes and interprets it as being something that sets her apart in a negative way. I think the core issue is that it is technology that's coming into the classroom that's not the norm… if there were 3 or 4 other laptops in the classroom and Shelly had one of those that was more for her use, but that there were others that were

around for the kids to use and kind of tap into, it
wouldn't be an issue. I think the fact is it's unique.

It is interesting to note that after facilitating a "successful" introductory group

training session with Shelly, another student, and their parents, when I returned to

conduct Shelly's one-on-one follow-up session, Shelly communicated through her

parent that she was having difficulty adjusting to the use of her SEA equipment in the

classroom and was not keen on being trained that day (Reflective Journal, 2010). At the

time of the interview, Sandra (Shelly's parent) reported that "she really is now sadly

leaving it [the SEA laptop] in the resource room." It is also interesting to note that when

students discontinue use of their equipment, it is oftentimes relegated to the resource

room where it is out of sight.

I had a similar encounter at Shelly's school involving two other female SEA

students. On the day of a scheduled introductory training session I was greeted by a

teary-eyed Britney, who handed me a note from her mom. Britney's mom wrote that,

> Britney has had some issues about using the computer
> and I know Chelsea [Britney's friend, scheduled for
> training later that day] is also having issues. Chelsea
> was over at our house on the weekend and both girls
> were pretty upset. Maybe if you could take them aside
> and speak to them to find out what their concerns are,
> that would be great (Reflective journal entry, 2010).

When I spoke with each student they mentioned that their laptops were placed at the

back of the classroom and they felt excluded from the rest of the class. They both

insisted that having to use their laptops prevented them from keeping up with the rest of

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the class. Both students appeared upset and were not very receptive to learning the prescribed AT programs.

In addition to feeling stigmatized by SEA equipment and training, some students contend that they no longer require the technology for the reason that it was originally prescribed: in other words, they had "overcome" their disability. Phillips and Zhao (1993) contend that change in user needs or priorities is a significant contributor to AT abandonment or discontinuance. Sandra points out that in her son's case, he no longer felt that he needed AT:

> I think what happens, and I've seen that with many
> children with disabilities, the need for specific
> technology changes over time so, for example, his need
> really was for text to speech… by the time he hit high
> school his reading proficiency was fine… You know, he
> can read, he can extract information, his
> comprehension is good, so the Kurzweil system was
> not necessary… and he has gotten so fast at typing…
> his spelling has improved, he's learned more of the
> formal structures of essay writing and things like that,
> so to be honest, he's kind of outgrown the need for
> specific programs… I think that's important to keep in
> mind as the children's need for the technology and
> supports change over time.

Several authors (Kintsch & DePaula, 2002; Scherer, 1996) suggest that the environment within which AT users interact with the technology impacts the effectiveness and usefulness of the tool. If students using SEA equipment are preoccupied about the consequences of being discovered by their typically achieving peers, they are unlikely to use assigned AT with consistency. The authors further suggest that the entire context within which AT is being used must be taken into account.

According to Anna (an AT trainer in the study), several factors need to be taken

into account in understanding the context within which SEA students are being trained.

She highlights the following factors:

> How is it [the AT programs] being used? Is the student
> being left on their own to kind of figure this out after
> they get the 3 hours with me? Is it being incorporated in
> their learning? Do the teachers have the resources to
> be able to use to its full potential?

Anna continued her description of the various contexts and environments within which

she has conducted SEA training and explained that in some more inclusive schools,

> When I do the training there's teachers around, kids
> coming in and out of the room, and the kids who don't
> have laptops are excited for the kids who have laptops.
> So it's not a stigma it's, "Oh this is cool, how could I use
> it and how can I get one?"… Like I said, it depends on
> how the school integrates the technology. Are the
> students put in a separate room and they are just kinda
> one of "those kids," or are the kids in the classroom with
> the rest of their peers using the technology and the
> other kids want to figure out how they can become part
> of that?

Anna also described other types of environment that are less than ideal. For example,

Anna expressed that,

> The way that we perform the role is usually there will be
> myself and then one student, two students. Like I said,
> if I'm lucky there'll be educators there and parents
> there, but most of the time it'll be me and a student and
> what I am just really hoping that they'll get out of it is
> knowing that they have these tools, knowing how to use
> it just as a very basic function… It's so rare that an adult
> is in the room with me when I have a student.

In addition, Anna feels that there is a huge disparity between school boards and, in particular, the level of teacher and parent involvement in SEA training sessions. She describes the situation this way:

> I've been to school boards where it was very common for a parent and a teacher to be there, and then I go to another school board and the kids don't have the laptops, they don't know I'm coming: there's no parent, there's no teacher, there's no EA [educational assistant]. There's only me and the student, and we kind of do the best that we can, and the student doesn't know why I'm there: they're kind of nervous of me. "Am I being tested?" They ask, are they in trouble?

Anna points out another aspect that shapes effective SEA training for teachers:

> I've had instances where the teacher is not aware that I'm coming and she's sitting in the class, like, she's sitting there like going through the motions of getting the training back at me. She's mad, she's upset, she's got stuff to do, and no one told her. There wasn't that level of respect and then, I don't blame her, but she takes it out on me or she takes it out on the students, and I think it's very tough for these people, who are subject matter experts every day of their professional lives. to be put into a situation where they don't even know how to turn the computer on but they can't tell me, 'cause what if I tell their administrator? Or they don't know why the student has this or how much work are they going to have to do to implement this, what's expected of them, and they think I know the answers but I'm the wrong person to go to.

Anna continues her description of what she considers challenging environments for SEA students to be trained in by suggesting that the following factors should be considered:

Number one: is the student even aware of how to use the computer, period, and then to give them software that's specialized. Number two: support. Are teachers there? Are parents there? Are they [teachers] aware of what the students are doing? Does the teacher have access to the software? The student might have Kurzweil, but the teacher might not.

Anna and Susan (the two AT trainers in the study) suggested that students did not appear to make a distinction between not wanting the laptop and not wanting the training. As noted earlier, Susan stated that,

The ones who would be the most resistant are the ones who are just resistant to getting the laptop. It's not a personal thing… they don't want the laptop therefore they don't want the training.

Susan added that although some kids think it is cool to have a laptop, younger students appear to be more eager about the equipment. Susan describes the older students' response this way:

[In] middle school they have a real almost diversion, a resistance to it if it makes them or they feel it makes them or… I have seen some of them just don't think they need it and it will make [them] look different.

Students' resistance to receiving a SEA laptop is inextricably linked to their response to SEA training, since it is mandatory for students with SEA laptops to receive training. SEA training sessions appear to add another layer of complication for students who are already resistant to receiving a laptop. These students oftentimes feel stigmatized by the presence of a trainer, insist that they don't need their SEA laptop or training, or argue that training is a waste of time. Sandra (a parent participant) describes her son's

feelings about being taken out of class for participation in a SEA training session as "he felt that that's a waste… that he was missing class time."

Students were asked to describe the involvement of parents, teachers, and trainers in their technology use. Stephanie expressed that without the help of her parents and SERT (special education resource teacher), she would not have had access to the SEA technology. Stephanie explained that,

> Without my parents and without Ms. Smith, I couldn't
> have got, like, got the laptop or been able to get access
> to this technology. They've both played like a big role in,
> I guess, getting me the technology.

Stephanie has repeatedly expressed appreciation for the difference that AT has made in her education. Her positive response and engagement with AT reflects the important contribution that parents and teachers make in creating supportive environments for AT users. Stephanie's reference to her teacher's role in getting her AT is consistent with researchers' (Kalyanpur & Kirmani, 2005) views that teachers can ensure appropriate accommodation for students with disabilities through the use of AT. Other researchers similarly support a collaborative team-based approach to assistive technology implementation, with the family as an integral part of AT decision-making. Christopher responded in a similar manner by pointing out that his parents and teachers are definitely supportive of his use of AT. He added that although his parents are not actively involved with AT, they are supportive of its use. Christopher expressed it this way:

> I would say that my parents are definitely supportive.
> Their participation isn't much more than that, like, they

are not active in my involvement with technology, but at
the same time they are very supportive of whatever
path I'm wanting to take with it.

Patrick also expressed that his resource teacher and parents were supportive of

his use of AT. He highlighted his parents' role in encouraging him to use the technology.

Patrick stated that,

My parents just, they help me, like, they didn't really
know a lot of words. They just supported me I guess.
They tell me to keep using it, keep using it for a while,
tell me to keep using it.

It is worth noting that at the secondary level it is not uncommon for parents to

play a limited role in the implementation of AT for their children. In fact, while it is

common for parents to participate in training sessions for students at the primary level,

parents are noticeably absent from sessions for secondary students. The notable

decrease in parental participation for secondary students does not necessarily reflect

lack of interest or support for AT, but could be a result of other factors such as parental

discomfort with technology, SEA students' need to reduce unwanted attention, and

parents' attempts to encourage greater independence and stronger self-advocacy skills.

Research studies have long established that teachers play a pivotal role in the

implementation of technology use in the classroom (Brosnan, 1998; Conlon & Simpson,

2003; Cuban, Kirkpatrick, & Peck, 2001; Mercer & Fischer, 1992; Schoefield, 1997). As

highlighted by students Christopher, Stephanie, and Patrick, at least one teacher was

instrumental in proactively responding to their need for AT accommodation. Specific

instances of teacher involvement in the acquisition of AT was expressed by these three students. Christopher explained that,

> It was the end of grade 10, I believe, and that's when I finally got the laptop and although the process was slow… Miss Bryan, my earlier communication teacher… really got the process moving along once I got into high school. She kept constant tabs on it and she knew how it was coming and how to work with it, and I believe that having a teacher like that is mainly the reason why I have a laptop at school today, and if it isn't for that connection then it won't happen.

Stephanie similarly recognized the crucial role her teacher played in her acquisition of AT. As noted above, she explains,

> Without my parents and without Ms. Smith, I couldn't have got, like, got the laptop or been able to get access to this technology. They've both played like a big role in, I guess, getting me the technology.

Patrick reiterated the role teachers played in his use of AT, adding that,

> Miss Campbell, she use[d] to work here… she taught me very good… Miss Phillips help[ed] me out with them [the programs] a lot.

Donna describes her role and involvement with the SEA process as largely administrative in nature. In her role as Head of the Special Education department, Donna's responsibilities related to SEA involve arranging for students SEA laptops to be delivered, preparing tickets requesting the repair of damaged laptops, scheduling SEA training sessions, and providing alternative equipment such as an AlphaSmart while a student's laptop is being repaired. Donna describes herself as "a catalyst. I am the person that contacts everyone and makes it happen."

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Despite the overwhelming body of research affirming the pivotal role played by educators in effective implementation of AT, Donna (the special educator in the study) admitted to not having received training in AT, and identified two barriers to teachers' effective implementation: (a) inadequate technical support and (b) lack of training in the use and application of AT in the classroom. Donna specifically highlighted areas of specific need:

> Maybe more training for us… like, when we have PD days, instead of having just yet another PD day on collaborative problem solving that the board may be focused on, for the people who are in special education, maybe they could have a hands-on for every SERT in all the board. At least once a semester have a hands-on experience with the newest AT. Using Premier with somebody telling them what to do, not like here [where] it is "Download it at home and play with it right because if you don't know the program then you don't know where all those cool tricks are."

Donna also adds that,

> When you have to pay a ton of money to go to a workshop and you end up having to pay for it yourself and take off time… it's hard for teachers to do that… And so I think if it were brought to them in a PD day, where it's meant that, where you're supposed to learn those things specifically for those people, then I think it would be good. I think that's the one thing that's missing… and since the laptops have been introduced we've never had anything like that.

Although some researchers (Ashton, Lee, & Vega, 2005) suggest that individuals who are appropriately trained are more apt to consider and utilize AT, other researchers such as Lahm (2003) suggest that lack of knowledge is not an acceptable reason for not pursuing AT. Despite not being trained in the use of AT, Donna has been instrumental

in acquiring SEA computers for students, and has also created a supportive environment that encourages the use of AT.

Consistent with the views of several researchers (Raskind & Scott, 1993; Young, 2013), most students agreed that getting formal training on how to use prescribed AT programs proved very helpful. Stephanie expressed that although she might have been able to figure out the various programs, it was especially helpful to have a trainer "explain all the different parts and components." Christopher similarly expressed that he would not have been able to do all the things he can do without the help of a trainer. Raskind and Scott (1993) point out that to be motivated to learn to use technology, the student must accept that a disability exists. Moreover, the student must have an immediate need that can be met with technology. Christopher and Stephanie are both aware of their learning disability diagnosis. Both students were also able to clearly articulate their understandings of what it means to have a LD. Their positive response to AT intervention can be largely attributed to their recognition that their educational needs can be and are being met by AT. Both students have identified tangible results and benefits of using AT. For example, as noted above, Christopher explained that,

> You have programs like Inspiration, which will help you storyboard or create a mind map of everything you have to do. It can help you with organization, with creation of ideas, and then you have something like Kurzweil, which will help you read back your notes to you, and then you have WordQ SpeakQ, which will help you write down your project from the notes, and all of this in a process together helps you not only get the work done but change the way you view yourself, your capabilities, and what you can get done.

Stephanie also values AT for the tangible results she has been able to recognize. She explained that,

> I do find Kurzweil especially helpful and I think it's called Smart Ideas… it makes it a lot easier for me to get my ideas down and a lot of time I have great ideas and I forget them and I can write them down in the notes and the different parts of the program that allow me to write down every, like, thought before I forget it.

Summary

A summary of participants' responses relating to the contexts within which SEA students were trained revealed that students' experiences were layered and varied dramatically, depending on contextual factors including the visibility of equipment, the segregated nature of training, the self-determination of students, and the perceived benefits and reliability of AT equipment.

Some of Christopher's comments provided key insights into students' experiences in navigating the special nature of SEA laptops and training. First, he commented that students were curious about the school board's name on his SEA laptop and, second, that it was initially an awkward experience to receive a SEA laptop (in grade 7) when no one else had one. Despite acknowledgement of the isolated nature of AT training and use, Christopher took advantage of the tangible benefits of using the technology. It should be noted that Stephanie received her SEA equipment in grade 12 and as such, her acceptance and positive response to AT could be attributed to her level of maturity and self-determination, since she was able to quickly identify the advantages or promised empowerment of AT use.

A review of John's (the student who found his laptop to be too slow) responses toward AT provided plausible explanations for some students' disengagement with AT. John's responses suggest that his SEA laptop did not provide an advantage in the classroom because it was very slow and caused him to fall behind his peers. John's experience highlights the need for AT service providers and educators to explore the compatibility of the device and AT software, the impact of compatibility issues on hardware and software performance, and students' frustrations and subsequent disengagement from and abandonment of AT. Christopher's suggestion that it would be ideal to provide everyone with AT training also has implications for implementation of AT in schools.

AT trainer Susan and EA Jane perceived that a barrier to students' acceptance of AT is related to the special nature of AT software. Sandra (parent) similarly suggested that the dynamic of technology moving in and out of the classroom with the identified student reinforced the perception of differentness and contributed to an internalized stigma of intellectual inferiority, which in turn compromised the promised empowerment of AT. These insights provide considerations for AT in schools, given that under the current practice AT equipment is assigned to specific students based on recommendations of assessments instead of being widely available for use by all students.

Other observations relating to the contexts within which AT training and use take place include the inclusiveness of the learning environment, the teacher's involvement, and the teacher's willingness and ability to integrate technology into students learning. These factors have implications for the supported nature of the environment for

sustained AT use and students' level of acceptance. AT trainers Anna and Susan noted that there is a direct correlation between students' acceptance of AT and the inclusivity of the environment. This insight has implications for ensuring that educators are trained in AT, in order for them to support long-term use of these tools in the classroom. This approach would provide educators an opportunity to simultaneously normalize use of AT while integrating its use into strategies that enhance the overall learning experience for all students. For example, educators could use the Inspiration software during brainstorming exercises to create a visual mind map for the entire class.

Chapter 7: How Teachers, Parents, and Trainers See Their Role in the Technology

Assistance Program

> My role would be, I guess, first to advocate for it and
> then, once it's in place, to become better informed
> about it myself, and then to try to encourage its use and
> kind of facilitate its use wherever I can, especially at
> home. (Parent participant Maureen, 2010)

With a growing focus on making curriculum content accessible to all students, assistive technology has been gaining increasing support in educational institutions across North America. This has coincided with major advances in computer technology and the ubiquitous spread of personal computers in school settings. The proliferation of technology use in Ontario schools is especially evident among students with disabilities given that a large number of these students are provided with laptop computers, software programs, and training under SEA funding. These students also receive support from parents, teachers, and technology trainers, all of whom play significant roles in students' adoption of AT. For example, many students who access assistive technology services do so with the assistance of parents who may have recognized their child's need for support and advocated for AT. Similarly, teachers provide ongoing support and encouragement for students' use of AT in undertaking educational tasks. Technology trainers guide students through the process of becoming competent users of assigned assistive technology programs.

As key stakeholders in the implementation of AT, the perspectives of parents, teachers, and AT trainers can provide useful insight into their level of involvement with AT, their impact on students' responses to AT, and how their roles might have evolved

over time. Their perspectives can partially illuminate the ways in which extrinsic factors influence students' responses to AT.

Balancing Parental Involvement and Self-Advocacy

Parents in the study were asked how they became involved in the SEA process for their children. Sandra explained that she works with children with disabilities in her professional practice, and was therefore aware of the process of getting accommodations in place. She explained that after having the assessments completed for all three of her children, she explored how they would benefit from assistive technology and it was included as part of their prescription. Despite her early involvement in advocating for her children's acquisition of assistive technology through the SEA program, Sandra admits that she is currently

> Completely removed from the technology for my two older ones, more involved with my younger one who is still in elementary school. My two older ones are grade 11 and 12, high school, and ever since they got to high school I felt completely detached from the whole process, whereas there's much more involvement that's facilitated at the elementary school level.

Abernathy and Taylor (2009) provide plausible explanations for Sandra's position by suggesting that while students with disabilities are in elementary and middle schools, academic decisions are typically made by parents, this becomes less true in secondary school. Seligman (1975) argues that this is necessary: as students progress through secondary school, greater emphasis should be placed on developing self-advocacy skills to prevent a state of learned helplessness. Sandra adds that although she is aware of the need for students to self-advocate as they get older, she is concerned that

students are oftentimes ill-equipped to effectively advocate for needed services. Sandra

makes the point that a gap exists between students' ability to self-advocate and parents'

ability to advocate for their continued use of technology in the high school setting. She

elaborates further:

> I think when they are at high school, part of the struggle
> is, for a parent who has a child with a learning disability,
> is that there is much more emphasis on the child self-
> advocating… not that that's a bad thing, but a lot of
> children are not equipped to do that, and so there
> becomes an increasing gap in their ability to access the
> services they need and supports they need and,
> especially, I think a gap in terms of what parents can do
> to advocate for their child's continued use of
> technology. For example, like my oldest, I think, they
> arrived at high school and the computers followed them
> shortly thereafter and they've stayed in the cupboards
> collecting dust.

Sandra's description of her changing role and its impact on her children's decision to

discontinue use of their SEA equipment is further supported by Abernathy and Taylor's

(2009) position that as students become older, parental roles change. The authors also

put forward the simplified notion that as students move into higher education they must

assume the role of primary decision-maker in their academic life, and therefore should

possess the ability to self-advocate. Sandra highlights tensions between the expectation

that students should self-advocate and the unintended consequence of students not

accessing needed resources or, worse, make decisions to discontinue use of vital

services such as SEA equipment. Sandra further clarifies this point by explaining that:

> With my youngest I'm able to contact the SERT and her
> homeroom teacher, because there's one teacher
> specifically for most of her subjects, and say, "How is it
> going? Is she bringing it [the SEA laptop] to class? …

What's the barrier? Can we work around that? Can we
get some of her friends involved?" I can strategize a
little bit more, so I feel I have much more involvement in
that.

With reference to her limited ability to influence her high school children's use of SEA

equipment, Sandra adds, "you lose a lot of control."

While acknowledging the value of parental support and involvement in students'

academic life, Phillips (1990) suggests that it might be more beneficial for parents to

assume the role of "mediator of learning," referring to any supportive other such as

siblings, parents, teachers, or grandparents who intentionally influences the interaction

between the learner and the environment. This approach is thought to allow students an

opportunity to develop skills to enhance their independent learning.

In response to the question of how involved she has been in the SEA process for

her son, the other parent participant in this study, Maureen, describes her involvement

as limited. She clarified that although she was involved with the IEP process and aware

of the recommendation for AT, she was never involved in the SEA portion of the

process. Maureen clarified that "it was decided what he would need and the software to

go along with it… then I got a copy of what the recommendations are." When asked

specifically how her son became identified and whether she advocated for him,

Maureen stated that she advocated for her son to be assessed and worked with the

various professionals to have the right assessments done. She expands further,

I advocated. I got it started in getting the right people to
do the right assessment. The occupational therapist
was involved in the early stages so, yes, I advocated
and worked with people who were then able to identify

that that would be the best thing for him if he had a
computer.

It has been well documented (Parette & Brotherson, 1996; Parette, VanBiervliet, & Hourcade 1996) that AT in a home represents a major change for families and, in particular, a shift in roles of students and family members. These authors identify several factors that determine family's response to AT. These factors include family receptiveness to AT and family willingness to implement AT. Although Maureen was not actively involved with the SEA process she is supportive of her son's use of AT. It is also interesting to note that although Maureen's son is in a secondary school, her involvement in the implementation of AT takes the form of reminding her son to take the technology to school and following up with his resource teacher to ensure that he or she is aware of his AT accommodation. Maureen further clarifies this point by explaining,

> I have to remind Kevin… not now but at the beginning
> when he came back to school this year, I made sure
> that he took everything to school. Like the computer,
> the scanner, his headset, just to be sure that it was
> there because I noticed one day he actually left it at
> home and I text[ed] him and said, "Oh, why don't you
> have this?" and he said, "I don't use it today." So I said,
> "You need it every day."

To ensure that Kevin is supported at school, in addition to contacting the resource teacher Maureen assumes the responsibility of informing Kevin's individual subject teachers of his AT accommodation. Maureen stresses the importance of making Kevin's teachers aware of his accommodation:

> I stay in touch with the resource teacher as well to
> ensure that… well, first of all, to make sure that they are
> aware because I know that a lot of times the teachers

are busy, don't have an opportunity to read everything that is in his OSR [Ontario School Record], so I go into the school or stay in touch by email with the resource teacher and with his classroom teachers, to ensure that they know he's got the technology, they know he's got the equipment, why he's got it, and how best he can benefit from it.

Hourcade, Parette, and Huer (1997) posit that the family's perceived need for AT is an important variable impacting how effectively the support is received. Maureen's involvement on several levels is instrumental in Kevin's positive response to AT and in preventing AT abandonment.

Although Maureen is the primary decision-maker in Kevin's academic life, she makes it clear that she is careful to include Kevin in all decisions affecting his academic life and, in particular, the details of his AT accommodation. Maureen adds that she wanted to ensure that Kevin understood what was happening because being informed about these decisions would be empowering to him. Maureen elaborates further:

He [Kevin] is very, very aware and that was one of the challenges of… well, in the beginning I wanted to make sure that he understood what was happening with him because in understanding something, having all the information about something… adds power. It empowers you to be able to deal with it. From all along in this whole process I got him involved in trying to understand what was going on.

Maureen's statement vividly illustrates her awareness and a calculated attempt on her part to foster what Campbell-Whatley (2008) refers to as self-determination. The author posits that self-determination is a combination of skills that facilitate self-regulated and goal-directed behaviours. The author further suggests that when students with disabilities are taught self-determination lessons they are better able to determine

their strengths and weaknesses, feel more empowered, and exhibit elevated self-esteem and self-concept. The author further points out the following dimensions in self-determination: (a) awareness (knowing), (b) self -concept (perception), (c) advocacy (support), (d) realization (understanding), (e) self-esteem (respect), (f) acceptance (approval), (g) empowerment (authority), (h) reflection (image), (i) control (management), and (j) regulation (adjustment). Maureen describes her son's awareness of decisions related to his academic life and also suggests that he demonstrated a positive response to AT. Based on the factors highlighted by Campbell-Whatley, it is conceivable that an awareness and understanding of issues affecting his academic life has prepared Kevin for AT intervention, causing him to be more receptive to the accommodation.

Both Sandra and Maureen, the parents in the study, were asked to describe how they see their role in the SEA implementation process. Sandra thinks that her role as a parent is to advocate for accommodation and become more informed about the technology. She adds that her role is to try to encourage and facilitate its use. As noted above, Maureen similarly expresses that,

> My role would be, I guess, first to advocate for it and
> then, once it's in place, to become better informed
> about it myself, and then to try to encourage its use and
> kind of facilitate its use wherever I can, especially at
> home.

Sandra also acknowledges tensions between encouraging the use of SEA technology and allowing her children to willingly engage with the technology. She clarifies this point in stating:

I never really kind of came down hard and insisted and said, "You must use that computer and it's gonna be in the classroom." I was never hardline about it because I knew the more I insisted the less they would embrace it. I wanted them to find their own way of using it in a way that suited them.

Although Sandra admits that her children have not embraced assistive technology, her approach reflects an attempt to foster self-determination in decisions related to their academic life. Similar to Sandra's response regarding her role in the SEA implementation is Maureen's belief that her role is to continue to advocate for Kevin. She illustrates this point with the example of having to make contact with several individuals to ensure that Kevin was able to get his text in a format that was compatible with his text-to-speech program for summer school. She points out, "those are just things that someone has to be there all the time advocating for." She adds, "as a parent, I always have to push to get things going."

Maureen and Sandra's responses reflect the value they place on being advocates for their children. Although Sandra's children are not enthusiastic about SEA equipment, she highlights the importance of advocating where possible and encouraging its use. Maureen similarly describes her role as an ongoing advocate to ensure that Kevin benefits from his SEA accommodation.

Educator Involvement

The two educators in the study, Donna and Jane, were asked to describe how they became involved with the SEA program. Jane, an educational assistant, describes her role as ranging from preparing students' IEPs to encouraging students to use specific programs for specific tasks. Jane commented that:

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> As an educational assistant, I assist in the classroom
> and when I say I assist in the classroom, not just
> basically sit there and do simple things with the kids, I
> get involved. I do the IEP, sit down with teachers, and
> decide who really need[s] the claims, and my role is,
> when the program comes in, the kids get the computer,
> my role is to make sure I am fully trained on it and
> understand it, and I can look for various programs that I
> know some kids will really make the best out of it… in
> the Special Ed Room, we make sure the kids try out
> each program to see which best suit their purpose.

Jane adds that prior to students receiving and using SEA equipment in the Special Education/Communications Room, she had limited experience with technology in her practice.

Research on paraprofessionals is oftentimes inconsistent and at times contradictory. For example, a number of authors question the role and value of paraprofessionals in special education (Blalock, 1991; Fletcher-Campbell, 1992; French & Pickett, 1997). However, other authors (Blalock, 1991; Downing, Ryndak, & Clark, 2000; Riggs & Mueller, 2001) acknowledge that "paraprofessionals have become important members of a team who assist in educating students with a range of disabilities in general education classrooms." Several authors similarly describe the utilization of paraprofessionals as key to the successful inclusion of students with special needs (Blalock, 1991; Parsons & Reid, 1999; Salzberg & Morgan, 1995; Wadsworth & Knight, 1996; Werts, Zigmond, & Leeper, 2001).

Although much contemporary literature portrays paraprofessionals as providing one-on-one support for students with disabilities, Jane works in the Special Education/Communications Room in a secondary school where students with

disabilities access supports and resources. It is interesting to note that although research overwhelmingly discusses issues related to paraprofessional support in inclusive and non-inclusive classrooms, the role and extent to which paraprofessionals are involved in the implementation of AT has not been documented.

In explaining her role in the SEA implementation process, Jane highlights the importance of being trained in AT in order to support students' use of the technology. For Jane, having an understanding of the technology allows her to identify situations in which students can be encouraged to take advantage of the technology. Jane illustrates this point by explaining that,

> I try to go to each program when the kids are being
> trained in the classroom. I'll be there by their side,
> looking on and learning myself, because if I don't learn,
> it's hard for me to encourage the kids.

Jane's response is supported by researchers (Bryant, Erin, Lock, Allan, & Resta, 1998), who recognize that the pervasiveness of computers in the classroom, coupled with an increase in educational software, requires general and special educators to acquire, demonstrate, and develop competencies with various devices. Unlike Jane's hands-on involvement with the SEA program, Donna (a special education teacher) describes her involvement in the SEA program as administrative in nature. Her responsibilities include handling communication from feeder schools or school boards, dealing with SEA students, and arranging SEA training. Donna elaborates further:

> I'm more of an admin person and more or less keeping
> track of things. As the head of Special Education, all the
> claims and laptops and everything and all the students
> with the laptops come to me, so I would know which kid

has a laptop and I usually get some kind of
communication, either from the feeder school or from
the board, saying this student still needs training… so
and so from ABC Company [pseudonym] will be
contacting you regarding training, so that how: that's my
connection to that.

Similar to Jane's response, Donna admits that prior to her involvement with SEA,

technology played a limited, if not nonexistent, role in her teaching practice. She

explains further:

When I first started teaching there were no computers…
but then, as we started to have computers in the school,
most of my students… I worked with life skills students
as opposed to the kids who were in regular classes,
and so there wasn't as much use for those kids having
them and so my experience might have been having a
student who might have had a touch talker or
something like that, but not so much laptops and
computers and then, by the time that they actually start
to do all these laptops… I was more in an administrative
role than in the classroom.

Although Donna is not directly involved with supporting SEA students in the use of

technology, she recognizes and acknowledges the important role that technology plays

in the academic efforts of students. Donna explains that:

Every time I talk to somebody there's something else,
you can use this or you can use that… which is
wonderful for our kids who really can't read very well, so
just to be able to have Adobe Acrobat Reader, those
kinds of things… something simple like that for kids who
can't take notes to be able to scan something and then
be able to highlight it and, because they are not good at
writing notes, to be able to listen to a book and be able
to look at it and highlight and take out the points and
they can actually write a paper. A lot of kids couldn't do
that before, so the technology certainly helps with that.

Accordingly, Donna responds to students' need for training or laptop repairs with a

sense of urgency. For example:

> If something goes wrong with their laptops, then once it
> comes to me I write the ticket, I get the tech in as soon
> as possible so that the least amount of time is wasted,
> 'cause we don't have extra laptops to give them while
> theirs is being repaired. In the meantime, I offer them
> an AlphaSmart to take the place of that while their
> laptops are gone.

Donna further illustrates her approach to ensuring that students receive training in a

timely manner in a supported environment this way:

> I have a boy now who's just getting a laptop and so I
> had to make the contact with the person to do some
> training with him and have made arrangements for his
> major teacher, his SERT, [and] his mom to come, and
> so they'll now all spend an afternoon together to get
> trained on the programs.

In response to the question of how her role has changed since the introduction of

SEA, Jane explains that she feels a sense of satisfaction seeing the difference

technology has made in student learning. For Jane, technology allows students with

disabilities the ability to experience "the everyday basic things" that students without

disabilities are able to perform. Jane further elaborates on this point by adding:

> It's a little bit more satisfaction for me working with kids
> with the technology, because you see kids in the
> regular stream class… they [are] doing the everyday
> basic things but see, kids who have a special disability
> and can honestly, may be not able to read things, to
> open a text book and read it [as] fluently as they would
> like to, and to have a technology that could read
> something to you, and you could understand it, what it
> is saying, it makes a world of a difference. So I find just

being in the Special Ed Room and using the technology
with kids who I see can start out so very limited [in their]
reading, and to see how much they excel because of
the program makes a world of a difference.

Battle and Blowers (1982) provide a fitting description of Jane's observation by

describing AT as something that supplies the missing skill while allowing students to

gain access to a whole new level of learning. Forgrave (2002) similarly suggests that AT

provides a compensatory alternative: having the means to build on their strengths and

compensate for their weaknesses can result in students' increased motivation, higher

rates of learning, and improved achievement.

When asked how she sees her role in the SEA program, Jane describes her role

as facilitating and motivating students' use of technology to overcome particular

challenges. While reflecting on her role Jane commented that:

I think my role is to look at individual kids and see
where they feel that, "because I am in this class I am
using the technology, that means I'm dumb." I find ways
to show the kids it's not a matter of dumb, it's
something to enhance… what you have. Like for
instance… kids will say, "Oh Miss, am I using this
because I can't read?" I say, "No, it's just helping you
be a better reader." Or some kids may love to write,
some kids… don't like to write, so there it is. It's easy
for them to type out or it's easy for them to put it on
WordQ and they speak, 'cause some kids, when it
comes to writing it's so… difficult compared to when
they can verbally say what they want to say. It comes
across easier for some kids.

Jane's reference to students' concerns that they are using the technology

because they are "dumb" or "because [they] can't read" suggests that in addition to

supporting students' intellectual needs, she is engaged in attending to their social and

emotional needs. Heyman (1990) suggests that because children with learning disabilities must contend with academic failures, their self-image is particularly at risk. With this in mind, Jane provides an environment where students are encouraged to explore alternatives that mitigate the effects of a LD.

In response to the question of how she sees her role in the SEA implementation process, Donna describes herself as the individual that makes things happen while encouraging teachers knowledgeable in AT to train their peers. Donna expressed that:

> I think I am a catalyst. I am the person that contacts everyone and makes it happen and then, like, ask the teachers to kind of share the wealth, so train the trainer kind of thing… So someone like Marie [pseudonym], who is really good with AT, I would have her work with other SERTs so that way, if they are teaching a GLE or if they have kids in their resources room that need assistance with their tech, they'll be able to help them.

AT Trainer Role

Trainers Anna and Susan were asked how they see their role as AT trainers. Anna expressed her belief that the role she plays as an AT trainer is actually different than her perception of what the role should be. Anna explains her position within the context of the participants involved in the AT training session:

> The way that we perform the role is usually… there will be myself and then one student, two students. Like I said, if I'm lucky there'll be educators there and parents there, but most of the time it'll be me and a student.

Anna also believes that her role is to help students become aware of the tools they have and helping them to become familiar with the basic functions of these tools. She elaborates further:

> What I am just really hoping that they'll get out of it is
> knowing that they have these tools, knowing how to use
> it, just as a very basic function, and just knowing how
> they can use it.

Ensuring that students understand that having a laptop "shouldn't be something to be ashamed of or something to be nervous about" is especially critical to Anna because:

> If they can get to a level of proficiency with their
> software and even their computer, they'll have a heads-
> up on all the other kids around them or people when
> they go to work as adults.

In response to how she views her role besides training, Anna explains that she considers herself an advocate in ensuring that in the absence of supports within their school, students get something out of their training session:

> We're thinking an advocate, definitely. Kind of like, what
> can I show them so that when I'm not here and they
> don't have that support at school or at home, how can
> they use the software, how can they get something out
> of it?

Anna believes it is important to show students that "adults who are great learners use computers" and as such she explains that:

> When I teach Dragon I say, "Do you know who uses it?
> Police officers, doctors, and lawyers and all these smart
> people. They're smart enough to use technology to their
> advantage," and I really try to push that… especially
> with the older kids: don't worry about why you have the
> computer, worry about how you can take advantage of
> this for yourself.

In response to the question of what changes she would suggest to the way that AT training is currently delivered, Anna believes that the key to effectively support SEA

students in their use of AT is to create a team environment that reflects a partnership between AT trainers and educators. Anna describes the process:

> Right now it's almost like you're working in isolation…
> it's you and the student and again, if you're lucky an
> adult will be there, and there's no follow-up… I think it's
> nice to give the training to a student, but I think there
> needs to be a component where we actually need to
> train the teachers who are going to be helping the
> students with the software and the ones who are going
> to have to implement this into the curriculum for these
> particular students.

Anna feels that establishing a long-term relationship is a "huge piece that's missing."

Susan, the other AT trainer in this study, feels that her role is to teach students how to apply different AT programs to complete actual schoolwork. Susan further describes her role as being more than showing students programs and technology:

> It is more… now you have Kurzweil, now what are we
> going to do with it? How is this going to help you with
> your schooling?

Susan's belief that her role as an AT trainer is to create opportunities for students to make the connection between AT and actual schoolwork leads her to have students work on actual assignments in their training sessions. Susan feels that when students use AT for actual schoolwork they are able to experience tangible outcomes in the way that AT helps them accomplish a task they might not have been able to without the technology. Susan elaborates on this point by adding to her students, "Let's do some actual schoolwork and see, does this help you?"

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Furthermore, Susan believes that this approach individualizes the training for students and provides choices in the way that they are able to approach assignments. In Susan's view, providing AT training allows students the opportunity to

> Use the technology to get the information in. For some reason they are not getting it the standard way… it's a way for getting that information in and then, conversely, it is also a way for them to get the information out. So if something is blocking that from the head to the paper the technology could help with that as well.

Susan's ideas are consistent with those of several authors (Blackhurst, 1997; Cavalier, Ferretti, & Okolo, 1994), who describe assistive technology as a form of cognitive prosthesis that replaces impaired abilities or provides individuals support to undertake and complete a task with greater independence and efficiency than they would have been able to without AT.

In addition to assuming an approach that involves actual schoolwork, Susan believes that effective coaching requires an understanding of what students find challenging and employing appropriate strategies to address their particular needs. For Susan, this means asking students:

> How do you feel about reading? How do you feel about writing? Do you struggle? … Are you a good speller? … I don't know anything about you: I am here to help you use your computer and I want to make sure that we do what helps you the most.

In response to the question of what changes she would suggest to AT training, like Anna Susan believes that being able to provide frequent follow-up sessions to students would be beneficial to them. She explains further:

I would like to go more often, I would like to do more
follow-ups… when I get a chance I would like to go
back [to] see them. So I think they need some ongoing
support.

Both AT trainers' responses reflect some tensions between their practice and
perceived roles. Anna and Susan's views about the role of AT training center around the
idea that AT implementation should be viewed as a partnership between parents,
students, educators, and trainers. Such a partnership is central to fostering a supported
learning that is geared to accommodate the different learning needs of students using
AT.

Summary

Parents', educators', and AT trainers' responses reveal the critical and unique
roles they play in students' use of AT. Maureen and Sandra (parents) highlight the
significance of early intervention and involvement in accessing support for their children
with LD. Both parents admit that although they were strong advocates in ensuring that
their children were formally identified and received AT, they became less involved as
their children progressed through school. Their responses also revealed tensions in
balancing parental involvement in students' academic experience with fostering the
development of self-advocacy skills. Sandra admitted that discontinued use of AT was
one notable unintended consequence of not being as involved with her older children's
academic decisions.

Educators (Jane and Donna) perceive themselves as being responsible for
promoting and encouraging use of AT. Jane (an EA) described the importance of being

knowledgeable about AT in order to encourage its use in specific situations, while Donna (a SERT) saw her role as more pragmatic, arranging acquisition of SEA equipment, scheduling training for students, and arranging repair of devices. Both educators acknowledged the critical role of AT in students' academic success and were aware of the need to encourage and support students who were not keen to use their SEA equipment because of internalized stigma. Jane referred to the affective consequences of AT and her need to often address and re-frame negative self-talk to promote productive use of AT. Although Donna admitted to not being knowledgeable about AT programs, she was supportive of her staff being trained in AT in order to support students in their classrooms. From their responses, both educators saw themselves as facilitators and motivators for AT use.

AT trainers' (Anna and Susan) description of their roles revealed a multi-faceted approach to fostering student engagement with AT. On one hand, they were responsible for creating an awareness of AT programs as educational tools while developing students' aptitudes in the use of the programs. On the other hand, students were often resistant to using SEA laptops and attending training sessions. As such, AT trainers were often forced to address the social and emotional concerns of these students in order to get them to a state of readiness for training. Students' sustained use of AT as part of their academic experience was an area of emphasis for AT trainers.

Anna noted that in the absence of AT support within the school environment and home, AT trainers perform the role of advocates by showing students how to get the most out of AT and encouraging its use. Susan similarly described their role as creating opportunities for students to realize tangible benefits of AT by making connections

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between actual schoolwork and AT. This took the form of using AT to complete

assignments during training sessions. Both trainers believed that strong partnerships

between educators and AT trainers would foster a more inclusive environment and

sustained support for students accessing AT.

Chapter 8: Summary, Limitations, and Recommendations

This chapter summarizes the study, provides critical reflections of participants' perceptions of their experiences with AT implementation, and makes recommendations for future studies or practice involving integration of AT in educational settings based on data analyzed in previous chapters. Limitations of the study are identified and addressed.

The study was undertaken to investigate whether the promise of technology is compromised by the visibility of technology support and how students who access technology through the Special Equipment Amount (SEA) negotiate any related social dynamic. The themes that emerged from an analysis of qualitative interviews presented participants' experiences and perceptions of what it means to navigate social labelling in academic contexts with an LD diagnosis, of AT use and training, and of issues impacting engagement with AT.

The background of this study was informed by literature reviews of AT efficacy and implementation, self-concept issues relating to LD diagnosis, and students' and parents' understanding of LD. The impact of having an invisible disability made visible by technology support was also discussed.

The study was conducted using a qualitative research approach including in-depth phenomenologically based interviews and a grounded theory methodology for analyzing collected data. The research participant pool comprised students with

learning disabilities who are users of assistive technology, parents, educators, and AT coaches.

The following themes emerged from data analyzed through a constant comparison method. First, there appeared to be a strong connection between the variables of awareness, understanding, and acceptance.

1. A direct relationship exists between students' unawareness or knowledge of having a disability and lack of knowledge regarding why they have a SEA laptop.

2. There appeared to be a strong connection between students' awareness and understanding of the diagnosis of LD and their willingness to "own" or accept a disabled identity in order to access necessary supports such as AT.

3. Overall, awareness, understanding, and acceptance of a LD appeared to significantly impact students' willingness to happily engage with AT.

Second, beliefs expressed by participants about responses to AT revealed tensions (double-edged sword, dilemma of difference) between the promised empowerment of AT and the negative self-perception related to AT use. Using AT in settings where teachers were neither knowledgeable nor involved with AT contributed to feelings of isolation for some SEA students.

Third, students appeared to be unwittingly caught in a cost-versus-benefit dynamic, such as independence and improved abilities versus inferior status and social

labelling. Consistent with the literature on stigma related to invisible disabilities, students in some instances appeared to shoulder the burden associated with the social cost of being perceived as academically inferior as a consequence of using AT in contexts that were not inclusive.

Fourth, participants perceived several reasons for lack of engagement and abandonment of SEA equipment, including stigmatized identities, compromised self-esteem, and indifference. Although these reasons prove to be barriers to successful integration and engagement with SEA equipment, the findings in this study revealed that stigma is a major contributor to disengagement and abandonment of AT in secondary schools.

Limitations of the Study

This study encountered several limitations that should be taken into account. First, 11 participants were interviewed for this study because of scheduling conflicts and the willingness of students to discuss their experiences with AT. Although this can be considered a small sample size, the principle of purposive sampling facilitated selection of key stakeholders who were able to offer significant insights into the phenomena being studied. Future studies could include other types of invisible disabilities including ADHD and mental health conditions and would provide a broader range of participants. Second, I was unable to conduct direct observations because of concerns relating to observer effect and classes available to be observed. Third, interviews took place close to exams and the end of the school year, resulting in lower student participation. Fourth, there was a huge disparity between students who were able to willingly participate and

sufficiently articulate their experiences and students who participated but did not provide significant usable information. Despite the stated limitations, the diversity and range of participants interviewed (students, parents, AT trainers, and educators) provided significant breadth in perspectives and insights into the experiences of SEA students accessing AT. These insights provide possible recommendations for future research relating to students' attitude toward AT in post-secondary contexts and for policy makers' and school administrators' consideration of strategically facilitating AT implementation in more inclusive and supportive environments.

Recommendations for Practice and Further Research

The study was able to prove that tensions existed between the promised empowerment of AT and actual experiences of SEA students in various contexts, and will contribute to existing research based on reported consequences of AT implementation in less-than-ideal contexts. Lessons learned from this study suggest that AT training contexts and professional development for teachers is critical to SEA students feeling supported in classrooms in which teachers are knowledgeable about AT.

Further research is recommended to explore students' attitudes toward AT in transitioning from secondary to post-secondary contexts and their impact on AT abandonment. Based on this study and prevailing literature, internalized stigma is a pervasive dimension in the experience of students with LD in secondary settings. There is evidence that this is also the case for some students in post-secondary environments (Lightner, Kipps-Vaughan, Schulte, & Trice, 2012). It would be useful to explore

students' responses to academic accommodations such as AT to better manage the challenging demands of post-secondary education. Other elements to consider include receptivity and sustained use of AT, and consideration of what AT abandonment looks like in post-secondary contexts.

Another worthwhile area to investigate is the experiences of SEA students with multiple disabilities and/or other types of invisible disabilities including mental health conditions and ADHD. Although this study primarily focused on students with LD, many students are diagnosed with other types of invisible disabilities that impact academic performance. Some literature addresses tensions experienced by individuals with invisible disabilities who may either decide to "pass" as non-disabled, to avoid stigmatization, or proactively disclose their disability in order to access assistance (Goodrich & Ramsay, 2013). It would be useful to determine if the presence of a mental health condition, ADHD, and/or multiple disabilities increases the functional impact of disabilities, causing students to be more motivated to access resources such as AT.

Finally, it is important to investigate strategic planning for AT implementation in schools and associated outcomes. Based on this study and related literature, students receiving AT support would benefit from careful planning and implementation that takes into account adequate training for educators (Dell, Newton, & Petroff, 2012; Conlon & Simpson, 2003; Cuban, Kirkpatrick, & Peck, 2001; Lee & Vega, 2005; Burne, Knafelc, Melonis, and Heyn, 2011) and a broad-based proactive approach in creating a learning environment for all types of learners, regardless of disability type. It would be useful to explore the impact of this type of environment on stigma, student engagement with AT, and subsequent academic outcomes.

While the findings of this study will contribute to practice and research in critical disability studies and education, it is important to note that the acceleration of developments in AT warrant more up-to-date observations around the implementation of and practice involving AT.

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Appendix A: Certificate of Ethics Approval

YORK
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UNIVERSITÉ
UNIVERSITY

Certificate #:	**STU 2010 - 068**
Approval Period:	**05/20/10-05/20/11**

**OFFICE OF
RESEARCH
ETHICS (ORE)
5th Floor, York
Research Tower**

4700 Keele St.
Toronto ON
Canada M3J 1P3
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Memo

To: Janice Fennell, Faculty of Education, janfen@yorku.ca

From: Alison M. Collins-Mrakas, Sr. Manager and Policy Advisor, Research Ethics
         (on behalf of Daphne Winland, Chair, Human Participants Review Committee)

Date: **Thursday 20th May, 2010**

Re: Ethics Approval

        Technology and Disability Identity: "Now you see me, now you don't"

I am writing to inform you that the Human Participants Review Sub-Committee has reviewed and approved the above project.

Should you have any questions, please feel free to contact me at: 416-736-5914 or via email at: acollins@yorku.ca.

        Yours sincerely,

                Alison M. Collins-Mrakas M.Sc., LLM
                Sr. Manager and Policy Advisor,
                Office of Research Ethics

Appendix B: Student Assent Form

Date: June 2010

Research Project Title: Technology and Disability Identity: "Now You See Me,

Now You Don't"

Researcher: Janice Fennell

Research Supervisor: Professor Ron Owston

Sponsor: York University

Dear Student,

Purpose of the Research: I am a doctoral student in the Faculty of Education at

York University and an Assistive Technology Consultant for students with learning

disabilities. I will be conducting research to explore what students think about

themselves when they use technology in school. The information will help me to

understand the responses and attitudes of students receiving computer assistance. The

information will be used for my doctoral dissertation and will be shared only with

members of my committee and will not be used for any other purposes without your

express consent.

What You Will Be Asked to Do in the Research: You will be asked to participate in two (2) 30-minute audio-taped interviews which will then be transcribed. The interviews will be held at a venue to be determined based on your convenience and in consideration of privacy issues over a 3-week period.

Risks and Discomforts: I do not foresee any risks or discomfort from your participation in the research.

Voluntary Participation: Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence the nature of your relationship with the researcher, York University, or any other group associated with this project.

Withdrawal from the Study: You can stop participating in the study at any time, for any reason, if you so decide. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researcher, York University, or any group associated with this project.

Confidentiality: All information you supply during the research will be held in confidence and unless you specifically indicate your consent, your name will not appear in any report or publication of the research. You will be assigned a pseudonym. Your name will be kept strictly confidential and will not be used in the presentation of results or associated with the results in any way or available to anyone except the principal investigator. Your data will be safely stored on a password-protected computer in my home office and only I will have access to the computer. All collected data will be kept for three years and then securely deleted from my computer. Digital audio recordings

will be transcribed immediately after the interviews into my computer and then permanently deleted from the digital audio recorder. Confidentiality will be provided to the fullest extent possible by law. The data will be used for my doctoral dissertation and the results of this study will be disseminated through published articles or conference presentations.

Questions about the Research: If you have questions about the research in general or about your role in the study, please feel free to contact me, Janice Fennell, Ph.D. Candidate, Graduate Program in Education, by e-mail janfen@yorku.ca, or my supervisor Dr. Ron Owston, University Professor, Faculty of Education, York University, by telephone 416-736-5019 or by e-mail rowston@edu.yorku.ca. This research has been reviewed and approved by the Human Participants Review Subcommittee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Office of Graduate Program in Education, 282 Winters College, York University (telephone 416-736-5018 or e-mail gradprogram@edu.yorku.ca) or Alison Collins-Mrakas, the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Research Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures

I was present when _____ read this form

(or had it read to her/him) and gave verbal assent.

_____

Person who obtained assent

_____   _____

Signature   Date

Appendix C: Parent Informed Consent Form

Date: June 2010

Research Project Title: Technology and Disability Identity: "Now You See Me,

Now You Don't"

Researcher: Janice Fennell

Research Supervisor: Professor Ron Owston

Sponsor: York University

Dear Participant,

Purpose of the Research: I am a doctoral student in the Faculty of Education at

York University and an Assistive Technology Consultant for students with learning

disabilities. I will be conducting research to explore what students think about

themselves when they use technology in school. The information will help me to

understand the responses and attitudes of students receiving computer assistance. The

information will be used for my doctoral dissertation and will be shared only with

members of my committee and will not be used for any other purposes without your

express consent.

What You Will Be Asked to Do in the Research: You will be asked to participate in one (1) 30-minute audio-taped interview which will then be transcribed. The interview will be held at a venue to be determined based on your convenience and in consideration of privacy issues.

Risks and Discomforts: I do not foresee any risks or discomfort from your participation in the research.

Voluntary Participation: Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence the nature of your relationship with the researcher, York University, or any other group associated with this project.

Withdrawal from the Study: You can stop participating in the study at any time, for any reason, if you so decide. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researcher, York University, or any group associated with this project.

Confidentiality: All information you supply during the research will be held in confidence and unless you specifically indicate your consent, your name will not appear in any report or publication of the research. You will be assigned a pseudonym. Your name will be kept strictly confidential and will not be used in the presentation of results or associated with the results in any way or available to anyone except the principal investigator. Your data will be safely stored on a password-protected computer in my home office and only I will have access to the computer. All collected data will be kept for three years and then securely deleted from my computer. Digital audio recordings

will be transcribed immediately after the interviews into my computer and then permanently deleted from the digital audio recorder. Confidentiality will be provided to the fullest extent possible by law. The data will be used for my doctoral dissertation and the results of this study will be disseminated through published articles or conference presentations.

Questions about the Research: If you have questions about the research in general or about your role in the study, please feel free to contact me, Janice Fennell, Ph.D. Candidate, Graduate Program in Education, by e-mail janfen@yorku.ca or my supervisor Dr. Ron Owston, University Professor, Faculty of Education, York University, by telephone 416-736-5019 or by e-mail rowston@edu.yorku.ca. This research has been reviewed and approved by the Human Participants Review Subcommittee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Office of Graduate Program in Education, 282 Winters College, York University (telephone 416-736-5018 or e-mail gradprogram@edu.yorku.ca) or Alison Collins-Mrakas, the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Research Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures

I, _____, consent to participate in the "Technology and Disability Identity" research conducted by Janice Fennell. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

_____   _____

Signature   Date

Participant

_____   _____

Signature   Date

Principal Investigator

Appendix D: Technology Coach Informed Consent Form

Date: June 2010

Research Project Title: Technology and Disability Identity: "Now You See Me,

Now You Don't"

Researcher: Janice Fennell

Research Supervisor: Professor Ron Owston

Sponsor: York University

Dear Participant,

Purpose of the Research: I am a doctoral student in the Faculty of Education at

York University and an Assistive Technology Consultant for students with learning

disabilities. I will be conducting research to explore how students' identities are

constructed when technology and learning disabilities intersect. The information will

contribute to deepening my understanding of what determines the attitude of students

receiving assistive technology coaching toward the technology. The information will be

used for my doctoral dissertation and will be shared only with members of my

committee and will not be used for any other purposes without your express consent.

What You Will Be Asked to Do in the Research: You will be asked to participate in one (1) 30-minute audio-taped interview which will then be transcribed. The interview will be held at a venue to be determined based on your convenience and in consideration of privacy issues.

Risks and Discomforts: I do not foresee any risks or discomfort from your participation in the research.

Voluntary Participation: Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence the nature of your relationship with the researcher, York University, or any other group associated with this project.

Withdrawal from the Study: You can stop participating in the study at any time, for any reason, if you so decide. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researcher, York University, or any group associated with this project.

Confidentiality: All information you supply during the research will be held in confidence and unless you specifically indicate your consent, your name will not appear in any report or publication of the research. You will be assigned a pseudonym. Your name will be kept strictly confidential and will not be used in the presentation of results or associated with the results in any way or available to anyone except the principal investigator. Your data will be safely stored on a password-protected computer in my home office and only I will have access to the computer. All collected data will be kept for three years and then securely deleted from my computer. Digital audio recordings

will be transcribed immediately after the interviews into my computer and then permanently deleted from the digital audio recorder. Confidentiality will be provided to the fullest extent possible by law. The data will be used for my doctoral dissertation and the results of this study will be disseminated through published articles or conference presentations.

Questions about the Research: If you have questions about the research in general or about your role in the study, please feel free to contact me, Janice Fennell, Ph.D. Candidate, Graduate Program in Education, by e-mail janfen@yorku.ca or my supervisor Dr. Ron Owston, University Professor, Faculty of Education, York University, by telephone 416-736-5019 or by e-mail rowston@edu.yorku.ca. This research has been reviewed and approved by the Human Participants Review Subcommittee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Office of Graduate Program in Education, 282 Winters College, York University (telephone 416-736-5018 or e-mail gradprogram@edu.yorku.ca) or Alison Collins-Mrakas, the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Research Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures

I, _____, consent to participate in the "Technology and Disability Identity" research conducted by Janice Fennell. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

_____   _____

Signature   Date

Participant

_____   _____

Signature   Date

Principal Investigator

Appendix E: Teacher Informed Consent Form

Date: June 2010

Research Project Title: Technology and Disability Identity: "Now You See Me,

Now You Don't"

Researcher: Janice Fennell

Research Supervisor: Professor Ron Owston

Sponsor: York University

Dear Participant,

Purpose of the Research: I am a doctoral student in the Faculty of Education at York University and an Assistive Technology Consultant for students with learning disabilities. I will be conducting research to explore how students' identities are constructed when technology and learning disabilities intersect. The information will contribute to deepening my understanding of what determines the attitude of students receiving assistive technology coaching toward the technology. The information will be used for my doctoral dissertation and will be shared only with members of my committee and will not be used for any other purposes without your express consent.

What You Will Be Asked to Do in the Research: You will be asked to participate in one (1) 30-minute audio-taped interview which will then be transcribed. The interview will be held at a venue to be determined based on your convenience and in consideration of privacy issues. I also will be observing SEA students as they use technology in your classroom.

Risks and Discomforts: I do not foresee any risks or discomfort from your participation in the research.

Voluntary Participation: Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence the nature of your relationship with the researcher, York University, or any other group associated with this project.

Withdrawal from the Study: You can stop participating in the study at any time, for any reason, if you so decide. Your decision to stop participating, or to refuse to answer particular questions, will not affect your relationship with the researcher, York University, or any group associated with this project.

Confidentiality: All information you supply during the research will be held in confidence and unless you specifically indicate your consent, your name will not appear in any report or publication of the research. You will be assigned a pseudonym. Your name will be kept strictly confidential and will not be used in the presentation of results or associated with the results in any way or available to anyone except the principal investigator. Your data will be safely stored on a password-protected computer in my home office and only I will have access to the computer. All collected data will be kept

for three years and then securely deleted from my computer. Digital audio recordings will be transcribed immediately after the interviews into my computer and then permanently deleted from the digital audio recorder. Confidentiality will be provided to the fullest extent possible by law. The data will be used for my doctoral dissertation and the results of this study will be disseminated through published articles or conference presentations.

Questions about the Research: If you have questions about the research in general or about your role in the study, please feel free to contact me, Janice Fennell, Ph.D. Candidate, Graduate Program in Education, by e-mail janfen@yorku.ca or my supervisor Dr. Ron Owston, University Professor, Faculty of Education, York University, by telephone 416-736-5019 or by e-mail rowston@edu.yorku.ca. This research has been reviewed and approved by the Human Participants Review Subcommittee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Office of Graduate Program in Education, 282 Winters College, York University (telephone 416-736-5018 or e-mail gradprogram@edu.yorku.ca) or Alison Collins-Mrakas, the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Research Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures

I, _____, consent to participate in the "Technology and
Disability Identity" research conducted by Janice Fennell. I have understood the nature
of this project and wish to participate. I am not waiving any of my legal rights by signing
this form. My signature below indicates my consent.

_____   _____

Signature   Date

Participant

_____   _____

Signature   Date

Principal Investigator

Appendix F: Parent Interview Questions

Dear Parent,

Thank you for agreeing to participate in my research regarding the intersection of technology and learning disabilities. As mentioned in the Informed Consent Form, we will have one (1) 30-60 minute interview. I have included an interview guide to provide you with an idea of the questions that will be asked during our time together.

Interview Guide for Parents

1. Could you please tell me a bit about your background with computers?

2. Do you have a computer at home and what is it mainly used for?

3. Have you been involved with the SEA claim process for your child?

4. How would you describe your current involvement with the process?

5. What does the diagnosis of a learning disability for your child mean to you?

6. a) Is your child aware that he/she has a learning disability?

   b) Who explained the identification of learning disability to him/her? How was it explained?

7. What is your child's understanding and response to being identified as such?

8. a) How would you describe your child's response to receiving access to technology through SEA? Have you noticed any changes over time?

   b) How would you describe your child's response to technology training?

9. How do you understand the role of technology in your child's academic development?

10. What do you perceive your role to be in this process?

11. Do you believe that your cultural background affects your attitude toward assistive technology? Explain.

Appendix G: Teacher Interview Questions

Dear Educator,

Thank you for agreeing to participate in my research regarding the intersection of technology and learning disabilities. As mentioned in the Informed Consent Form, we will have one (1) 30-60 minute interview. I have included an interview guide to provide you with an idea of the questions that will be asked during our time together.

Interview Guide for Teachers

1. a) How did you become involved with the SEA program?

2. b) What was your experience with technology before taking on the role of special education teacher?

3. c) Did you use technology as part of your teaching practice?

4. a) How has your role changed from being a regular classroom teacher to working with students who access technology through SEA?

5. b) How do you see your role as a special education teacher for students with SEA funded equipment?

6. How would you describe students' response to being diagnosed with a learning disability?

7. How do you understand the role of technology in students' academic development?

8. Have you participated in any assistive technology training sessions involving students and/or parents?

9. How would you describe students' response to assistive technology?

10. How would you describe students' response to technology training?

11. Have you seen changes in student learning and achievement with the introduction of assistive technology?

12. What has been your greatest challenge in coordinating assistive technology for your students?

13. Do you believe that your cultural background affects your attitude toward assistive technology? Explain.

14. How would you like to see assistive technology implemented in the future?

Appendix H: Interview Questions for AT Coach

Dear Assistive Technology Coach,

Thank you for agreeing to participate in my research regarding the intersection of technology and learning disabilities. As mentioned in the Informed Consent Form, we will have one (1) 30-60 minute interview. I have included an interview guide to provide you with an idea of the questions that will be asked during our time together.

Interview Guide for Assistive Technology Coaches

1. Could you please tell me a bit about your background in assistive technology?

2. How do you understand the role of technology in students' academic development?

3. How do you see your role as a coach?

4. What are students understanding of being given SEA equipment?

5. What do students think is the purpose of computers in their education?

6. How would you describe students' response to technology training?

7. How do students generally communicate an awareness of being identified as having a learning disability?

8. Are there any particular challenges that you have noticed with students receiving assistance?

9. How would you describe the level of involvement of parents, teachers and students in technology training?

10. Do you believe that your cultural background affects your attitude toward assistive technology? Explain.

11. Based on what you have shared during our meeting, and your experience, would you suggest any changes in the role of assistive technology coach and the coaching program?

Appendix I: Student Interview Questions

Dear Student,

Thank you for agreeing to participate in my research regarding the intersection of technology and learning disabilities. As mentioned in the Informed Consent Form, we will have two (2) separate 30-minute interviews. I have included an interview guide to provide you with an idea of the questions that will be asked during our time together.

Interview Guide for Students

Interview One

1. a) How long have you been attending this school?

    b) How many classes do you take?

2. Do you have a laptop or desktop computer at home?

3. How did you learn to use the computer?

4. How much time do you spend using technology at home and what do you use it for?

5. What are some activities you engage in outside of school with friends and/or at home?

6. Before getting your own computer at school how did you feel about computers?

7. What's it like to have your own computer equipment at school?

8. How do you feel about getting computer training at school?

9. Are there other students in your class with their own computer equipment?

10. Do other students ask you about your equipment and training? Describe how you feel about their questions.

Interview Two

1. a) What does it mean to you to be identified as having a learning disability?

   b) How was this explained to you?

2. Why do you think you have a computer at school?

3. Based on your experience with computers, do you find your computer programs helpful?

4. What do you think is the purpose of computers in your education?

5. How would you respond to the idea that it is "cool" to have your own laptop at school?

6. How would you describe the involvement of your parents, teachers, and

    trainers in your technology use at school?

7. What has been teachers' response to your needs as having a learning

    disability?

8. How do you see yourself using these computer programs after high

    school?

9. Do you believe that your cultural background affects your attitude toward

    assistive technology? Explain.