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Transition Issues in Higher Education and Digital Technologies: The Experiences of Students with Disabilities in New Zealand

Research on transition to higher education and young people with disabilities has increased in recent years. However, there is still limited understanding of transition issues and how digital technologies, such as social media and mobile devices, are used by this group of students to manage these issues. This article presents the findings of an empirical study that addressed this matter based on young people's views and experiences. The qualitative study was conducted in the context of a group of students with vision impairments transitioning to a New Zealand university. The findings draw from observations, a researcher diary, focus groups, individual interviews, and data from social media. The study shows that, like their non-disabled peers, the students actively engaged with interactive and collaborative digital technologies to make sense, individually and collectively, of different transition issues before, during and after the first academic trimester of their university journey.

Keywords: transition; vision impairment, disability; social media; mobile devices; young people.

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Introduction

The role technology can play for young people with disabilities in the context of higher education has been a topic of interest in academia for some time. A significant body of research has concentrated on assistive technologies (e.g. magnifying software, assistive listening devices) and how they can best compensate for students' impairments and support study in the tertiary setting (Asselin 2014). Similarly, the accessibility of technological tools, such as websites, has not only been a research topic but also a demand of the disability community (Paciello 2015). In the same vein, the development of instructional approaches such as eLearning and distance education are argued to provide students with disabilities with opportunities for participation and enhanced learning (Kent 2015).

However, despite the pervasiveness of social media and mobile devices among young people (Anderson and Jiang 2018; Pacheco and Melhuish 2018), what is not yet clear is the way students with disabilities interact with these emerging technologies (Pacheco, Lips, and Yoong 2018; Seale 2013). Most studies have focused on non-disabled students and the impact of digital tools on their academic and social adjustment (Ellison, Steinfield, and Lampe 2007; Gikas and Grant 2013). The limited research on disability and digital tools, other than assistive technologies, has centred on adults and their use of these tools for communication and disability activism (Ellis and Goggin 2014).

It is in this context that we conducted a qualitative study guided by two underpinning research questions:

RQ1: What transition issues are experienced by students with vision impairment in higher education?

RQ2: How do these students use digital technologies, specifically social media and mobile devices, to manage transition issues?

We believe that answering these questions is essential to support these students to successfully navigate a critical period of change, such as transition to university, and to enhance their participation and inclusion in higher education.

Disability in Higher Education

Over the last decade a growing number of students with disabilities has been enrolling in tertiary institutions around the world. For example, in England, enrolments of these undergraduate students increased from 160,740 to 204,665 between the academic years 2013/14 and 2017/18 (Higher Education Statistics Authority 2019). Meanwhile, in Australia, there were 51,773 enrolments in 2017, up from 33,706 in 2012 (Koshy 2018). Census data from New Zealand show that in 2013 young students (aged 16 to 39) had the same level of participation in higher education as their non-disabled peers (Earle 2019). Despite the numbers, higher education is a challenging experience as the dropout rate is almost double among this group of students compared to their non-disabled peers, they are less likely to graduate, and if they manage to stay they spend more time studying (Bardin and Lewis 2008; Caton and Kagan 2007; Cobb et al.

2006; Earle 2019). As a result, students with disabilities are subjected to an extended or fractured transition affecting their development as young adults (Caton and Kagan 2007).

For this study, we focused on students with vision impairments because they face particular and practical challenges due to their limited sight affecting their transition experience. For example, writing communication (e.g. using a pen and a piece of paper to write down lecture notes) can be arduous and time-consuming for low-vision students, and impractical for those who are totally blind (Presley and D'Andrea 2009). Managing the heavy reading requirements which include textual and graphical material also makes their study and learning experience difficult (Butler et al. 2017). While measuring visual acuity is useful, exploring how students use their functional vision, the way a person uses her remaining vision to meet the specific demands of real situations (Corn and Koenig 1996), is key to understanding how they make sense of transition challenges.

Transition issues in higher education

The theory of student departure (Tinto 1993) stresses that academic and social issues are critical for students' transition and integration into higher education. Dealing with the academic issue requires students to adjust to new educational responsibilities, activities, and culture (Tinto 1993) that demand from them a set of academic skills, study habits, and motivation (Murray, Wren, and Keys 2008). In tertiary education, students with disabilities not only face a new environment in which they have to become independent learners, they also realise that the personalised support they received in high school to manage study and learning is no longer available (Janiga and Costenbader 2002). Most students with disabilities are unprepared to manage academic duties because they have not received adequate guidance in high school (Hong et al. 2007). Thus, failing to cope with the academic issue can be a factor in dropping out of higher education (Tinto 1993).

Research on specific social media platforms (e.g. Facebook, Twitter, wikis and blogs) in tertiary settings among non-disabled students suggests these tools can be used to manage the academic issue. These studies (Irwin et al. 2012; Ophus and Abbitt 2009) highlight that students perceive them as tools that facilitate communication with classmates and participation in course discussions as well as posting of and access to notes and course material. The use of technology can also help students to become self-directed learners (Robertson 2011). In this respect, digital tools act as personal learning environments that give the student control over their own learning through the creation, organisation, and sharing of content (Martindale and Dowdy 2010). Similarly, Gikas and Grant (2013) add that students' use of mobile devices beyond the physical boundaries of classrooms to search and access information in an unstructured and contextualised manner supports formal learning. Furthermore, just as important as having access to information and resources, digital tools enable collaborative learning (Gikas and Grant 2013). While technology use can cause student distraction in the classroom (Traxler 2013) its implications for managing academic challenges are more apparent.

Students with disabilities also must deal with the social connections issue – which involves a student's social interactions with peers, faculty and support staff within the tertiary setting, for instance, university halls, cafeterias and student clubs (Tinto 1993). For students with disabilities, being able to build these connections is important for social support (Papasotiriou and Windle 2012), and their quality can have

an impact on academic success (Lombardi, Murray, and Kowitt 2016). Students with impairments, who struggle to build social connections, report a sense of social isolation (Sacks, Wolfe, & Tierney, 1998), perceptions of social rejection (Kekelis and Sacks 1992), and both low self-esteem and self-confidence (Stockley and Brooks 1995). In this context, research and practice have centred on helping students with impairments to develop social and interpersonal skills, so they can build strong and positive peer relationships and start successfully exploring adult roles on and off campus (Bakken and Obiakor 2008).

Students are not only quick adopters but also have a preference for technology that enables interactive and synchronous communication (Quan-Haase 2008). This preference and the integration of a range of different technologies into their daily life activities (Anderson and Jiang 2018; Pacheco and Melhuish 2018) can have implications for managing the social connection issue. Evidence shows that technology-mediated communication can help to delay students' usual decline of social ties with high-school peers after moving away from home (Cummings, Lee, and Kraut 2006). The use of social media has also been reported to facilitate the preservation of existing social ties, which are an important source of students' emotional support, as well as the formation of new connections (Ellison, Steinfield, and Lampe 2007; Yu et al. 2010). While technology can help to manage the need for or lack of connections during transition, its use complements but does not replace face-to-face interactions, which remain essential for students' socialisation in the tertiary setting (Madge et al. 2009). Despite the usefulness of these studies, their focus is on non-disabled students. Whether students with disabilities use digital tools to build and maintain social connections during transition remains unclear.

Disability and Digital Technologies

Two opposing paradigms have influenced thinking on disability. On the one hand, the medical model describes disability as a pathology or dysfunction that requires medical intervention to alleviate it (Ellcessor and Kirkpatrick 2017). On the other, the social model claims disability is socially constructed. It differentiates impairment from disability, arguing that "while bodies may have impairments, those impairments become disabilities only in the context of specific physical and social environments" (Ellcessor and Kirkpatrick 2017, 5).

These two perspectives have also influenced the way disability is seen in the context of technology. The medical model's perspective on technology, for example, is one of techno-determinism. It argues that people with disabilities will be unambiguously assisted as technology compensates or attenuates the "problems the disabled person has or... augments the person, who because of a disability has not attained the normal and accepted range of abilities" (Roulstone 1998, 11). In contrast, the social model asserts that technology cannot be seen uncritically as disability is also constructed in and through technological tools, which generate a digital disability (Goggin and Newell 2003). However, while some acknowledge that digital technologies can help to compensate for people's impairments, advocates of the social model stress that these tools still reproduce existing social and cultural boundaries of exclusion (Moser 2006).

Empirical research, meanwhile, provides differing evidence regarding the opportunities and challenges of digital technologies for disability. Some studies show that people with disabilities find technology to be a vehicle for self-representation (Darcy, Maxwell, and Green 2016), knowledge sharing and collaboration (Pacheco,

Yoong, and Lips 2017), enhancing their community engagement (Gale and Bolzan 2016) as well as providing a sense of control and empowerment (Chib and Jiang 2014), and helping them to develop self-determination skills (Pacheco, Lips, and Yoong 2019). Despite the apparent benefits, people with disabilities still face issues such as web accessibility, high set-up costs, and inadequate technical support (Ellcessor 2010). A related issue is digital inclusion as people with impairments are less likely to be online than non-disabled people (Dobransky and Hargittai 2016). Despite the opportunities provided by touch screen-based devices such as tablets (Cumming, Strnadová, and Singh 2014), these tools, according to Macdonald and Clayton (2013), still reproduce structural inequalities that disempower people with impairments. This contrasting evidence suggests, thus, that technology can have a double-edged sword effect on disability (Chib and Jiang 2014).

This study did not take for granted a therapeutic role of technology, nor did it seek to denounce the structural forces that reproduce inequality. Guided by the tenets of constructivism (Lincoln and Guba 1985), it sought to understand students with vision impairments' individual and collective construction of meaning regarding transition issues and how digital technologies were used in that context.

Method

As the purpose of qualitative inquiry is to study people and the social and cultural contexts within which they live (Myers 1997), it suited our objective of understanding students with vision impairments' experiences of transition issues and their use of digital technologies. Among different research methods such as ethnography or case study, we chose action research as it not only aims to expand scientific knowledge but also to solve practical problems (Baskerville and Myers 2004). As transition is a more challenging experience for students with disabilities, we used action research not only to expand current knowledge but also to support participants in their transition. Action research requires the researcher(s) to intervene to address a practical issue. Thus, we implemented online and face-to-face interventions along two cycles (see the Data Collection sub-section for details). Another reason for using action research was its established suitability for the study of the interaction between people and technology (Baskerville and Wood-Harper 1996).

Research Participants

Participants were all new students at Name University in New Zealand. They were purposefully selected because we looked for in-depth understanding of the research topic through information-rich cases (Patton 2002). Since the University's disability community includes students experiencing a range of impairments, we decided to work with students with vision impairments. We did so following Patton's advice for working with homogeneous samples, which centres on describing "some particular sub-group in depth" (Patton 2002, 235). In doing so we were able to explore in detail their experiences of transition issues and use of digital technologies.

A total of 19 students (10 females and 9 males) participated in the study at different levels. All of them were undergraduate students, aged 18-24 years old. Most came from public schools where they had received personalised teaching support, and only a couple arrived from educational settings such as special education and boarding schools. We managed to recruit participants experiencing different eye conditions ranging from retinitis pigmentosa, Stargardt disease, and diabetic retinopathy, to

macular degeneration. Except for one participant, these conditions were congenital. All participants had some level of functional vision (Corn and Koenig 1996); however, we were unable to recruit totally blind students as none were enrolled at the time of conducting this study.

Participants were contacted with the support of the University's Disability Services unit. One of the authors worked for the unit as a volunteer and part-time researcher during the study to enhance the participant–researcher relationship, gain contextual information about the research topic, and develop data collection procedures.

Data Collection

We collected data through observations, a researcher diary, social media, focus groups and semi-structured interviews. Action research involves a cyclical process and usually requires iteration to achieve knowledge generation and problem solving outcomes (Avison et al. 1999). We collected data during two action research cycles. Cycle one began in February 2012, a few weeks before the start of trimester 1, when the participants were still prospective students, and finished at the beginning of trimester 2. Ten students participated in cycle one. Cycle two was carried out the following year with nine participants, starting in January 2013 and concluding in early trimester 2. Throughout the study we interviewed staff from the Disability Services unit to expand our understanding of working with young people with disabilities from the perspective of practitioners.

Data collection in cycle one

In cycle one, data gathering started with observations. Once participants were contacted, we asked them to allow one of the researchers to attend and observe their individual meetings with a disability adviser. These data were useful to identify early transition issues and concerns from participants' own voices and forge a relationship of trust with them. We complemented the observation data with a researcher diary, which was used to keep records, facilitate retrospective analysis, recall past thoughts and events, and evaluate the outcomes of the research (Borg 2001).

We also collected data through Goingtouni, a website created for this study. Goingtouni was set up via Moodle, an online course management platform. We chose the platform because of its collaborative tools, privacy safeguards, and its user-friendly and accessibility features. The website included transition-related information, links to YouTube videos, and an online forum. As the administrators of the website we were able to see the types of information the participants retrieved before starting university and during the first weeks of the academic trimester. Goingtouni was also part of our online intervention aimed at supporting the participants to deal with transition issues.

In cycle one, we also conducted semi-structured interviews at the beginning of trimester two, 2012. The topics we addressed in the interviews included participants' university experiences, what transition issues they faced, how they dealt with these issues, the role of digital technologies in this regard, their views of the Goingtouni website and other interventions by the study.

Overall, data collection in cycle one provided us with significant insights to identify a number of transition issues; however, our intervention had limited impact on enhancing collaboration and support among the participants. They explained that there was little online interaction because they had not the chance to previously meet face-to-

face. For this reason, we decided to conduct a second cycle, and to adjust our data collection plan by including additional techniques for data gathering.

Data collection in cycle two

As in cycle one, data collection consisted of observations of participants' meetings with their disability advisers, the researcher diary, and the Goingtouni website, which was used as a repository of transition-related resources, especially at the beginning of the academic trimester.

In cycle two we included focus groups. The reason for adding them was to allow the participants to meet each other and enhance interaction and trust among them. In doing so we sought to encourage the collective construction of meaning (Lincoln and Guba 1985) regarding transition issues and their use of digital technologies. Three focus groups were conducted at different stages of trimester one, 2013. Due to their academic commitments, an average of six students attended each focus group session. The focus groups were also part of our interventions. We used the sessions as group support meetings which allowed the participants to make new social connections, share their transition experiences, and provide support and advice to each other. Conducting the focus groups also allowed us to understand how the participants' perceptions and experiences of transition issues evolved through their first trimester at the University.

Another source of data was a Facebook group page we set up following a suggestion from the participants. The students commented that they were active Facebook users, and that despite their vision impairment, the smartphone application of this social media platform was easy to use, and that Facebook was popular among their peers. The Facebook group page was a useful source of data which we collected in the form of online comments, 'likes' and the 'seen by' feature on the platform. The participants quickly adopted the group page as the main communication means during the study, and more importantly, they used the online tool to complement face-to-face conversations that began in the focus groups and build new friendships among them.

Finally, data collection in cycle two concluded with individual interviews conducted in trimester 2, 2013. The interview guide used in cycle one was amended to include questions regarding the usefulness and impact of our interventions, particularly the focus groups and the Facebook group page. Due to the rich and varied data we managed to collect, we concluded that a new cycle was unnecessary, so we decided to continue with the subsequent stages of the study.

Data Analysis

Data analysis was undertaken simultaneously with data collection. It was an ongoing and iterative process that allowed us to refine the interpretations of findings and develop new action research interventions that helped the participants to manage transition issues. Our approach to data analysis was inductive, which means we made "sense of data" (Lincoln and Guba 1985, 202). Our inductive analysis involved unitising and categorising research data (Lincoln and Guba 1985). We started with the former, unitising, by coding raw data into units or single pieces of information that were interpretable in the absence of any additional information (Lincoln and Guba 1985). With the latter, categorising, we arranged the previously unitised data according to categories that provided us with "descriptive or inferential information about the context or setting from which the units were derived" (p. 203). In doing so, we managed to

identify a range of transition issues and understand how the participants used digital technologies.

We undertook different strategies to ensure the quality and rigour of the study. One of those strategies was triangulation. As described above, we collected rich information from different sources such as observations, a researcher diary, focus groups, interviews, and data from social media at different stages of participants' transition experience. We also looked for discrepant evidence and negative cases (Patton 2002) during the data analysis stage which helped us to revise our initial interpretation of findings. Member checking was another strategy used. We provided participants with transcripts of their interviews and shared the main findings with them, asking for their feedback. Peer debriefing was conducted with the two co-authors during data analysis and writing up of the study.

Findings

Engagement with Digital Technologies

One of the themes that emerged from our analysis of the varied data sources was the way participants engaged with a range of digital technologies to manage transition issues. Along with assistive technologies, such as magnifying software or closed-circuit television, the participants employed social media (e.g. Facebook, YouTube), including online tools provided by the University (e.g. Blackboard). They also used mobile devices with wireless internet connections (e.g. tablets, laptops, and smartphones) and, in a few cases, digital voice recorders and cameras. During the focus groups and individual interviews, all participants indicated that digital technologies bring more opportunities than difficulties to their transition experience. As one participant, John, commented:

Technology is one of the biggest helps out there for anyone with a disability. It makes it easier for you to access things. It makes it a lot easier for you to communicate with people, who you need to communicate with, disability adviser, course coordinator or something like that. (John)

Although one student, Bryan, was still experiencing “ups and downs” about university life, he agreed with his peers about the benefits of technology. He used a smartphone, a laptop, and social media – particularly YouTube to support “big study” from lectures.

Participants regarded themselves, to different degrees, as competent users of technology, with two of them calling themselves “technology savvy”. They were open to learning and adapting digital tools for their transition. One participant, Krysten, commented that in high school she used to receive course material printed on large size paper. At university, in contrast, she was emailed the entire workbook so she had to learn how to “work on it on my laptop”. Eventually, she did. This student highlighted the “convenience factor” of accessing course material electronically and concluded that she “will never go back” to the paper-based format. Interestingly, and despite having different eye conditions, participants did not report any accessibility issues when using their laptops, tablets or smartphones. One student mentioned that if a website does not work for her, she just ignores it.

Staff from the Disability Services unit also said that students with disabilities were technologically competent. One staff member, Laura, pointed out that when she

introduces new technology to them such as a magnifying program, the students “pick it up really easily” because “they’ve already got those skills in place”. Another staff member, Jessica, agreed with her colleague and noted that students are keen to share their knowledge about technology with their peers:

Even just five years ago we were providing students with technology, with individual technology and supporting them by providing specific equipment. Now students are coming in and telling us the latest app and they are sharing that information with other students. I think we just got the wave of change that is led by them. (Jessica)

This context suggests a gap between new and older generations of students with impairments as observed by the Disability Services staff:

I have an older student in her fifties doing a PhD and we are providing her quite a lot support that an eighteen-year-old would not need... She is learning ICT but her ability to mould it and use it for the fine detailed work that she needs for her thesis is not easy, not possible really, to pick up and do the thesis at the same time. That is why she is getting somebody doing reading and writing for her. (Emily)

Research has documented how non-disabled students use technology in higher education (Gikas and Grant 2013; Han and Yi 2019). Our findings add to this body of knowledge as they suggest that students with impairments are actively incorporating technology to manage university life. Furthermore, the findings reveal a generation of students with disabilities that differs from previous ones in the way it integrates a range of technological tools not only for university but everyday activities.

Experiences of Transition Issues and Use of Digital Technologies

The second theme was the identification of key transition issues from the perspectives of the participants. We used as a lens Tinto’s (1993) theory of student departure regarding the role of the academic and social connection issues in transition. Interestingly, our findings uncover other transition issues also perceived by the students as important. These insights also describe how the participants used digital technologies to manage transition issues.

Academic issue

For the participants, managing the academic issue was one of the most important concerns. It was a predominant issue before and during the academic trimester. As prospective students, they were not only worried about the University’s entry requirements but also its academic demands. They consulted friends, relatives, and the Disability Services unit about information and/or support to manage this matter. Once at university, participants realised how different university was from high school regarding course workload, academic timetables, and the number of students attending lectures among other aspects. A few described their experiences of dealing with academic responsibilities as “overwhelming”. Such was the experience of Marie, a participant enrolled in English and Classics papers, who commented: “There were a lot of books to read and it just got overwhelming because it was so much stuff to do. Like I had to read maybe fifteen books in the trimester.”

For all participants, managing academic duties was challenging and stressful. In an initial assessment of their transition experience, most perceived that they were not ready for university or did not have the required skills to deal with the academic culture of tertiary education. In line with Tinto's (1993) theory of student departure, those who struggled the most to cope with the academic system considered dropping out of university:

There were a couple of moments I considered it [dropping out]. I think in English, when I got my second assignment and I failed it again, I was like 'I hate this right now'. I was just so upset and I really wanted to cry especially because I put so much effort on that one assignment and still I ended up failing it and I did not understand why [I failed it]. (Anna)

While the literature describes the academic issue as one of the main causes of students' stress, our findings interestingly show that, in a few cases, its mastery can be gratifying, in particular when some students realised, for instance, that they were able to write a research essay on their own.

Digital technologies played a supporting part in managing the academic issue. Most participants mentioned Blackboard, the university's course management system, as one of the tools used to this end. For the students Blackboard became the primary source of academic information and resources and, to some extent, study-related online interaction. One participant commented that she used the forum feature of the platform to post questions and receive feedback from her classmates about academic matters such as writing assignments.

All the students had a mobile phone and a laptop, which in most cases they carried to lectures. Some used tablets as well. This reflects a tendency in mobile learning known as Bring Your Own Device in which students in general are using their personally owned portable devices to engage in formal education (Traxler 2013).

In addition to facilitating access to course material, these tools helped the participants to be organised and keep track of their academic duties. One participant, Anna, who mentioned using her phone all the time, commented: "My phone has my uni [sic] timetable on it. So, it is like: 'oh I'm free now; let's do this work now' or 'oh, I have a class; I have to go to this'. My phone is amazing."

Students pointed out the use of social media by academic staff to encourage discussion and collaboration. One participant mentioned that closed groups were set up on Facebook by her lecturer or class representative. For her, being able to interact online with other students about academic matters was a positive experience which helped in managing academic demands. Social media was also used as a personal learning environment. Another student, Bryan, indicated using YouTube to support "big study" and find additional information to complement what was taught in lectures. The findings show that the participants were not different from non-disabled students in the use of social media tools for informal learning and as a personal learning environment as shown by previous research (Gikas and Grant 2013; Martindale and Dowdy 2010). Like their non-disabled peers, the participants also benefited from using social media to manage academic duties.

The online group set up for this study via Facebook was also an additional tool used by the participants during the second action research cycle. Information and links posted on the Facebook group were selected based on participants' concerns raised during the group support meetings, and the conversations with staff of the Disability Services unit. All the participants agreed that our intervention helped them to deal with the challenges of the academic system. The comment below illustrates this point:

All the information that you posted there was all relevant, was all to do with university and transitioning and everything disability-related, not mattering if it is an intellectual, visual and any other disability. (John)

Reaching familiarity and confidence with the academic issue, with the support of technology, was for some students a signal of coping with transition. This is what Betsy said:

Regarding the academic stuff, I think I have definitely been able to understand the rules of university, how things work, how things function and to make the most of the opportunities here. I think I am definitely part of the system in that respect. (Betsy)

These feelings of familiarity and confidence among the participants might describe a sense of belonging – the subjective sense of affiliation and identification with the tertiary community (Hoffman et al. 2002).

Social connections

For the participants, building connections with peers from lectures and/or university accommodation was critical. Building new friendships allowed them to cope with feelings of isolation and created opportunities for academic support and/or collaboration. However, forming those connections was challenging and stressful for most participants, particularly at the beginning of the academic trimester. During the focus groups and interviews, participants remembered being nostalgic, feeling alone, and missing their old friends. When asked about this point Sam, who came from boarding school, commented: “Yes, a bit [isolated]. All my friends from school have moved on and I can’t see them which is kind of annoying.”

As building new connections on campus proved to be difficult, participants turned to their existing social ties for socialising and transition support. Marie commented that she often met with her high-school friends, who came to Name of University or Name of University in Wellington to “hang out and study together.”

Our findings also show that social media was a means of building and maintaining social connections, which complements research on the topic (Ellison, Steinfield, and Lampe 2007; Quan-Haase 2008; Yu et al. 2010). Like their non-disabled peers, research participants also incorporated different tools to support communication, and complement face-to-face social interactions with existing friends and new peers. They all had personal profiles on social networking sites such as Facebook and used apps on their mobiles such as WhatsApp and Messenger. For example, as described in the Method section, participants suggested using Facebook as a communication tool for the project. One participant, Betsy, commented that “the layout and user-friendly nature of Facebook makes it a more agreeable medium by which to communicate”. Other participants indicated that social media tools were “good on the phone” and made it “easier to follow the posts” on their phones.

While the literature highlights the need to teach social skills to students with disabilities (Bakken and Obiakor 2008), our findings suggest that students can nurture those skills through technology-mediated interactions. One participant explained how using social media allowed her to strengthen new social connections and cope with the challenges of the academic issue:

When I am in my room I open my Facebook and sometimes I find my friends saying: ‘oh, come to the study lounge tonight. We miss you. Come to hang out’. So, I pick up my stuff. I go down there and study with them all night as well as socialising. More socialising goes on when studying but I still get a heap of work done. (Anna)

Our intervention through the group support meetings also had a positive impact on helping participants to deal with the social connections issue. One student, Krysten, commented that being able to meet and talk with other students with impairments was helpful as this kind of experience rarely happens in classes. Social media was also used to complement face-to-face interactions that began in the group support meetings. The students used the Facebook group page to continue conversations, and then sent friend requests to each other. In doing so, these participants were coping with the social connection issue and building new friendships:

I actually made friends with a lot of them [participants] on Facebook and we actually talk quite often now. I talk with X a lot. He likes me on Facebook all the time. I talk with a lot of them. I had never met them outside of the group. I made new friends through the group and it was very helpful just asking people in the group about stuff. (Anna)

Available evidence on non-disabled students indicates that technology-mediated communication can enable the preservation and maintenance of social ties (Quan-Haase 2008). Our data suggests a similar pattern among students with vision impairments. Through their use of digital technologies, they seek to overcome the challenges of maintaining existing friendships while building a larger social network on campus. This behaviour, which included the integration of a range of tools for communication, also contributed to the development of a sense of belonging (Hoffman et al. 2002) among these students.

Impairment issue

Participants used terms such as “hindrance” or “barrier” to describe how their impairment was affecting their transition. Several students commented that they initially underestimated its impact on different academic tasks. They commented on spending more time reading course material than their peers without disabilities. Independent of the eye condition and level of functional vision, participants indicated losing concentration quite often, getting blurred vision, and/or tiring easily when reading course material. Such was the case for John, a student experiencing retinitis pigmentosa: “It is really hard to read. I get really tired when I read and it takes a lot longer. You actually have to read. You just can’t listen to it and comprehend it in your own fashion.” As a result, most participants had to drop some courses or change their enrolment status to part-time just after the start of the academic trimester.

Some participants also indicated that their impairment had an impact on building social connections. One of them, Bryan, with congenital diabetic retinopathy, commented that he had to remind his peers to say hello to him first because he could not see them properly.

All the students found in digital technologies a means to compensate for or minimise the impact of their impairment. For some, digital voice recorders were a useful tool. They employed these devices to record lectures and tutorials and then uploaded the audio onto their laptops or tablets for additional listening and

comprehension. Similarly, other participants used their smartphones to take pictures of the whiteboard during lectures. In terms of coping with the demands of course readings, access to eBooks was also mentioned as the participants found them easy to manipulate and enlarge.

While digital technologies were used for impairment compensation, participants still relied on assistive technologies:

I have OpenBook [scanning and reading software], ZoomText [magnification software] and I've also got a recorder to take to lectures as well...OpenBook and the recorder do help. I like OpenBook because I can look at the stuff that is there anyway and even if I am not reading it following it is enough. (Krysten)

Disability support

Provision of disability support services is highlighted as part of tertiary institutions' responsibility for and commitment to inclusion (Janiga & Costenbader, 2002). For the participants, access to these services was imperative not only to manage their impairment but also other transition challenges. Several participants highlighted that managing their impairment was harder in the university setting than in high school.

Most indicated that their decision on where to study was influenced, to a large extent, by the availability of adequate disability support services. For them, access to these services was a prerequisite for being independent on campus. As Betsy commented: "If I have the right things in place, if I have the things I need, I can be reasonably independent."

Most participants contacted the Disability Services unit before starting university. The support received consisted of electronic course material, note-takers, guidance for grant and benefit applications, exam preparation, and test and lab arrangements. If needed, participants received advice about, and training on, the use of online learning tools (e.g. Blackboard), and assistive technologies. A student who used technology-facilitated services commented on how they affected her transition:

Usually it takes half an hour to read a page. By using the technology that the University provides me, it takes me ten minutes to read it because it is really quick and fast and I am not tired afterwards which is really good because usually after reading something I have to go for a 20-minutes break to recharge and feel better again. With closed-circuit television it is like 'ah, I am not tired; let's read something else'. (Anna)

Our findings are consistent with similar qualitative research on students with disabilities' positive views of access to support services (Kendall 2016), but ours also uncover the role of technological tools as described below.

Digital technologies were the means used to access information, communicate, and arrange disability support, since participants were still prospective students. The majority of students mentioned that they referred to Name of University's official website for general information and contact details of specialised staff. One participant remembered that the website was where she became aware of the support offered to students with disabilities:

I looked out in the website and I got in touch with the Admission Office and I discussed with them the fact that I was vision impaired and I wanted to find out what support is available for people with disabilities at Name of University

before I definitely came here. I think the next person I spoke to was a disability adviser, who, even on the phone, was very helpful in getting things set up, even with the [Blind] Foundation. (Krysten)

Other digital tools complemented participants' access to university-related information. The unit provided each student with a copy of Discover Your Future, a DVD with pertinent audio-visual information regarding transition, and sent them email newsletters periodically. The unit also referred the students to its YouTube videos containing information about university life. Those who received the support of a note-taker in lectures pointed out how their learning experience was enhanced by receiving electronically information they were personally unable to handle in lectures. Anna was among those who received this support: "They email me notes weekly from the classes because it is hard for me to write notes for myself... having someone else in the class doing it for me really helps. I am like: 'oh, that's what they mean by that'."

The Disability Services unit also set up a Facebook page as an additional information and communication channel for students with disabilities. The decision was made after we presented to the unit our preliminary findings about participants' use of social media for transition. When asked about the decision, a staff member, Emily, concluded: "Where they [the students] are is where we need to be."

Family involvement

Family involvement and encouragement, mainly from parents, has an influence on the educational aspirations and attainment of tertiary students in general (McCarron and Inkelas 2006). Our research with students with vision impairments found a similar pattern – except for two students who were the first in their families to access tertiary education. The participants valued the advice provided by their parents and other close relatives, which informed their decisions about post-secondary education and where to study. In most cases, parents helped participants to seek information and contact support services. Some parents accompanied the students at least once to their first meeting with a disability adviser. Having their families involved in their transition made some participants realise there were other potential challenges such as facing financial issues:

They [my parents] wanted me to go like straight to university instead of having a year off or something. They wanted me to go [to Name of University] because it was close to home instead of going to Otago [University] and having like extra student loans. They preferred I save as much as I could. (Sam)

Once at university, family involvement remained an important source of support, particularly when participants struggled with academic, social and/or financial issues. As young adults, the participants sought independence; however, they still needed to consult their parents on key decisions, such as dropping a paper or changing subjects. In a few cases parents' involvement style was firm and strict. One student commented that in the first weeks of university she could not get along with her flatmate and wanted to come back home. She dealt with the situation after video calling her mother who told her to "grow up and get over it!"

Because most participants came from different regions, digital technologies played an important role as communication enablers. For example, at the beginning of the trimester when participants felt homesick, these participants primarily used video-calling applications such as Skype to communicate with their families regularly. Text messages on their mobile phones were also another communication method. Similarly,

when they wanted to discuss key decisions about university life (e.g. dropping a paper), they did so through their mobile phones and/or video calls.

Conclusion

This study looked at students with vision impairments' experiences of transition issues and how they used digital technologies to deal with them. Consistent with past research (Tinto 1993), our study shows that the academic and social connection issues have a significant impact on the transition experience. However, in contrast and more importantly, this study reveals that, like their non-disabled peers, students with vision impairments also engage with a range of digital tools to actively manage not only these but other issues: disability support, family involvement, and impairment.

This pattern of active engagement with digital tools has implications for the understanding of transition. During this critical stage of their university life, students with disabilities not only have to learn the skills for independent learning but also face the lack of personalised support they used to receive in high school (Janiga and Costenbader 2002). However, as this study shows, experience of and responses to these challenges are simultaneously a collective practice enabled by students' use and adaption of digital technologies. This point holds true when the participants used social media and mobile devices to learn, study, collaborate and work together on and off campus or when they used these tools to facilitate communication, and build and maintain connections, support, and trust with their new peers and old friends. Clearly, students with disabilities seek to manage critical challenges with the support of their friends and peers, both with or without impairments, rather than on their own. In doing so they incorporate digital tools they are familiar with.

Another key finding is the nature of transition issues from the perspective of the participants. In line with previous research, these issues make transition more challenging and stressful. Furthermore, our study shows how complex and interconnected these issues are. Although all students go through them, not all issues are experienced to the same degree, in part due to students' specific vision impairment. Transition issues are also interconnected because managing one helps the students to cope with another. For example, students who were able to make new connections simultaneously managed the academic system as they studied, supported and collaborated with their new network of friends. These findings provide tertiary institutions with evidence to assess whether their policies and services meet students' needs and to reflect on the role of digital tools, other than assistive technologies, for transition support. Likewise, these findings have implications for the field of education as they not only expand theoretical reflection on transition issues, namely Tinto's (1993) theory of student departure, but also help to holistically understand these issues in the context of disability and digital technologies.

There are valid concerns about the reproduction of structural inequalities for people with disabilities through digital technologies (Macdonald and Clayton 2013; Goggin and Newell 2003). However, taking them for granted without considering students' views and their personal and collective experiences ignores their agency and capabilities to integrate technology in their own way to manage transition and other aspects of their everyday lives. By exploring students with vision impairments' lived experiences, this study has found a group of students that interacts with technology for a range of activities. Like their non-disabled peers, they are not passive but active users who enjoy the affordances but also face the risks and challenges of digital technologies (Pacheco and Melhuish 2018).

Another implication of this study concerns digital inclusion. Much of the debate about this topic has centred on addressing the digital divide, mainly in relation to limited access to technology (Ellcessor 2010; Dobransky and Hargittai 2016). However, while access is still an important aspect, current reflection on this matter has extended to people's capabilities to use technology as well as its use for participation in society (Starkey, Sylvester, and Johnstone 2017). In our study, participants not only showed their ability to use digital tools but also how their interaction with them enables participation in and engagement with university life. As technology use is pervasive among young people (Anderson and Jiang 2018; Pacheco and Melhuish 2018), our evidence suggests that enhancing skills and capabilities might also be critical to support students with disabilities' inclusion in higher education.

This research included students with a number of permanent eye conditions under the umbrella of vision impairment; hence a limitation is that none of the participants was totally blind. Despite drawing from varied data sources, this study is highly contextual, and its findings cannot be generalised or replicated in other tertiary settings. However, the range of transition issues identified here can be used as a lens for the study of other student groups, and in other tertiary settings. Furthermore, as digital technologies continue to evolve, so will young people's engagement with them. Thus, future research might look at recent innovations such as wearable technologies and whether they support students with disabilities' learning and transition experiences.

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