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Shining a light on disparities to access. Specialist teachers' perceptions on the impacts of COVID-19 restrictions on learning for students with blindness and low vision in Australia, New Zealand, and the Pacific

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ABSTRACT

COVID-19 restrictions have had significant impacts on teaching and learning globally. A growing body of literature has been published on the experiences of students and teachers as they negotiated school closures and social restrictions. Much less has been published about the experiences of students with disability, and very little about students with blindness and low vision (BLV). The impact of BLV on learning is significant due to the visual nature of the curriculum. To address the dearth of research on how COVID-19 restrictions impacted educational access and participation for students with BLV, the authors, supported by a research grant through the South Pacific Educators of Vision Impairment (SPEVI), surveyed and interviewed Specialist Teachers of students with BLV in Australia, New Zealand, and Small Island Developing States (SIDS) in the Pacific region, that is, the region that encompasses SPEVI's work. The results bring teachers' voices into the collation of strategies to inform future educational responses. These are presented as a series of six key catalysts or drivers for change over four stages of action; moving through times of crisis that necessitate remote teaching and learning or other fundamental shifts in practice due to crisis-driven changes.

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Introduction

With the rise of COVID-19 globally, 2020 proved to be a year of confusion, distress, and concern for many. The impact of COVID-19 on teaching and learning was acute and significant (Flack et al. 2020; Kim and Asbury 2020). In 2023, the sustained effects continue to impact students' academic progress, social relationships, and mental health. For students with blindness or low vision (BLV) unique educational needs arose due to modifications required to successfully access and engage with the curriculum which is, by default, visual in nature (Cain and Fanshawe 2021). The range of studies investigating

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how teachers and students experienced restrictions and school closures (Cain et al. 2021; Cain and Fanshawe 2021; Naylor and Nyanjom 2021) have provided clear implications for students BLV and future practice. What these studies tell us is that students who had access to, and the knowledge to use computers and the internet and students who had sufficient home support were able to access curriculum materials successfully (Cain and Fanshawe 2020). In fact, Heyworth et al. (2021) found some students thrived during remote learning as this change removed some of the social and sensory pressures normally associated with school settings. But there were many students at all levels of education for whom barriers to learning were at times insurmountable. Teachers also experienced angst due to increased workload, managing student anxiety, and negotiating parental involvement, leaving them with a greater counselling role than they had expected and were prepared for (Cain and Phillips 2021; Huber and Helm 2020).

Within this emerging global investigation there have been limited studies which focus on the impacts on students with disability, with most publications exploring barriers to accessing therapeutic activities and medical services, and on family stress levels and overall wellbeing (c.f. Dickinson and Yates 2020; Tremmel et al. 2020). Studies on learning and academic achievement are sparse. In the area of sensory impairments more specifically, there is a dearth of research on how the education of students with blindness or low vision (BLV) have been affected in countries which have experienced restrictions and school closures, and the envisioned impacts and anticipated solutions in those that have not. The limited publications address very generalised concerns around teachers' abilities to translate reasonable adjustments into the online space and ways to make remote learning accessible.

In response to this substantial gap in the literature, the authors conducted a survey and interviewed Advisory Specialist Teachers (ASTs) of students with BLV. Participants resided in Australia and Small Island Developing States (SIDS) in the Pacific region, including areas (at that time) which were yet to feel the impacts of COVID-19. This study was financially sponsored through a South Pacific Educators in Vision Impairment (SPEVI) members' research grant, which sought to bring teachers' voices from Australia, New Zealand, and the Pacific Islands into the collation of strategies to inform future educational responses. The results are presented in this article as a series of key drivers or catalysts for change which form a model for successfully negotiating learning during *any* period of abrupt and unexpected change. The model details key learnings over four stages of response from which to build a longitudinal foundation to support responses to future health emergencies and natural disasters. To provide context around the results and analysis of the data, a review of relevant literature is presented in the following section: global experiences of COVID-19 on teaching and learning, impacts of school closures and restrictions on students with disability, and impacts on learning for students with BLV.

Literature review

Global impacts of COVID-19 restrictions on learning

The ongoing investigation into impacts on learning resulting from COVID-19 restrictions highlights concerns of teachers, students, and parents that fall under two major

themes: technologies and relationships (Cain et. al. 2021; Cain and Fanshawe 2021; Naylor and Nyanjom 2021). Both themes magnify existing entrenched sociocultural injustices leading to inequitable access to learning. For example, some students had computers and access to the internet, some had experience with negotiating applications and programs, and some had family members to turn to when they needed support or troubleshooting. But many did not. Aside from technological challenges, there were students who had parents who were either unable, unwilling, or felt they were not capable of supporting students in their learning, along with family members who had lost jobs or were sick and needed care themselves. As such, concern for vulnerable students became teachers' greatest focus, taking priority over the transmission of curriculum content (Cain, Fanshawe, and Goodwin 2021).

Kim and Asbury's (2020) research with schoolteachers in the UK suggests that this issue of 'the haves and have-nots' serves to make more visible the experience of disadvantaged and vulnerable students. They suggest that the pandemic highlighted 'broader problems that were always there, just hidden' (12). The Pivot Report (Flack et al. 2020) detailed the three top concerns of 3,500 teachers from Australia and New Zealand across all school sectors during the move to online learning. The most common concerns were about students' social isolation, a decrease in student well-being, and the loss of learning. Respondents expressed anxiety about a lack of social connection with their students and a decrease in the effectiveness of their teaching practice. Teaching is inherently a social practice, and 'care is integral to successful teaching' (Cain et al. 2023, 1237). These studies suggest that the ethic of care and the subtleties of social human interaction are, however, more difficult to experience online.

Impacts on learning for students with disability

Among the research to date, there have been limited publications on how COVID-19 restrictions have affected students with disability. A national survey conducted by *Children and Young People with Disability Australia* (CDYA) highlights the affects of COVID-19 on children and young people and their families (Dickinson et al. 2020; Dickinson and Yates 2020). Only half the respondents reported that accessible learning experiences and individual adjustments were available to their child when learning from home. Additionally, half of the respondents noted a decline in mental health for either the child and/or their family. Parents' greatest concern was that their children would lose educational gains made in the classroom. In contrast, there has been some indication that for students with Autism Spectrum Disorder and debilitating anxiety, learning from home may have been the preferred method of engagement (Heyworth et al. 2021; Phillips et al. 2021).

A report by Tremmel and colleagues (2020) details how capitalising on ways of working utilised by rural special education schools in the Commerce Independent School District in Texas, resulted in successful transitions to distance learning and useful recommendations for future closures and restrictions. These schools prioritised well established family-school-community relationships, focused on quality and continuing professional development, and kept strong and open lines of communication through the changes which served to 'mitigate feelings of uncertainty and anxiety' (202). Each day included time for parent communication, individual student counselling, socio-

emotional learning, and teacher training. Clear and consistent collaboration with all stakeholders worked to meet the needs of the community.

These studies highlight the essential role that parents play in supporting their children when learning at home. The need to collaborate with parents of students with disability even before COVID-19 (Cain, Fanshawe, and Goodwin 2021; Lavani 2015) was more prominent from when lockdowns began in March 2020. Recent research indicates a significant need to bolster parents' skills and beliefs about their ability to positively influence their child's academic outcomes in home-based learning (Al-Dababneh 2018). In many cases, not only do many parents lack confidence in supporting their child's learning in the home environment, but teachers often lack the ability to work effectively in inclusive communities in general, and how to utilise the valuable support role that parents can play (Cain, Fanshawe, and Goodwin 2021; Forlin and Hopewell 2006).

Impacts on learning for students with BLV

Interactive technologies hold the potential for greater equity of access and can be adapted to the sensory and cognitive needs of individual students (Metatla et al. 2018). These technologies can also become significant barriers if learning activities are designed without accessibility in mind. A plethora of research suggests that the majority of teachers have grossly insufficient skills in differentiating content and processes for students with disability and have limited or no understanding about differentiating for students with BLV (Cain, Fanshawe, and Goodwin 2021; Round, Subban, and Sharma 2016). In the Australian context, most students with BLV have ASTs who visit schools to support classroom teachers to make appropriate adjustments so students with BLV can access the curriculum successfully (Brown and Beamish 2012). The curriculum, of course, is not just about learning content and skills. Cain and Fanshawe (2021) have analysed the needs and expectations of students with BLV in mainstream educational settings and found that to ensure authentic inclusion 'the multidimensional needs of the learner (academic, social, emotional, behavioural, and physical) must be addressed' (xxx). Wilkinson (2020) highlights that people with BLV already experience loneliness at higher levels than the general population and as such, additional attention to socioemotional needs should be a priority.

Battistin and colleagues' (2021) reported on the successful Distance Support Project (DSP) developed during COVID-19 lockdowns in Italy. This project involves approximately 350 students aged birth to 14 with a severe vision impairment supported by the Robert Hollman Foundation. They noted that online teaching and learning was a completely new experience for Italian educators, students, and parents alike, and so the team took a proactive approach to explore a range of new technological resources and acquire new skills and innovative online intervention practises. Features of the programme included regular audio-video support calls and meetings with parents, analysis of videos of child development sent in by families, and professional assistance for parents and educators in the acquisition of new skills and the use of e-platforms and devices. A home cooking group was also established. Importantly, parents were offered online psychological support if needed.

In contrast, Walker (2020) reported on an example of how the practicalities of inclusive education during COVID-19 restrictions negatively impacted students with BLV.

Walker reports that schools routinely violated provisions of students' requirements, including providing braille materials that were erroneous, delayed, or non-existent, and the use of inaccessible software and websites. As many teachers in Australia would attest, the transition from in-person instruction to at-home learning should be relatively easy if accessible materials and assistive technology are provided for home use. That they were not, suggests Walker (2020), is the result of ignorance, a lack of teacher knowledge and training, and government's neglect to follow through with educational policy.

Methodology

This paper presents the results of one section of a larger study on the impact of COVID-19 restrictions on learning; specifically the responses from ASTs. Experiences of students, parents, and classroom teachers prior to the impact of COVID-19 have been reported previously. This study was conducted between February and October 2021 and was financially sponsored through a grant from SPEVI. The aim of the study was to determine the impact of COVID-19 on learning for students with BLV as described by their teachers in Australia, New Zealand, and Small Island Developing States (SIDS) in the Pacific. Human ethics approval was gained through the first author's university.

Research design

As the aim was to document teachers' journeys as they managed the abrupt and unanticipated changes during COVID-19 restrictions, qualitative methodology was chosen to be a suitable fit (Calman et al. 2013). The research was designed to include surveys to elicit an understanding of teachers' journeys, and semi-structured interviews to explore topics in more depth (Ruslin et al. 2022). Surveys were created using Qualtrics, an online survey platform, and conducted between February to May 2021. In order to ask pertinent questions regarding education modifications, two surveys were designed, which enabled questions to be customised according to whether the participant countries had or had not been impacted by COVID-19 restrictions. This data were required as part of the funded study to suggest how nations who remained unaffected by COVID-19 learnt from nations who experienced closures and restrictions earlier. The surveys consisted of 15 questions which centred around equity of access, the social, emotional, and academic impacts on student learning, and key sources of assistance for teachers. The survey questions offered text boxes for written responses with unlimited characters.

Participants were also invited to engage in a 30-minute semi-structured interview during April and May 2021 to make further meaning of participant experiences. The interviews focused on capturing narratives of practice: what changed in the educational and broader settings and how educators responded, how equity of access fared when restrictions were in place, and most importantly, what key learnings came out of their experiences.

Participants

The research centred on ASTs who are trained to support classroom teachers to implement differentiated instruction to support students with BLV (Brown and Beamish 2012). AVTs were recruited due to their in-depth knowledge of education for students with BLV and influence across multiple school contexts. An invitation to participate in the survey was sent out by email to all members of SPEVI who taught students in Australia, New Zealand, and Pacific SIDS. Survey participants were provided an information letter which specified that their participation was voluntary and that they would not be identifiable in any reporting of the data. Participants provided their consent by choosing to proceed with the survey. From the two surveys, there were sixteen responses. Fifteen participants had completed the survey indicating they were impacted by COVID-19 restrictions. Of these, seven participants were located in Australia, three in New Zealand, and five from Pacific SIDS. Only one participant (located in Australia) completed the survey for those who had not been impacted by COVID-19 restrictions. Responses represented approximately 20% of SPEVI members, which according to McNeish (2017) is an acceptable response rate in educational research and which may offer rich empirical evidence.

For the interviews, purposive sampling was used to contact ASTs through SPEVI networks with the intent to collect a diverse array of teaching experiences in varying geographic contexts. Interviews were conducted with nine participants working in Australia, Fiji, Papua New Guinea, Vanuatu, and Kiribati. All interviewees had completed one of the surveys. All participants worked in mainstream educational contexts except for the participant from Kiribati who worked at a school for students with disability.

Data analysis

Data was analysed through inductive category development (Mayring 2000) using 'Trello' an online collaboration programme. As the researchers uploaded the data from the surveys, they added Trello 'cards' with empirical data from survey questions which were moved around into themes, with formative checks made by the number of cards within each theme. Interview data was then coded and the researchers discussed patterns in the interview data to finalise themes. When coding the data into themes, it was apparent that factors which influenced access to learning during COVID-19 (student context, support from ASTs, support from family, provision of accessible content, technology, and preparation) were aligned with the Bioecological Systems Model developed by Bronfenbrenner and Morris (2006). This model acknowledges the importance of a system of relationships encountered in multiple environments in understanding child development. McLinden et al. (2016; 2020) used a Bioecological Systems Model to promote a balance in the structuring of educational environments to ensure 'access to learning' whilst promoting the acquisition of specific skills leading to increasing independence, or 'learning to access'. Similarly, Fanshawe (2021) used the Bioecological Systems Model to map the factors which impacted learning for students with BLV in mainstream secondary schools (Figure 1). This model was used by the authors to conceptualise the data being provided by participants.

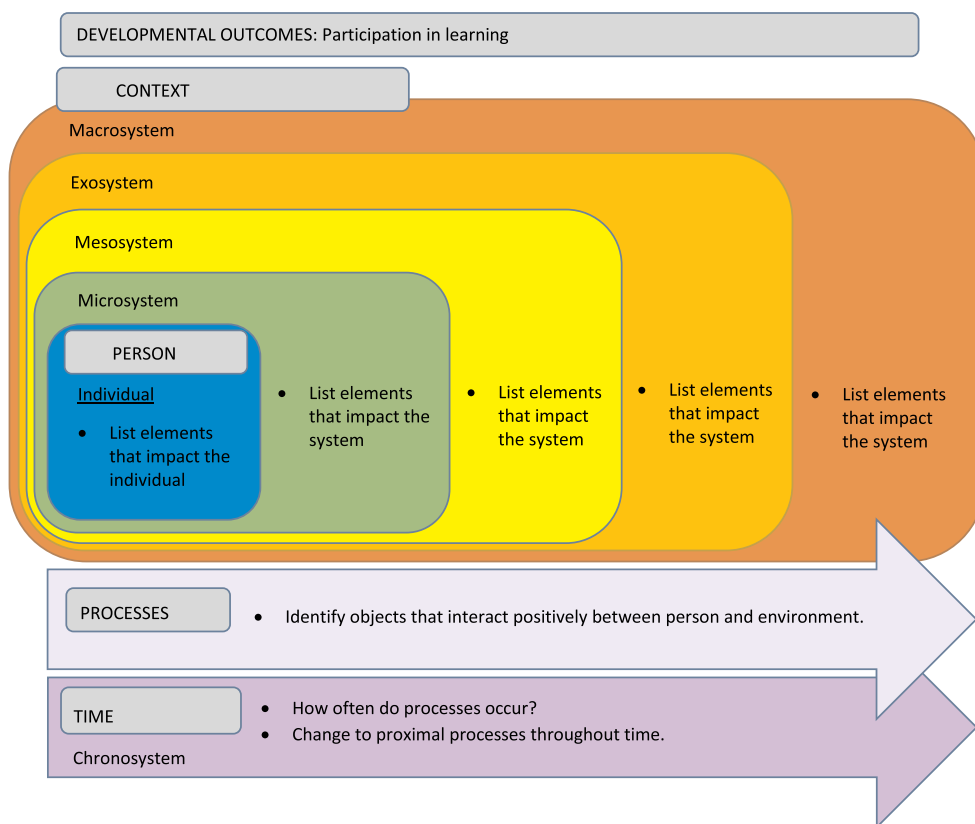


Figure 1. Adapted bioecological systems model.

Extending the work of Bronfenbrenner and Morris (2006) Fanshawe's (2021) model acknowledges the individual, along with contextual affordances within the environment. Additionally, the model recognises *processes* and *time*, which are identified in the bioecological systems (Bronfenbrenner and Morris 2006) as impacting students regardless of the individual's context.

Results

With Fanshawe's (2021) model as an overarching guide, the results are presented identifying with reference to the context of the student, along with affordances within the meso and micro systems which impacted access to and participation in learning. *Processes* (i.e. factors that interact positively between the person and their environment regardless of context) and the impact of *time* both chronologically and by length of engagement in the processes are also presented.

Student context [Macrosystem, exosystem]

How an individual's *macrosystem* (sociocultural factors such as values and traditions) and *exosystem* (factors that do not impact students directly but have consequences for

students' development and learning such as political and economic systems) influenced education became more apparent during restrictions. In the countries surveyed, it was reported that students with disability were disproportionately impacted.

Geographic location was identified as impacting access to education for students with BLV. Interviews with ASTs in Pacific SIDS revealed that students with BLV were spread out over large geographical areas. Thus, providing adequate support for all students with BLV was difficult even without the impact of COVID-19 restrictions. *'In the capital city most of the students are now receiving assistance. But not in the islands. We are trying our best ... but some islands don't have any airplanes, they don't have telephones, they don't have internet. [Pacific SIDS]'* Similarly, an Australian AST located in Central Queensland reported that they had large caseloads of students living in multiple distant locations, making access to their students considerably more difficult and intermittent.

Participants related that in cultural terms, disability is often viewed as the result of cause and effect and results in shame for the individual and family. An AST from Pacific SIDS explained, *'there is a diminished belief in the capacity of children with a disability and limited access to rights and education. We know that there are a lot of children who are vision impaired who have never had a chance to go to school'*. Cultural beliefs around disability meant that education was not prioritised for students with BLV in some Pacific SIDS and particularly during COVID-19 restrictions.

In the Pacific SIDS surveyed the rights of students with disability are not widely known. One major barrier was not having a curriculum that is designed to be accessible for every student. *'I get asked this a lot in the Pacific. 'Can you give us a curriculum for the blind?' I say, the blind can have everybody's curriculum. The curriculum is not the problem. It's the teaching. That's the barrier'* [Pacific SIDS]. There appeared to be limited training for teachers in the fundamentals of inclusive practice, so working with cultural attitudes to disability can be challenging. As reported by an AST, *'We've taken a "slowly, gently" approach [to] working on attitudinal change. [Pacific SIDS]'* However, participants described many positive examples of how inclusive practice is expanding *'We've got over 20 teaching assistants spread across these model inclusion schools. We've done lots and lots of training'* [Pacific SIDS]. In another Pacific SIDS, an inclusive education teacher network has been established. Further, an AST detailed how they visited a school where a student with BLV had been asked to leave as the school did not know how to assist the student:

[the Principal said] 'We are not trying to move him out, it's just that we don't know how to deal with him'. I said, I am willing to come and run some training in your school. The Principal asked me if I'd go there once every month because he really wants all the teachers to have capacity to help students [with disability]. [Pacific SIDS].

Further, within the Pacific SIDS, gender played a role in ways that was not evident in this research in more developed nations like Australia. It was reported that *'girls in developing countries with a disability miss out on education. So, they are twice as disadvantaged. [Parents are] far less likely to invest in school for their daughters when they have to pay school fees, bus fare, and uniform costs'*. These insights indicate that contextual factors such as sociocultural values can impact the way education is delivered for students with BLV.

Additionally, access to schools during COVID-19 varied as a result of the way health and education policies were enacted. Most Pacific SIDS closed their borders early and kept COVID-19 at bay. Therefore, for students who normally attend school their absence from the classroom was not prolonged, but instruction ceased the minute schools closed, *'There's no teacher support. There's no learning. They just basically went home'*. [Pacific SIDS]. Even when Pacific SIDS schools resumed not all students were permitted to return: *'the sighted kids returned, but any child with a disability was not allowed to return because [the government] said that they were more vulnerable to COVID'*. In Australia however, school attendance for some students with disability was prioritised; *'vulnerable students, including students with BLV were eligible to attend school even when their peers could not. However, not all of them did, due to health concerns'*.

Additionally, Pacific SIDS share fragile ecosystems and susceptibility to natural disasters. In April 2020, Tropical Cyclone Harold created significant damage in several Pacific Island nations at the same time as the first effects of COVID-19 were felt. A teacher reported; *'Cyclone Harold meant schools were locked down for much longer. We actually called it 'COVID 19/TC Harold' response. We managed that response to this natural disaster plus the pandemic'* [Pacific SIDS]. Natural disasters further compounded issues of access to education for some students with BLV in Pacific SIDS.

Within the *macrosystem* and *exosystem*, ASTs identified contextual factors such as cultural norms and geographic location as impacting participation in learning during the pandemic. Additional cultural factors such as conceptions of disability and gender norms also influenced access to education during this time, as did the country's vulnerability to natural disasters. The intersectionality of a range of sociocultural factors serves to highlight the complexity and impact of the students' context in addition to BLV.

Support from and for families and community [Microsystem]

Within the Bioecological Systems Model (Bronfenbrenner and Morris 2006) the micro-system is considered to consist of people who play an immediate role in the lives of the student. For students with BLV, families as default educators were identified as playing a crucial role in supporting online learning. The ability of parents to support their children emotionally and academically, their belief in their child's ability to succeed, familiarity with access needs and availability of devices significantly impacted a student's participation in learning. Results demonstrated that some parents and community members were able to support students with BLV learning from home, but for students whose parents were not able to assist *'the equity gap became more obvious. You could have similar children, similar skill sets, same disability, yet two very different home environments ... impacting whether they are learning or not'* [Australia, no state identified]. For example, it was reported by an AST in the Pacific SIDS that students with BLV *'really got affected because most of our parents are illiterate. Also, the parents are busy working, so the students got to stay home and [try to] do the work themselves'*. Similarly, ASTs from Australia also described the impact of working parents and their ability to oversee learning during this time; *'for the educational success of children with a disability, it's the commitment and dedication, and [the parents'] education level and belief in education'*. All ASTs identified differences in capabilities and willingness of parents and carers to support the specific educational needs of students with BLV.

Interestingly, some ASTs indicated that prior to COVID-19, they had not had any direct interaction with their students' families; *'we haven't ever really targeted parents because we don't have those communications with parents'* [Victoria, Australia]. This prior lack of communication meant that many parents had little awareness about how to support their children when learning from home. It was reported by an AST in New Zealand that many parents or carers had limited knowledge about accessibility options or were not able to read braille, which would influence their ability to support their child.

In the Pacific SIDS, ASTs made tremendous efforts not only to provide resources to students, but also assistance to families, sometimes in multiple languages: *'[There] were disability-specific take-home learning packages. They were printing out hundreds and hundreds of pages and putting them together for individual students [because] there was no online learning, no Zoom, no internet. Taking them into the villages and giving them to the families for them to [do] with their children. [Pacific SIDS]'*. Another AST reported *'we had a whole series of text messages translated into [the lingua franca] and circulated through the whole mobile phone network. We also developed a series of parent information sheets on how to help your child; tips and strategies'* [Pacific SIDS]. ASTs highlighted that a key element in students' progress during COVID-19 restrictions centred on parents' ability to support their child's learning.

As such, ASTs in Australia did what they could to support parents and carers. *'The advisory teachers were usually pretty good at reaching out to parents individually. Many commented on how they felt that they bonded a lot more with families during this time'* [Queensland, Australia]. As a result of the increased interaction, it was reported that *'families grew in their appreciation of what teachers do for their children. Many families gained a more realistic idea of their child's impairment'* [Victoria, Australia]. Several ASTs indicated that they hoped the increased communication would continue; *'it's been quite a learning experience for professionals to realise that we really need to collaborate more with parents, because if there's another one of these emergencies, parents have got to have the skills and knowledge to be able to support their kids at home. [Victoria, Australia]'*. The recognition that increased parent-specialist communication and partnership building within a student's *microsystem* were advantageous outcomes of changed learning practices during COVID-19 restrictions.

Support from and for advisory specialist teachers [Mesosystem]

The mesosystem is considered to include the interaction between two or more microsystems (Bronfenbrenner and Morris 2006). ASTs were identified as interacting between home and school during COVID-19. The professional lives of ASTs themselves were impacted in diverse ways. In several Pacific SIDS, learning ceased completely. As mentioned in the previous section, Pacific SIDS are quite spread out geographically. Schools tend to have less reliable telecommunications and internet services, which meant communication by ASTs to students on their caseload was limited. In many schools within Australia, the assumption was that learning would simply be moved to the online space. One participant explained that when school closures were announced, the onus was on ASTs to ensure online learning was accessible for students with BLV. *'I put in a lot of time with my [classroom] teachers in the beginning teaching them how to*

make accessible content, because all the content was being put on Google Classroom that wasn't accessible'. [NSW]. As such, classroom teachers gained new insight into the essential nature of what ASTs provide: 'People are more open [now] to having the advisory teachers come and give assistance. They realise that after having to teach online. Also, that providing accessibility from the beginning would have been beneficial. [Queensland].

For students with access to internet and computers this was achievable, but for students who returned to rural or remote residential locations without good internet, reduced access to ASTs. An AST in Queensland, Australia reported that access to Indigenous communities during COVID-19 was very limited. *'In Aboriginal communities they might be using a satellite dish or they go to the local library that has a hotspot or something. They don't have good internet'. Participants indicated that access to support from ASTs for students with BLV was determined by access to communications throughout this time.*

Nevertheless, ASTs also identified advantages to online learning during COVID-19.

So, my day looked very different, but it was actually very, very productive. I spent a lot more time with my senior student than I thought I would have. I felt like I actually had the space in the day to talk about those areas that we really needed to focus on, those explicit core curriculum skills. That was so much better during lockdown. I'm REALLY missing it! [NSW, Australia].

Online service delivery by ASTs during lockdowns meant that some teachers would travel less which consequently increased the time they could work with their students.

Support for ASTs was provided by collaborative groups such as South Pacific Educators in Vision Impairment (SPEVI). An AST from Victoria, Australia reported that *'SPEVI started having very regular 'Community of Practice' meetings to try and address some of the concerns. It highlighted that ... there were these real concerns with online issues. Now we've learnt things that we can take these into the future'. Learning new skills about how to work online to support students with BLV was seen as an advantage for the ASTs.*

While advantages were identified by some Australian ASTs, in the Pacific SIDS surveyed less comprehensive teacher training and limited knowledge about accessibility meant that ASTs needed to approach their work somewhat cautiously. *'Regular schoolteachers ... they don't see it as their role to deal with special education needs. They leave everything up to the support teacher. So, there's very little interaction between the regular schoolteacher and the student'. Cultural attitudes toward disability and inclusivity the Pacific SIDS meant that if students did not have access to ASTs, they may not receive essential adjustments to effectively access the curriculum.*

The way ASTs provided support changed from visiting schools and providing in-person support pre-COVID-19 to making content accessible online to suit the needs of classroom teachers and students. In addition, the development of a new Community of Practice introduced ASTs to new ways of working to suit the changed conditions.

Access to learning and provision of accessible materials [Processes]

Within the Bioecological Systems Model (as shown in [Figure 1](#)), *processes* identify objects that interact positively between the person and the environment. Access to learning and

provision of accessible materials as well as access to and familiarity with digital technologies were identified as processes that impacted learning opportunities for students with BLV during COVID-19 restrictions. Despite some students with BLV having access to ASTs and support from families, access to learning was still only possible when students had accessible materials.

Participants explained that success in online learning was often determined by classroom teachers' knowledge of what students with BLV needed, making this a time of stress for ASTs. As classroom teachers scrambled to provide remote learning experiences for their students, accessibility needs were not always viewed as a priority; *'they were just so overwhelmed that they weren't thinking about the diversity'* [Queensland, Australia]. This is where ASTs came to the rescue. Firstly, they prioritised getting curriculum materials into students' homes so they could continue to learn. *'I basically just said, let's get in and get these kids devices ASAP!'* [NSW, Australia]. In some Pacific SIDS, the immediacy of school closures acutely impacted accessibility; *'because it all happened so quickly, there was no coordinated response. The support teachers weren't able to liaise properly with teachers on making documents accessible. Because [schools] shut so quickly, we were not able to have students borrow laptop computers with braille machines'*. ASTs explained that they made many adjustments to ensure access to the curriculum, by *'doing what they could with what they had'* [Pacific SIDS].

The ways in which ASTs responded during COVID-19 will assist them preparing for future emergencies. For example, the provision of Inclusive Resource Kits for students at home were utilised in the Pacific SIDS. These had a range of items such as a magnifying dome, tactile ruler, and braille books which provided access to curriculum materials. Another Australian AST described the proactive planning that had benefited her student; *'He had a Polaris [braille keyboard] at his house. He had hard copy braille books that we had organised, and we use the 'Ozzie Dots' program as well. Then we had math booklets that we produced well ahead of time with the idea that if we did go into lockdown that he could just continue on'* [NSW]. By considering what support might be required to access curriculum materials, ASTs were supporting students learning in a practical manner.

ASTs reported they were not always successful in being able to provide accessible learning materials. An AST from Australia shared that *'one student with complete blindness was in year 4 when we first went into lockdown. He'd only just arrived in Australia. He is a refugee from Iraq, so he didn't speak English and he didn't know what braille was'* [NSW]. As this student had limited understanding of the English language and had not been previously taught braille in home country, his access to the curriculum materials were limited during lockdown. Not having access to the curriculum in the preferred way of communicating meant this student was unable to access the same learning materials as his peers during this time. These experiences demonstrate that access to materials played a crucial role in online learning. ASTs moved quickly and tried to make curriculum materials accessible, however, this was not always possible for all students.

Access to and familiarity with technology [Processes]

The data revealed that students' access to and familiarity with digital technologies significantly influenced their participation in learning. This depended greatly on whether they

had been using digital and assistive technologies prior to school closures. Students who did not have access to technology found online learning more difficult; *'students that aren't good at technology or don't have access to technology have not gone so well'* [Queensland, Australia].

A number of respondents from Australia also shared that some schools were able to put the curriculum online. Assuming the curriculum was accessible contextual factors such as socioeconomic status may impact the technology needed to interact with the curriculum online. It was reported by an Australian AST *'there were schools in low socioeconomic areas where they didn't have access to digital technologies. They were sending out paper copies to everybody, but they were all the same. So [students] then had to go 'can we have access?' And by then the lessons were already over. The preparation wasn't really thought about.'* [Queensland].

One participant explained that while online learning platforms appear to be intuitive, generally this is not the case for students with BLV who are dependent on adaptive technologies. *'[There was] a bit of a lag in access to learning materials, participating in class discussions, knowing the chat field, 'hands up', 'hands down' – it's far more visual'* [NSW, Australia]. ASTs shared examples of students who fared well as they had what they needed and were prepared, *'Access to learning for any student with a disability has been harder during studying remotely. For students [with BLV], who are well resourced with their own adaptive technology and have all of the [skills], they're reasonably independent and can survive'* [Australia, no state identified]. Another Australian teacher in Victoria, shared similar positive experiences from students with BLV participating in online learning. *'We've noticed [that] the kids that have good technology skills have loved home-schooling because they have all the technology at their fingertips and they're not under the pressure of completing their work within the period of a lesson'*. An AST shared an example of a student in year 10 (15-16 years old) who preferred learning online due to the continuity of relationships and specialist instruction prior to the pandemic. *'I've had him since he was three years old. He was in a great position for lockdown because he has already been accessing everything online. And that content was created before we knew we're going into lockdown'* [NSW, Australia]. Some students who were used to independently accessing materials in an online format required less assistance. It is possible that they fared better than their sighted peers with less experience in negotiating digital technologies; *'the kids [with blindness] felt more confident to get on and do their work. They could adjust things for themselves, and they know how to do that when it's given in digital format. My kids with moderate vision impairment seem to still [prefer] hard copy print if it's given to them'* [NSW, Australia]. These students had familiarity with technology which assisted online learning during COVID-19 restrictions.

In some parts of Australia, priority was given to providing students with BLV access to technology that had not previously been offered. An AST in Queensland reported *'the funding requirements for assistive technology [were met], because suddenly something that may not have been necessarily used in the face-to-face environment became critical in the digital environment. I had schools bend over backwards to try and get devices to our kids'*.

In the Pacific SIDS surveyed, however, reliance on digital technologies to support remote learning was not an option; *'the majority of schools ... don't have the capacity and the technology ... because they need quick connectivity to be able to produce anything*

online'. A creative alternative for reaching supporting students was described, through the development of scripted radio segments in a variety of languages; *'our programme bought two radio segments a week. [The aim] was promoting disability inclusion'* [Pacific SIDS]. These examples demonstrate that innovative use of available technologies supported students with BLV in accessing the curriculum.

Participants described that *processes* such as access to curriculum materials, either through provision of materials in an accessible format or through knowledge and use of assistive technology were important to ensure participation in the curriculum during COVID-19.

Preparation for interruptions to learning [Chronosystem]

An important characteristic of the Bioecological System's Model (Figure 1) was the addition of the Chronosystem, which enabled the consideration of time, both in terms of how often the processes occur, but also how they change throughout time (Bronfenbrenner and Morris 2006). For students with BLV during COVID-19 this related to how often they were able to participate in learning either through provision of accessible materials, or through use of assistive technology. Importantly, this also includes thinking about future interruptions by learning from past experiences. Therefore, an important question in our survey was: 'knowing what you know now, what should you have done in preparation for the move to remote teaching and learning?' In retrospect, all stakeholders had learnt from their experiences during COVID-19 restrictions and had recommendations.

The main message from participants, was the need to proactively plan for similar situations. One AST explained that *'the communication needed to happen before to pre-empt emergency situations'* [Pacific SIDS]. More specifically, disability-inclusive emergency planning was needed. *There's a lot of money going into preparing for [disasters], but it's not disability inclusive.* [Victoria, Australia]. As emergency situations are not rare, effective planning should therefore be routine; *'In Australia, we have emergency situations all the time – floods, bushfire, drought ... you know that there are going to be situations that impact on education. [And yet] they were trying to play catch-up as the pandemic happened, especially in those first few months'* [Queensland]. Despite being aware of potential natural disasters, participants indicated that they were not realistically prepared for the physical and psychosocial impacts of health disasters such as COVID-19.

[We need] more collaboration with parents and caregivers to make sure they have knowledge and skills to support their kids in the next emergency. Collaboration with schools to make sure they choose an accessible platform for home learning. And training in tech skills so that students are able to transition [seamlessly] during emergencies to online learning [Victoria, Australia].

Established relationships with families and pre-planning around roles and responsibilities would have assisted greatly. Additionally, more that could have been done at the systemic level, *'It would have been very useful for the Ministries of Education across Australia to have collaborated on what platform schools should be using and to implement the infrastructure and the training around those platforms so that the teachers were equipped to transition ... rather than each school choosing a platform which they just guessed might*

work' [Victoria, Australia]. ASTs suggested that use of existing structures would have saved time and effort; *'Australia has an amazing network of schools of distance education, and they're all aligned to the Australian Curriculum. I believe very strongly that [this system] should have been opened up for everybody rather than all of the teachers trying to create their own content'* [Queensland, Australia]. Participants explained how preparation for interruptions to learning would have benefitted students and teachers during COVID-19 restrictions and should be considered as part of preparation for future events that may occur.

In sum, the findings revealed contextual affordances that impacted participation in learning for students during COVID-19. These included cultural norms and education policies in the *macrosystem* and *exosystem*, along with support from and for ASTs and families in the *mesosystem* and *microsystem*. Additional *processes* were identified which included access to learning and provision of accessible materials, along with access to and familiarity of technology. Finally, preparations for interruptions to learning were considered within the *chronosystem*.

Discussion

This discussion synthesises findings of the results in the order they were presented. The impact of broader contextual factors within a student's *macrosystem* and *exosystem* is, perhaps, best illustrated by this quote from an AST: *COVID has shone a light on the disparities in equity access – the 'haves' and the 'have-nots'. Some kids seem to manage, and some didn't. But once the pandemic hit, suddenly you had much more awareness of the disparities* [Victoria, Australia]. As a general rule, the impacts of prevailing disadvantage were amplified during this period, however, for students with BLV, additional barriers to learning existed only during COVID-19 restrictions. Geographic location and socioeconomic status were seen to play an important role as to whether resources were received in a timely manner (or at all) and if parents and carers were in a position to assist their children without the resources and assistance normally found in their classroom environment (Cain, Fanshawe, and Goodwin 2021; Lalvani 2015). In countries with a large geographic area such as Australia, internet access was not guaranteed, and in Pacific SIDS, the distribution of educational resources outside major centres was particularly difficult, especially if national disasters hampered access. In some contexts, learning stopped completely.

Cultural and societal attitudes to disability and inclusion were also significant factors in expectations for equitable access. A significant body of research exists detailing how disability is a stigma in some cultural contexts, and why children with disability may not be as visible in society or in schools (c.f., Dickinson 2018; Hwang and Charnley 2010). For example, having a family member with disability may be viewed negatively and as a source of shame, or considered the result of negative consequences of parents' past deeds (Dorji et al. 2021). Additionally, many collectivist cultures prefer to take care of members of their own families at home, rather than delegate this responsibility to the government (Andriana, Kiling, and Evans 2022). Gender disparity is more pronounced in some Pacific counties (Gunawardena 2022) and in some cultural groups in Australian and New Zealand. In these contexts, disability and female gender may be considered a 'double prejudice' (Bakhshi, Babulal, and Trani 2017) with some girls


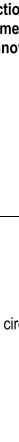
and women experiencing significant stigma and discrimination in society (Tavola and Whippy 2010). Participants' comments supported these observations. When there is a choice to send a child to school (or back to school after COVID-19), preference may be given to male children and those without disability.

The authors hoped that accessibility for students with disability would have been a priority when school closures and social distancing requirements came into effect. This perspective assumes that inclusivity is a common priority worldwide. Inclusive education is, however, primarily a western concept and priority (Mukhopadhyay 2015). Armstrong and colleagues (2023) highlight that concepts such as 'human rights' or indeed 'rights' may not have equivalent terms in some Pacific nations. As such, research must acknowledge the 'limitations of a 'human rights' conceptualisation of inclusion' (Armstrong, Johansson-Fua, and Armstrong 2023, 12) and consider cultural values and beliefs when analysing responses to emergency situations such as COVID-19.

Within the *microsystem*, parents and carers gained a new appreciation for their child's teachers, increased communication, and enriched relationships (Cain et. al. 2021; Cain and Fanshawe 2021; Naylor and Nyanjom 2021). In a student's *mesosystem*, access to an AST or support team was crucial for success in online learning. These teachers were responsible for ensuring that resources were accessible and for upskilling teachers in this area. A positive outcome of COVID-19 restrictions for ASTs was more time with their students in one-to-one settings. Time and depth of engagement was key as McLinden et al. suggest (2016; 2020). In the Pacific SIDS, ASTs created links between classroom teachers and students that previously did not exist, assisting generalist teacher to prepare learning packages. ASTs in all contexts gathered in communities of practice to solve problems, share ideas, and support each other.

The important *processes* identified were accessible resources and technologies. With the immediacy of school closures, diversity and access were not top priorities. Unless students had access to digital technology, reliable internet, and the knowledge and skills to access learning from day one, they were already behind their peers. Some students were indeed well versed in accessing learning online and did not feel impacted, whilst others (particularly in regional or remote areas) were waiting for hard copies of learning packages weeks after the lessons were given. Finally, and in hindsight, the *chronological* impacts of COVID-19 restrictions were unpacked. The need to have access, accessibility, planning, and relationships established and in place was the key take-away.

As a result of this study, we propose a series of key drivers or catalysts for how well a student fared (or not) during this period of disruption, uncertainty, and change. With consideration of the uncertainty, flux, and unexpected opportunities afforded by COVID-19 disruptions to learning, we have made pertinent connections between these drivers and the changing nature of bioecological systems in which students find themselves. Taking these key *drivers* for how well a student fared during COVID-19 restrictions, the authors offer a model over four response stages, for teachers, parents, and students to consider in preparation for the next time of disruption (Figure 2). With a focus on each of the bioecological systems, the drivers present a lens to focus on what educators can to *now* to prepare students for future events, immediately before, or *readying* for an event, as well as *during* and *after* events to successfully negotiate abrupt and unexpected change.

Driver	'Now'	'Readying'	'During'	'After'
Student Context [Macrosystem, Exosystem]	Complete a 'context analysis' for students, including home supports, learning preferences, tech availability and online learning skills. Establish logistics of disseminating hardware to different geographical locations.	Identify partnerships where remote learning will be especially challenging; establish learning communities for students to support each other; have technology ready to distribute to students' homes if needed.	Focus on student wellbeing; acknowledge emotions and feelings of isolation; prioritise additional support; conduct frequent student 'check-ins'.	Analysis and evaluation with key stakeholders 
Support from and for family and community [Microsystem]	Identify roles of families as remote learning communities; proactively build trusting and respectful relationships; establish mutually agreeable methods of communication.	Identify tech support systems (e.g., trouble shooting, helpdesk); build a FAQ bank, build skills in the use of assistive tech for parents and family members.	Acknowledge stress as part of remote learning; provide avenues for questions and feedback; facilitate frequent check-ins. Support families to enable some of the deliberate teaching of incidental learning.	
Support from and for specialist advisory teachers [Mesosystem]	Prepare specialists to provide accessibility support for generalist teachers and for counselling support they might provide families.	Confirm roles and responsibilities of specialists and classroom teachers, confirm methods and regularity of communication, establish communities of practice, and identify success criteria for effective remote learning.	Acknowledge how specialists are feeling; activate communities of practice and share innovative online intervention practices; identify advances made since the first instances of remote learning.	
Access to learning and accessible materials [Processes]	Specialists work with classroom teachers to build understanding of how materials are made assessable; establish a common understanding of Universal Design for Learning.	Confirm goals for successful remote learning. Review learning materials and collaboration tools for accessibility; relate accessible materials to general class context.	Review goals and success criteria for remote learning. Students and parents complete accessibility checklist and identify immediate needs.	Action improvements and share innovations 
Access to and familiarity with digital technologies [Processes]	Establish students' technology skills and knowledge of applications. Build students' 'learning to access' skills and tech confidence.	Identify tech support systems (e.g., trouble shooting, helpdesk); ensure all students have access to tech; prepare accessible learning packs where tech or internet is not available.	Activate student learning communities. Identify immediate tech needs and challenges; utilise data from helpdesk and other analytics.	
Preparations [Chronosystem]	Revisit key themes for remote learning: technologies and relationships; aim for 'access to learning' as an outcome.	Build attitudes of confidence and readiness; establish goals for remote learning and associated success criteria.	Recognise competing concerns and adapt accordingly.	

'Now': Actions to take now, when a disruption is theoretical;

'Readying': Actions to take when a disruption is likely or imminent;

'During': Actions to take whilst the disruption is occurring; and

'After'. Actions to take after the disruption. A critical stage of analysis and evaluation, and improvement and alterations. This then circles back into the first stage.

Figure 2. Drivers for successfully negotiating abrupt and unexpected change.

Using the microsystem as an example, the model identified that it is important to identify *now* the roles of families as future remote learning communities; proactively build trusting and respectful relationships and establishing mutually agreeable methods of communication. When *readying* for an imminent event, technology support systems should be identified (e.g. trouble shooting, helpdesk); a FAQ bank can be created and training provided in the use of assistive technology for parents and family members. *During* the event, stress should be acknowledged as part of remote learning, avenues provided for questions and feedback and frequent check-ins facilitated so families can be supported to enable the deliberate teaching of learning. *After* the event, these strategies should then be reflected upon to action improvements for the next event and share innovations that may be useful in future practice.

These drivers were presented as a keynote presentation at a national BLV conference and will continue to be put on the agenda for key policy makers to consider when planning curriculum.

Conclusions and implications for practice

As Cain and Fanshawe's (2021) research attests, students with BLV have additional social and emotional needs for inclusion in addition to physical and academic needs. Having BLV can be an isolating experience and a significant barrier to learning in itself (Wilkinson 2020). Adding complex socioeconomic barriers and compounding this with unexpected remote learning means individualised support should be a high priority. Our participants indicated that student independence, accessibility, and established relationships were key to success. While these results provide one perspective of the impacts to learning during COVID-19 times, these results should be considered in the context of the larger study, which considers the experiences of students, parents, and classroom teachers.

We have often heard COVID-19 referred to as a 'once in a lifetime' pandemic that has brought about a unique teaching and learning landscape. But the reality is that we will face ongoing disruptions to learning from a whole range of sources. With the possibility of further medical and/or natural disasters, educators should prepare for remote learning. As such, the aim of this research was not only to learn about the experiences of ASTs but to create something *practical* to support those involved in the education of students who have blindness or low vision through periods of disruption. Actioning the *Drivers* model presented here, will promote inclusive design in an intentional and proactive manner, thus providing students with BLV the skills to access learning on the same basis as their peers.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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