Lessons From the COVID-19 Unplanned Transition to Online Learning at Home for Students With Disability: Socialisation, Technology, Education and Future Research Opportunities

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Abstract

Purpose of Review Periods of transition for children and adolescents with disability are complex but usually anticipated. The COVID-19 pandemic resulted in an unexpected transition to online learning at home for students. This review examines the literature on the transition to online learning at home for students with disabilities in K–12 education during the COVID-19 pandemic and identifies the challenges and perceived benefits that emerged for these students to inform future planned or unplanned transitions to online learning.

Recent Findings Thirty-one articles met the inclusion criteria. Overall, the transition to online learning generated significant social and technical challenges for students with disability—ranging from inadequate socialisation and engagement issues to technological barriers. There were also notable benefits. For some students, this included fewer social pressures, improvements in mental health and the development of personal skills such as resilience. Parent and caregiver participation in the online learning tasks was crucial, often leading to deeper insights into the learning preferences and needs of students with disability and the ability to tailor and customise learning activities. The review identifies a need for inclusive research methods that actively involve students with disability in research on their online learning experiences. Furthermore, the predominant focus on boys with disability and the lack of representation of specific types of disability and support needs suggest that in future larger studies should strive for a more diverse and representative sample of the students with disability.

Summary Challenges and benefits reveal much about the disruptive impact the COVID-19 online learning transition exacted on some school-aged students with disability and their families. Greater attention to increasing access to technologies required for online learning is needed. The findings of this review can be applied in the adaptation of existing, or implementation of new learning modalities, accommodations and support for students with disability to promote their inclusion and access to education. Future research should explore a more inclusive approach and identify longer-term impacts of online learning on COVID-19 cohorts of students with disability and identify ways that schools can plan for more effective transition to online learning in the event of a future pandemic or other disaster requiring school closures.

Keywords K–12 education · Inclusion · Transition · Online learning · COVID-19 pandemic

Introduction

Social distancing requirements in association with the COVID-19 pandemic lockdowns in 2020 initiated the closure of school systems worldwide [1, 2], affecting 1.57 billion children and youth, 90% of the world's student population [2, 3] to the extent that more than 214 million children globally have missed more than three quarters of their in-person learning [4]. As a result, governments, school administrators, teachers and support staff alike were forced to deploy measures to transition learning for students through a range of online platforms and delivery modalities [5]. The impact of this abrupt transition on all children has been widely reported, both in terms of challenges (i.e., loss of and decline in learning, student dropout, increased social isolation and stress on family health and safety, especially for the most disadvantaged) [6] as well as benefits (i.e.,

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changes in understanding about the role of families in learning, innovative learning technologies, improved hygiene and health programs) [6].

For children and youth with disability, all transitions are inherently complex [7], involving both the process of change and the period of this change [8]. Such transitions, often occurring at established life stages such as entry to or leaving school or high school, require varied interventions and are extensively studied [8–11]. Amplified challenges faced by children with special educational needs during the transition from at-school to online learning at home initiated by the COVID-19 pandemic [12], notably in routine disruption and unequal resource and technology access which has affected their educational participation [13]. These challenges were exacerbated by the unpreparedness of educators for online pedagogy [14] and the absence of pre-pandemic adjustments and accommodations that had been provided in physical classrooms (e.g., support staff and services, and alternative modes of presenting information) [15, 16•], aggravating educational disparities for students with disabilities [14] and casting light on broader societal inequalities [8], particularly for women [17] and working families [18].

During COVID-19, students with disability faced additional challenges with the consistency and effectiveness of their therapeutic services, which were also disrupted by the shift to telepractice [19]. Problems with access to essential educational resources from schools, support workers and therapists were compounded by the difficulty many families faced supporting their children's education amidst other responsibilities related to the pandemic response, such as working from home and social isolation [16•]. The pandemic also intensified mental health issues among children with disabilities [19], particularly in the context of social isolation [12]. Indeed, the negative psychological and social impacts of online learning for students with disability necessitated enhanced support and resources [14, 20].

However, some autistic children's psychosocial outcomes improved from pre-pandemic to the initial lockdown, with reductions in hyperactivity, conduct problems, and peer relationship issues, alongside enhanced prosocial behaviours [21]. The pandemic environment (i.e., increased structure in daily life due to social distancing and elimination of organised activities) appeared to temporarily align better with the psychosocial needs of some autistic children [21], suggesting ways to improve the school experience for autistic children when on campus.

Building on existing scoping reviews that have examined the educational impacts on school-aged children with disabilities of the COVID-19 periods of lockdown and global school closures, this scoping review responds to the call for increased research relating to online learning and vulnerable populations, including students with disabilities, precipitated by the COVID-19 pandemic transitional period [22]. A diversity of terms has been used to describe this transition, such as virtual, remote and online learning. For clarity and to distinguish the pandemic-related transition under study, we use the term transition from at-school to online learning at home. Overall, the review seeks to shed light on the impact of the abrupt transition from at-school to online learning at home on the experiences of students with disability and to consider how the challenges and benefits of this unexpected transitional period can inform the design of future education modalities and help prepare students with disability for both planned and unplanned educational transitions.

Methodology

This review follows a configurative logic in investigating meanings and understandings of phenomena in a particular domain [23]. The purpose is to identify and map concepts and conceptual boundaries underpinning, and broadly document what is known about, a topic [24]. In it, the authors 'describe the nature of a research field' [25] and identify areas for further research [26], but do not fully report search strategies, or quality assessment criteria [27].

Our review process broadly followed Njelesani [28], who critically examine the participation of children with disabilities in qualitative health research. The second researcher independently conducted database searches of Academic Search Complete and Education Research Complete and Google Scholar, using the search terms adapted from Njelesani [28] with the addition of "COVID-19" OR "coronavirus" OR "pandemic" AND "transition".

We engaged in an iterative process moving from the search yields to our aims to refine our inclusion and exclusion criteria. Studies were included where they were: published between January 2020 and December 2023 (during and after the pandemic); written in English; refereed journal articles; inclusive of school-aged children and youth (5–18 years, K–12 or equivalent) with a disability and focused on the transition from at-school to online learning at home during the pandemic. Data were extracted by the second author and inserted into an Excel spreadsheet under the 12 categories represented in Table 1, analysed by the second author and reviewed by the first author.

Results

Study Selection Results

The iterative search procedure yielded 1157 potentially relevant articles, which were uploaded to Covidence, resulting in 712 once 445 duplicates were removed. Titles and abstracts were independently screened by the second author, who excluded 534 articles based on the agreed inclusion/exclusion criteria, resulting in 178 articles for full-text review by both authors. The full-text review process resulted in 31 articles from which data

Table 1 Characteristics of included studies (*N*=31)

Item	Description		No	%
Journal	Education/learning-focused		16	52%
	Disability/development		10	32%
	IT-related		3	10%
	Sociology		2	6%
Year of publication	Post-pandemic 2022–2023		17	55%
	First year of pandemic 2020		10	32%
	Second year of pandemic 2021		4	13%
Data collection period	First year of pandemic 2020		7	55%
	Second year of pandemic 2021		4	13%
	Post-pandemic 2022–2023		1	3%
	Not stated		9	29%
Study region (categorised within UN Geoscheme**)	Europe (UK=6, Turkey=4, Greece=1, Norway=1, Spain=1)		13	40%
	Americas (USA=10, Mexico=1)		11	35%
	Oceania (Australia=3)		3	10%
	Asia (Indonesia=1, Jordan=1)		2	6%
	Africa (Kenya=1, Zimbabwe=1)		2	6%
Education setting	Mainstream school		7	23%
	Special/inclusive education in mainstream school		6	19%
	Special/inclusive education and mainstream schools		4	13%
	Special/inclusive education school		3	10%
	Not stated		11	35%
School level	K–12		8	26%
	Secondary		7	23%
	Primary		4	13%
	Kindergarten		1	3%
	Not stated		11	35%
Study aim (focus)	Students' online home-learning experiences (challenges and benefits)		17	55%
	Education delivery modalities, supports, other service delivery		7	23%
	Impact of school closure and reopening		5	16%
	Student capabilities, skills and wellbeing		2	6%
Study methods	Qualitative: interview		14	45%
	Quantitative: survey/questionnaire/observation		10	32%
	Mixed methods		5	16%
	Participatory		2	6%
Participants	Parents/caregivers		14	45%
	Students and parents/caregivers		7	23%
	Parents/caregivers and teachers, support staff, service providers		4	13%
	Students with disabilities		3	10%
	Teachers, support staff, service providers		3	10%
Target population	Gender (total number across studies)	Boys	844	53%
		Girls	734	46%
		Non-binary	5	0.3%
		Not stated	8	0.5%
	Gender ratio within studies	Majority boys	16	52%
		Majority girls	6	19%
		Girls and boys 50:50	1	3%
		Not stated	8	26%
	Disability	Various disabilities*	19	61%
		Autism Spectrum Disorder (ASD)	8	26%
		Not stated	4	13%

Table 1 (continued)

Item	Description	No	%
Theoretical framework	Social theories [vulnerability/resilience]	9	29%
	Inclusivity/equity	9	29%
	Educational structure, technology	6	19%
	Cross-theoretical domains	2	6%
	Socioeconomic	1	3%
	Disaster management/recovery	1	3%
	Not stated	3	10%
Findings and conclusions	Both benefits and challenges in the transition to distance education	17	55%
	Challenges in the transition to distance education	12	39%
	Benefits in the transition to distance education	2	6%
Study limitations	Non-representative, small sample size and reach	13	42%
	Sampling, self-reporting or recall bias	8	26%
	Narrow focus, no baseline or comparative group	3	10%
	Part of a larger study with different aims	1	3%
	Not stated	6	19%

*Disabilities identified across studies: Angelman Syndrome, anxiety, apraxia, Asperger's, attention deficit disorder, attention deficit hyperactivity disorder, autism spectrum disorder, autoimmune conditions, blindness, cerebral palsy, deafness, Down Syndrome, depression, dissociative disorder, dyslexia, formal/official diagnosis of a special educational need or disability, hearing impairment, hypermobility, intellectual disability, Jourbet Syndrome, low self-esteem, multiple disabilities (alcoholic spectrum disorder, developmental dyscalculia, dyspraxia, Ehler Danlos Type 3, general learning difficulties, unidentified cognitive delays), oppositional defiant disorder, pervasive developmental disorder, physical and mental disabilities either congenital or acquired, Rett Syndrome, selective mutism, sensory processing disorder, specific learning disability, speech disorder (stuttering, dysarthria), speech and language disorder, unspecified behavioural disorder, unspecified language disorder, unspecified learning, emotional, and behavioural difficulties not necessarily categorized within a diagnosis, unspecified mental health disorder, unspecified processing disorder, Williams Syndrome

**We used regional classifications in the UN Geoscheme [29], which includes the UK in Europe

were extracted. The characteristics of all 31 studies are shown in Table 1. Note that the category 'target population' refers to the characteristics of students with disability involved in studies, where stated, both as active participants and as children or students of other participants (i.e., parents or teachers). We present the results for each of these two categories separately.

Discussion

Publication Sites

A majority of articles (*n*=16) were published in education journals, all of which were unique, while a third (*n*=10) were published in six unique disability/development journals and two in two unique sociological journals. Given the focus of this review on online learning, the lack of attention in educational journals represents a notable gap in the disciplinary knowledge base relating to students with disability.

Timing of Data Collection and Publication

There is a clear correlation between data collection periods and publication dates. Data for more than half the 31 studies (*n*=17)

were collected in 2020, during the first year of the pandemic, when many schools abruptly switched from at-school learning to online learning at home [30]. In a third of the articles (*n*=10), authors collected data and published in the same year and a third of articles (*n*=9) did not report data collection periods. This reflects the need at the time for rapid examination and dissemination of the impact of the pandemic on education in general and inclusive education in particular. Both data collection and publication rates dropped in 2021, at the height of the disruption to both education [16•] and research infrastructure [31, 32], which may have potentially limited access to research participants or perhaps indicate a wane in interest. Reflecting the time taken to publication, less than half the articles (*n*=17) were published in 2022–2023, when lockdowns ended around the world, allowing schools to reopen. Only one study [33•], both collected data and published during the period 2022–2023, which suggests either that interest in researching the impact of rapid transition to online learning on students with disability has already peaked, or that more studies are yet to be published.

Study Region

Seventy-five percent of studies were conducted in Europe (*n*=13) and the Americas (*n*=11), which suggests a more

responsive research infrastructure, or reduced restrictions in those locations. The remaining five studies were relatively evenly spread across Oceania, Asia and Africa, which suggests opportunities for future research in those regions. It is notable, however, that there are no studies emanating from China, where the COVID-19 virus originated [34].

Educational Setting and School Level

More than half the studies (*n*=17) were set in mainstream schools, with (*n*=6) and without (*n*=7) special/inclusive education units, or both mainstream and special schools (*n*=4). Only three studies were set in special schools, while 35% did not identify study location (*n*=11). Similarly, 35% of studies did not identify school level, almost a third were located in K–12 education broadly (*n*=8), secondary (*n*=7) and primary (*n*=4) schools and only one that included students with disability in kindergarten [35].

Methods

Almost half the studies used semi-structured or open-ended interviews (*n*=14), while ten employed surveys, five used mixed methods and two took participatory research approaches. The relatively even balance between quantitative and qualitative research designs is to be expected; however, the very small number of participatory approaches (*n*=2) suggests an opportunity for inclusive research methods, which focus on research with rather than on participants [36, 37], in which students with disability actively participate in studies concerning them, which is considered the fundamental right of citizenship [38].

Participants

Although most studies did not differentiate between carers and parents, this group participated in 77% of studies (*n*=24) and comprised the only participants in almost half the studies (*n*=14). Students with disability were the only participants in three studies: an observation and survey of 30 students in grades 1–8 [39]; a survey of 293 students in grades 6–9, of which 52 were students with disability [33•] and a study involving an interview and a self-reported determination inventory of 21 students in grades 6–12 [40]. Students with disability participated alongside their parents/caregivers in five survey studies [16•, 41•, 42•, 43, 44], one interview study [45] and one study in which a student with severe intellectual disabilities who could not read, write or use voice assisted technology was a co-researcher [46•], and four alongside parents/caregivers [47–50]. Three studies involved teachers, support staff and service providers alone [51•, 52, 53].

The predominance of parent/caregiver participation is to be expected, given their supportive role in their children's online learning experiences during the pandemic. However, we found a relatively small number of studies in which students with disability participated in research that specifically investigated their learning experiences, and an even smaller number where researchers used a participatory approach, albeit one study did not involve any students with disability [42•], while one positioned a student with disability as a co-researcher in the development of a novel remote communication method, 'doing and talking' [46•]. This finding suggests a lack of knowledge of the perspectives and experiences of students with disability, and an important space for future inclusive disability and educational research.

Target Population

While the gender ratio of the total student with disability target population shows balanced representation of boys (*n*=844, 53%) and girls (*n*=734, 46%), analysis of the gender ratio in studies where gender was identified (*n*=23) revealed that (a) boys comprised the majority of the target population/participants in the vast majority of studies (*n*=16), with three only involving boys [30, 41, 45]; and (b) girls comprise the majority of the target population/participants in only five studies, three of which used surveys [33•, 42•, 53], one involved interviews with eight girls and seven boys [54] and one video study involved one girl as a co-researcher [46•]. The dominance of reporting by parents/caregivers and students with disability themselves predominantly reflects third party views on boys' experiences of the transition from at-school to online learning at home during the pandemic, which suggests an opportunity for further research focused on girls and from the perspectives of the students involved.

Disabilities identified among the students with disability target population/participants are highly diverse including communication, physical, sensory, developmental, intellectual disabilities, mental health conditions and genetic disorders, and 26% of studies (*n*=8) focused entirely on autistic students. This suggests a need for further research with specific populations at focus so that their unique experiences and support needs are better understood.

Aims and Objectives of the Studies

The most common aim across the studies was examining the online learning experiences (i.e., both challenges and benefits) of students with disability(*n*=17). This was followed by the investigation of learning modalities, educational supports (i.e., assistive technologies) and school-based

transition to work services (*n*=7). Five studies aimed to compare the impact of school closure and reopening, and two explored the capability and skills development of students with disability as a result of the transition to online learning. These aims were reflected in the findings and conclusions.

Study Limitations

Most studies were small and locally focused, closely linking learning capacity and educational outcomes during the pandemic to local socio-economic factor. This limits the transferability of findings and conclusions. Specifically, the majority of the articles (81%) reported a small, non-representative size and reach (*n*=13), sampling, self-reporting or recall bias (*n*=8), or narrow focus, no baseline or comparative group (*n*=3) as the core study limitation, which meant that the outcomes were not generalisable even if yielding important lessons to be learned from examining study findings and conclusions.

Theoretical Lens

Social theories, such as those related to vulnerability, resilience and inclusion (*n*=9); and education theories, as related to school infrastructure, pedagogy and technology (*n*=9), equally framed 60% of studies. Socio-economic (*n*=1), disaster management/recovery (*n*=1) and cross-theoretical domains (*n*=1) framed three studies. This suggests a wide theoretical interest in the impacts of COVID-19 on social and educational outcomes of students with disability and their families.

Findings and Conclusions

There were three main domains reported in the results and conclusions of the included studies: socialisation and emotional well-being, technology use and educational outcomes.

Socialisation and Emotional Well-Being

During the transition from at-school to online learning at home inadequate socialisation was evident [35, 55], with a lack of access to recreation and social supports [41•]. Peer relationships declined [53], and it became apparent that some students with disability were uncertain as to how to negotiate friendships beyond school [45]. Yüksel [50] found students became introverted, and this negatively impacted language development. While Petlik [51•]noted the challenges remote learning presented in building relationships, there were exceptions, with Toste, et al. [40] finding students with disability remained socially engaged with friends through online clubs, activities and community programs; or texting and social media.

Reduced social expectations when learning online from home [42•] resulted in several positive benefits for students with disability. Benefits included fewer distractions and confrontations with peers in the classroom; and improved behaviour, mental health and interest in learning [48] and protection against bullying [54]. Students were reportedly happier, calmer and/or less stressed, anxious or agitated than they usually were at school [42•, 56•]. In contrast, the social-emotional well-being and mental state of some students with disability deteriorated with children becoming irritable [53] and feeling confused, scared or at times suicidal [41•]. Negative mental health outcomes were exacerbated by schools' depleted capacity to support students' mental health while simultaneously managing the pivot to online learning [45].

The development of personal skills was reported in the form of improved self-determination, self -management and self-regulation [42•]; awareness and acceptance of emotions and demonstrated self-belief to achieve goals [40]; improved coping mechanisms when facing challenging situations [56•]; increased self-awareness, independence and resilience [54, 57, 58]; and improved decision-making and self-management [59]. During the home-learning periods, strengthened relationships with family members were also reported [30].

Technology Use

Technology was found by Ashworth, et al. [41•] to exacerbate social problems, with technology that children without disability use to stay in touch with their friends not always being accessible to students with disability. Increased technology use during the pandemic also led some students with disability to dependence and addiction, self-isolation and increased stress [49, 50]. Conversely, Chinchay, et al. [49] reported technology use by students with disability as a means of alleviating boredom and negative emotions. The exclusion of students with disability from social online networking is also of concern during periods of enforced social distancing. Kversøy et al. [46•] reported that to be successful, remote communication depends on technology and knowing how to use it, 'but also on communication strategies that both work for the person with an ID (intellectual disability) and the majority (of people without disability) … success is just as much a question of the majority learning new skills and strategies that can make real inclusion and collaboration possible' [p. 319].

Aspects of online learning were difficult for students with disability to access [40]. The 'digital divide' was evident with some students not having sufficient access to a computer or the internet [39, 52]. Technical problems also hampered student

with disability engagement in online learning [49, 52]. Learning was negatively impacted when students lacked the necessary technological skills and were unable to negotiate online learning processes [50, 52, 53]. Students were often disengaged with their cameras switched off or not logging in at all [51•]. In some instances, schools did not utilise online accessibility features, such as closed captions [41•], or there was no provision of necessary disability-specific technologies [39].

Reasonable adjustments and additional support to facilitate the successful online learning of students with disability were evident in some studies [16•, 42•, 59]. Online learning was successful in supporting flexibility in time and space [30, 40], learning at one's own pace [52], learning tailored to individual students and opportunities for students to make decisions about breaks and times to 'decompress … … after school to be able to function' ([42•], p. 13).

Educational Outcomes

Student educational outcomes were heavily influenced by the availability of parents to assist their children [39], and this involvement, in some cases, resulted in a newfound understanding of their children's learning preferences and abilities [54]. Parents were observed to implement diverse and personalised or tailored activities that they perceived best met their child's individual needs and learning styles [48, 59], and in some studies, they gained more insight into their child's needs and ways to work on priority skills at home [44, 60].

Academic performance of students with disability was found to be negatively affected by the rapid transition from at-school to online learning at home [39, 61], often because of increased disengagement disengaged from school curriculum [45], with many students showing evidence of regression across seven instructional areas (i.e., literacy, science/social studies, mathematics, life skills, social skills, job skills and motor skills) [62].

Online learning at home during the pandemic may have also negatively impacted subsequent school attendance by students with disabilities, although only one study focused on the association of learning location with subsequent school absence. Kouroupa et al. [43] found that for students with neurodevelopmental conditions 'rates of school absence and persistent absence were significantly higher in the home learning group … suggest[ing] that school closure and home learning policies during public health emergencies may exacerbate school attendance problems in this group of vulnerable children' (p. 846).

Limitations

This review only considered research in recent years, when prior research on online or distance learning for students with disability might have provided further insights into the barriers to and facilitators for success that could be applied in future rapid transitions to online learning for this group (e.g., in further development of hybrid learning modes and any future pandemic circumstances arising). The outcomes of this review relied on the information reported in the articles which, in some cases, was not identified for characteristics such as data collection period, education setting and school level, students with disability, grade, age and disability type, theoretical framework, and study implications and limitations. A more detailed investigation is required to better understand the full impact of COVID-19 lockdowns and home learning on students with disability.

Conclusion

This review illuminates the multifaceted impact of the sudden transition from at-school to online learning at home during the COVID-19 pandemic on students with disability. The transition, necessitated by an unprecedented global crisis, brought to light both the challenges and advantages of online education for students with disability, highlighting crucial considerations for the future education of students with disability.

While the transition to online learning at home posed significant social and technical challenges for students with disability, which ranged from inadequate socialisation and engagement issues to technological barriers, there were also notable benefits related to the change in educational methods. These included, in studies focused on autistic students, some students reportedly experienced fewer social pressures, an improvement in mental health and the development of independence and coping skills. The participation of parents and caregivers in this, as supporters in the online learning modality, was crucial, often leading to deeper insights into student with disability's unique learning preferences and needs and enabling tailored or customised learning activities.

The review identified a need for inclusive research methods that actively involve students with disability in research concerning their online learning experiences during the COVID-19 pandemic, or in relation to future online learning situations. Furthermore, the gender imbalance in study participation (i.e., predominantly focusing on the experiences of boys with disability) and the lack of representation of certain disabilities in research (e.g., students with specific disability and support needs including cerebral palsy, intellectual disability, sensory disability) suggest that future studies should strive for a more representative sample of the diversity of the many populations of students with disability.

The abrupt transition to online learning, required without planning due to the COVID-19 pandemic restrictions on social movement and lockdown or home-schooling

requirements, has underscored the need for education systems to be adaptable while also striving to be inclusive. The insights gained from this period of unexpected and rapid transition to online learning at home should drive the design of future education modalities that accommodate the diverse needs of students with disability, ensuring equity and access to quality education for all learners during periods of both planned and unplanned transition to online learning.

Compliance with Ethical Standards

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Papers of particular interest, published recently, have been highlighted as:
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