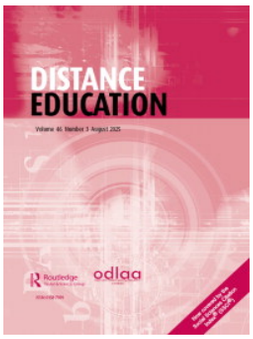

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# Experiences of disabled students in online education: a systematic review

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**ABSTRACT**

A mixed-methods systematic review of the academic and psychosocial experiences and requirements of disabled students in online higher education was conducted to understand what is known and identify potential areas for improvement. Five databases were searched for full-text, peer-reviewed journal articles published in English between 2017 and 2023, focusing on students enrolled in dedicated online education courses in higher education. Preliminary searches resulted in 1229 studies, of which 14 were extracted for thematic synthesis. Five themes were found: (1) The importance of staff-student relationships; (2) Flexibility makes it easier; (3) Challenges related to disability; (4) A need for adaptable support services; (5) Isolation and stigma in peer relationships. Findings showed that while the flexibility of studying online offers an additional access route into higher education for disabled students, gaps in academic support and adaptable accommodations add additional barriers, while fear of stigma from peers creates feelings of loneliness and exclusion.

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accessibility; disabled students; higher education; inclusion; online learning; students with disabilities

## Introduction

The inclusion of disabled students in higher education has taken rapid leaps over the last few decades (Madus, 2011). This has been further enhanced by the United Nations Convention on the Rights of Persons with Disabilities (United Nations, 2006) which states that disabled people have the right to accessible, inclusive education at all levels to support and enable them to reach their full potential (Article 24) and at the time of writing has been ratified by 192 countries and the European Union. Thus, these monumental strides in disability inclusion have had a significant impact on higher education, improving accessibility, supports, and facilities (Dukes et al., 2025; Heffernan, 2024; Leach, 2013).

The rise of online education over the last few decades has created an additional route into higher education for students (Castro & Tumibay, 2021; Kokhan et al., 2021;

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Pregowska et al., 2021). Literature shows that online education students are a distinct group separate from traditional higher education students, with the online education students being more likely to be mature-aged (Cupitt & Golshan, 2015; Kahu et al., 2014), with additional lifestyle commitments such as employment, family, and caring responsibilities (Brunton et al., 2018; Dyment et al., 2020; Farrell & Brunton, 2020). However, the majority of existing research and policies relating to disabled students are grounded in the experiences of traditional higher education students who attend college in person (Adefila et al., 2020; Barnes, 2007), leaving the online higher education cohort underrepresented. Thus, this systematic review aims to draw together the existing research on disabled students in online higher education (DSOs), exploring current knowledge and identifying literature gaps.

## *Defining online education*

Despite multiple attempts, a singular definition of learning and teaching using technology has yet to be accepted in the literature for widespread use. Table 1 below outlines some of the currently used terms and definitions. A persistent thread throughout all the definitions is that teaching and learning are delivered and received through a virtual medium, allowing learners and teachers to occupy separate physical spaces. Thus, this systematic review will use the term online education while encompassing all other terms within the literature search. The definition for online education used throughout this systematic review is: Teaching and learning delivered and received solely through an online environment, synchronously, asynchronously, or in combination.

## *Models of disability*

Within the literature, the term "disability" has begun to move away from its beginnings in deficit-based models and toward more socially aware and inclusive frameworks.

**Table 1.** Terms and definitions for learning through technology.

| Author | Term | Definition |
|---|---|---|
| Keegan (1980) | Distance Education | Programmes must constitute a course with learning materials that constitute the course of instruction and in which two-way communication with the institution is available |
| Berg and Simonson (2024) | Distance Learning | a form of education in which the main elements include the separation of teachers and students during instruction and the use of various technologies to facilitate communication |
| Manca and Delfino (2021) | Remote Learning | An emergency change to teaching online caused by the COVID-19 pandemic (noted as being significantly different to planned online education) |
| Banson (2022) | Online Learning | Education undertaken through the internet |
| Kuhlmann et al. (2024) | | A learning experience that is interacted with or mediated by the use of the internet |
| Singh and Thurman (2019) | Online Education | Education is delivered in an online environment through the use of the Internet for teaching and learning. This includes online learning on the part of the students that is not dependent on their physical or virtual co-location. The teaching content is delivered online, and the instructors develop teaching modules that enhance learning and interactivity in a synchronous or asynchronous environment |

Currently, diagnosis of disability is still made using the medical model, which positions the source of disability within the individual and indicates that a personal limitation or impairment caused the disability, which may need medical intervention (Guevara, 2021; Westley et al., 2020). In contrast, the social model of disability positions the source of disability as situated within society, where exclusions and functional barriers for individuals are created by society, or in the case of education, within institutions (Areheart, 2008; Barnes, 2019). Positioning the source of the disability as deficit-based has been found to increase stigma toward disabled persons (Peddigrew, 2023), as the focus is on what the person cannot do, which can negatively affect the person's self-view.

Disability advocates and researchers suggest the use of person-first (person with disability) or identity-first (disabled person) language, guided by the groups or person that is being spoken to or discussed (American Psychological Association, 2025; Andrews et al., 2022; Andrews & Forber-Pratt, 2022; Dunn & Andrews, 2015; Sharif et al., 2022). As the first author of this article is a disabled researcher with a background in online higher education, their preference for "identity-first" language will be used throughout this systematic review.

## *Literature review*

Online higher education has been posited as offering accessibility and inclusivity to disabled students (Kara et al., 2019; Kent, 2016), allowing flexible studying (Stone et al., 2019) and personalized time management (Kebritchi et al., 2017), enabling an ability to manage academic life around disability and personal needs (Richardson, 2009; Seale, 2014; Zeigler et al., 2017).

Maintaining a balance between lifestyle, academic demands, and disability needs is challenging for students (Reed & Kennett, 2017), resulting in decreased time and energy levels, and making it difficult for this cohort to establish peer relationships (McManus et al., 2017). Prior research shows that social isolation in a student population can affect wellbeing (Alsubaie et al., 2019), triggering or exacerbating depression and anxiety (Diehl et al., 2018) and raising the risk of student burnout (Stoliker & Lafreniere, 2015), indicating the critical need to develop peer relationships. The development of peer relationships are essential for disabled students to create a sense of belonging and inclusion (Taff & Clifton, 2022), to reduce non-completion (Wilcox et al., 2005), to support academic performance (Mishra, 2020), and to reduce feelings of exclusion (Kotera et al., 2019, 2021).

However, the ability of disabled students to develop a sense of belonging and create meaningful peer relationships is impacted by the need to divert time and energy to overcoming barriers to their learning experience (Rath, 2022). Barriers can include limited access to educational supports (Mullins & Preyde, 2013), inadequate access to accommodations (Roberts et al., 2011), and a lack of suitable accommodations (Toutain, 2019). Additionally, as higher education disability services were initially created for traditional on-campus students (Adefila et al., 2020; Barnes, 2007), there is frequently a misalignment with the specific needs of online education students.

### *Previous systematic reviews*

A prior systematic review by Reyes et al. (2022) considered the relationship between academic interventions and successful outcomes in DSOs. Their findings showed that accessibility is a crucial factor in achieving success for DSOs, along with academic support and socialization. Their findings highlighted gaps in the literature concerning inclusive pedagogical practices and psychological support. A second systematic review by She and Martin (2022) analyzed accessibility practices in online education. Their findings highlighted an urgent need for institutions to address accessibility issues for online education courses, including the need for academic staff to be better trained in accessible practices. Accessibility issues were also highlighted by Pittman and Heiselt (2014), who noted that DSOs faced difficulties accessing learning materials.

One method of promoting accessible education is utilizing the Universal Design for Learning framework (UDL: CAST, 2024). UDL aims to support learners and educators by providing flexible, accessible learning environments that remove barriers to education. However, research suggests there is minimal use of UDL in online learning spaces, creating imbalances in accessibility (Reyes et al., 2022; She & Martin, 2022; Yang et al., 2024).

### *Purpose of this study*

While there are previous systematic reviews on DSOs, they focused on their academic and educational experiences, including successful outcomes, academic support, accessibility, and the lack of UDL. It remains unclear within the literature how DSOs manage their academic and psychosocial experiences while managing the additional needs of a disability. Thus, to explore this and understand what is currently known to identify potential areas for improvement, we examined the following research questions:

- RQ1: What is currently known about the academic experiences of DSOs?
- RQ2: What is currently known about the effect of their disability on DSO's academic experiences?
- RQ3: What is currently known about the social relationships of DSOs?

## Methodology

We chose to do a systematic review as it aims to effectively retrieve and synthesize international evidence, minimizing bias and producing reliable results that can inform policy, practice, and further research (Munn et al., 2018). To address the research questions, we conducted a systematic review following the Preferred Reporting Items for Systematic Review guidelines (PRISMA: Page et al., 2021). In accordance with PRISMA, the protocol for this systematic review was preregistered on Open Science Framework (OSF.IO/BWU4D).

We set our timeframe to cover six years in online education disability research (2017–2023) as the field is rapidly evolving, and is affected by emerging technologies (e.g., AI, assistive technologies, interactive learning systems). In addition, a six-year time frame included 3 years pre- and post-pandemic, which would capture any changes in the experiences of DSOs in the post-pandemic era.

We chose established inclusion and exclusion criteria to guide the identification of relevant articles (Table 2). To ensure a comprehensive and methodological search, five databases were selected: ERIC, PsycINFO, Education Research Complete, Scopus, and Web of Science and searched using the search terms in Table 3. This grouping ensures that results will be inclusive of all disciplines and pedagogical theories and have a broad geographical scope. This combination aligns with methodological standards of recent systematic reviews (Bond, 2021; Moriña & Biagiotti, 2022). We followed this with a three-part secondary search, consisting of hand-searching relevant journals, a citation search of all papers included in the data extraction, and a search of prior publications by authors whose work was recurring at the data extraction stage (see Figure 1 for the PRISMA diagram with full details).

### *Screening*

Search results were imported into Covidence systematic review software for screening and review. Two reviewers independently reviewed the studies, with a requirement

**Table 2.** Inclusion/exclusion criteria.

| Inclusion criteria | Exclusion criteria |
|---|---|
| Published in English. | Grey literature. |
| Published between January 2017 and September 2023, restricted to this time period due to rapid technological advances and the evolution of online education as a widespread medium for teaching and learning | Secondary research (e.g., systematic reviews) |
| Full-text, peer-reviewed journal articles | Research on any other online student type (i.e., students taught on campus who pivoted to online learning during the COVID-19 pandemic) |
| Qualitative, quantitative, mixed, or multi-methods research | Research from any perspective other than students in online education |
| Online higher education matching the definition | |

**Table 3.** Terms used in database searches.

| |
|---|
| "online education" OR "online learning" OR "distance education" OR "distance learning" OR "online course*" OR "asynchronous learning" OR "synchronous learning" OR "asynchronous education" OR "synchronous education" OR "remote learning" OR "remote education" OR "virtual classroom" OR "non-traditional education" OR "open education" OR "open learning" OR telecourses |
| "emotional disorder*" OR "emotional disturbance* OR "behavioural disorder*" "behavioural disturbance*" or "behavioural problem*" OR "cognitive disorder*" OR "cognitive disabiliti* OR "Intellectual disabiliti*" OR "learning disorder*" OR "learning disabilit*" OR "mental health disabiliti*" OR "mental health disorder*" OR "physical disabilit*" OR "physical disorder*" OR "social disabilit*" OR "social disorder*" OR "neurodivergen*" OR disabilit* OR disabled OR "Chronic illness" OR "chronic disease" OR "long-term illness" OR "Anxiety" OR Autism OR "Autism Spectrum Disorder" OR ASD OR Autistic OR Dyslexia OR Dyspraxia OR ADHD OR "Attention Deficit Hyperactivity Disorder" OR ADD OR "Attention Deficit Disorder" OR Deaf OR hearing-impaired OR "hearing impaired" OR "visual disabiliti*" OR "visual Impairment*" OR "academic accommodations" OR inclusion OR "inclusive education" OR "special needs" OR "special education" OR "special needs education" OR "self-advocacy" |
| "academic degree*" OR "advanced degree*" OR "advanced education" OR "college education" OR "post-secondary education" OR "undergraduate education" OR "postgraduate education" OR "graduate education" OR "undergraduate study" OR "postgraduate study" OR "graduate study" OR "doctoral study" OR "undergraduate degree" OR "postgraduate degree" OR "graduate degree" OR "doctoral degree" OR "graduate training" OR "continuing education" OR "further education" OR "higher education" OR |
| college OR university OR "third level education" OR "tertiary education" |
| "adult student*" OR "adult learner*" OR "learner*" OR "college student*" OR "non-traditional student*" |

Searches 1–4 were then combined using "AND."

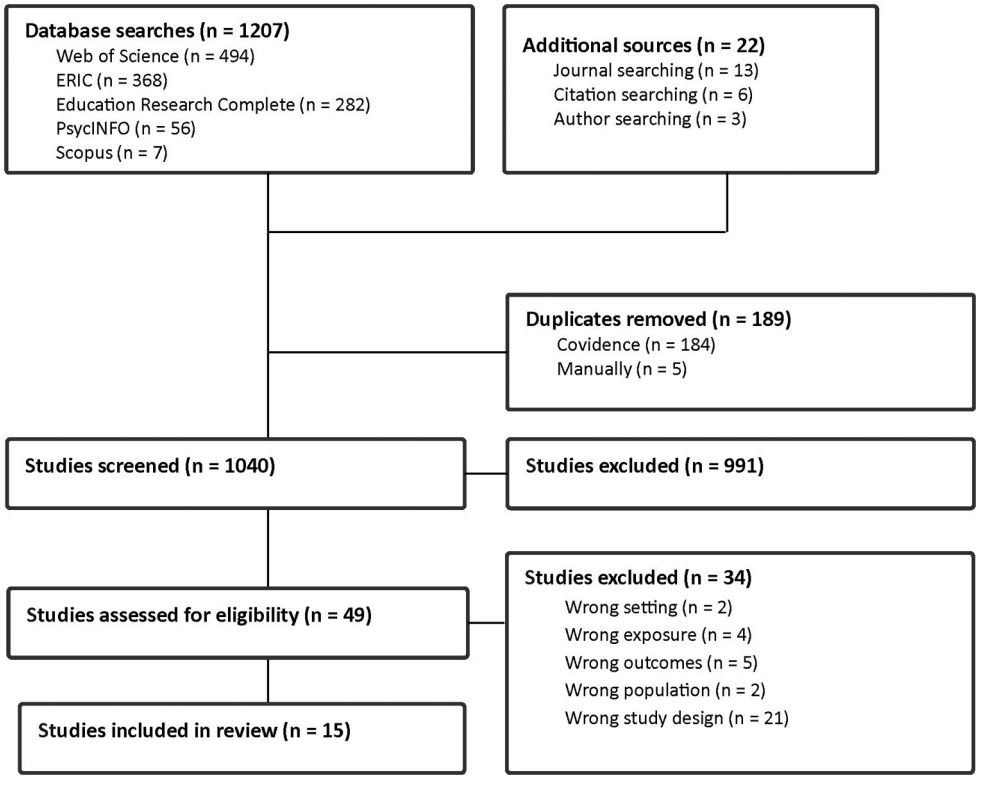


**Figure 1.** Prisma diagram of systematic review process.

**Table 4.** Inter-rater reliability.

| | R1 yes/R2 yes | R1 yes/R2 no | R1 no/R2 yes | R1 no/R2 no | Total | Cohen's Kappa |
|---|---|---|---|---|---|---|
| Abstract | 66 | 11 | 17 | 946 | 1040 | 0.8104 |
| Full text | 19 | 0 | 2 | 32 | 53 | 0.91982 |
| Total | | | | | | 0.86511 |

that both reviewers choose the same option (yes or no) to move the paper to the next stage. Disagreements between reviewers were resolved by a "tie-break" of a third party whose decision was final. Following the removal of 189 duplicates, two reviewers assessed 1040 titles and abstracts for relevance to the inclusion criteria, of which 53 were selected for full-text review. After removing studies that did not meet the inclusion criteria, 15 were accepted for quality appraisal.

Inter-rater reliability (IRR), which evaluates the degree of agreement among reviewers, was determined using Cohen's kappa ($\kappa$) (Cohen, 1960). Kappa ratings of .40-.60 are acceptable, ratings of .60-.80 are good, and values over .80 are excellent (McHugh, 2012; Sun, 2011). The IRR for this systematic review was provided by Covidience software for each of the screening stages. The full output can be seen in Table 4. The final agreement between reviewers in this study's screening process was $\kappa$ = .87, indicating excellent inter-rater reliability.

### *Quality appraisal*

The current study used Hong et al. (2018) Mixed Methods Appraisal Tool (MMAT) for quality appraisal, which is widely used in systematic reviews containing a mixture of qualitative, quantitative, and mixed methods studies (Clifford et al., 2018; Coyne et al., 2018; McGuinness & Guerin, 2024; Mikkelsen et al., 2019; Moore et al., 2019). The MMAT (Hong et al., 2018) recommends that the included studies are independently assessed by two reviewers across two stages. Firstly, the studies must meet screening criteria (are there clear research questions? Do the collected data address the research question?), if yes, studies should be assessed on areas of appropriateness of approach, data collection methods, sampling strategy, findings, interpretation of findings, and coherence between data, findings, and conclusions using a choice of "yes, no, or can't tell" responses (p. 287). According to the Hong et al. (2018) method, "using an overall numerical score is discouraged" (p. 287); however, to allow reviewers to reach a consensus, the technique used by McGuinness and Guerin (2024) to identify high, moderate, and low-quality studies was followed. This method categorized studies with a majority of yes votes as high quality, studies with a mixture of yes, can't tell, and no votes as moderate quality, and studies with a majority of no votes as low quality.

One study was excluded at the screening criteria stage as reviewers agreed the data did not answer the research question. Of the 14 remaining studies, the majority (n = 13) were of high quality; the final study was rated as low quality, with four votes of "no" and one vote of "yes." However, this study was retained for data analysis as reviewers agreed that the paper's findings added significant value, particularly since there are so few studies in this area to evaluate. Table 5 shows the ratings given to each study.

### *Data extraction, analysis, and synthesis*

The following were extracted from each paper: author, year of publication, country of publication, model of disability, study design, participant disability type, sample size, and results relevant to the research question (see Table 5).

To ensure a comprehensive search that gathered all available research in the systematic review, we did not narrow the screening to a particular methodological type; thus, the extracted papers combined qualitative (n = 9), quantitative (n = 3), and mixed methods (n = 2) research. As the aim of the study was to understand the experiences of DSOs, a qualitative analysis was most suited to this systematic review. To achieve this, quantitative data were transformed using the qualitizing process outlined in Onwuegbuzie and Leech (2021) as follows: The qualitative sections of mixed-methods papers were transferred to NVivo for analysis without alteration. Descriptive statistics were extracted from the results sections of the mixed-methods and quantitative papers and listed either as percentages or as means and standard deviations for each finding (depending on the presentation and availability of data in the results section), and then added to NVivo for analysis. This process enabled reviewers to draw qualitative meaning from the numerical data.

Data analysis and synthesis followed the three-stage integrative thematic synthesis approach developed by Thomas and Harden (2008). This method is recommended

**Table 5.** Information on extracted studies.

| Author | Year | Country | Design | Model of disability Used | Sample size | MMAT score | Disability type and number of participants | | | | | | | | | | | Key findings by theme | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | V | P | S | H | C | M | L | ND | Id | AB | N | 1 | 2 | 3 | 4 | 5 |
| Firat and Bildiren | 2025 | Turkey | Qualitative | M | 7 | 5 yes | 7 | | | | | | | | | | | | ✓ | | ✓ | ✓ |
| Kotera et al. | 2021 | UK | Qualitative | M | 9 | 5 yes | | | | | 11 | 2 | | 5 | | | | ✓ | | | | ✓ |
| Kotera et al. | 2019 | UK | Qualitative | M | 10 | 5 yes | 1 | | 1 | | 2 | 1 | | 7 | | | | ✓ | ✓ | ✓ | | ✓ |
| Lambert and Dryer | 2018 | Australia | Qualitative | M | 8 | 5 yes | | | | | | | 8 | | | | | | | ✓ | | ✓ |
| McManus et al. | 2017 | Australia | Qualitative | M | 12 | 5 yes | | | | | | 12 | | | | | | ✓ | ✓ | ✓ | | ✓ |
| Reyes et al. | 2023 | Spain | Qualitative | N/A | 24 | 5 yes | | 6 | 6 | | | 6 | 6 | | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Singh and MacDonald | 2022 | Canada | Qualitative | S | 6 | 5 yes | | | | | | 6 | | | | | | ✓ | ✓ | | | ✓ |
| Terras et al. | 2020 | USA | Qualitative | SR | 12 | 5 yes | 3 | | | | 2 | 3 | 3 | 3 | | | | ✓ | ✓ | ✓ | | |
| Warren and Schwitzer | 2017 | USA | Qualitative | M | 7 | 5 yes | | | | | | | | 7 | | | | ✓ | ✓ | ✓ | | ✓ |
| Genç and Koçdar | 2020 | Turkey | Mixed Methods | S | Qual:18 Quant: 703 | 5 yes | 320 | 295 | | 106 | | | | | | | | ✓ | | ✓ | ✓ | |
| Mallory et al. | 2023 | USA | Mixed Methods | N/A | Qual:9 Quant: 93 | 4 no, 1 yes | | | | 93 | | | | | | | | ✓ | | ✓ | ✓ | ✓ |
| Hernandez- Encuentra et al. | 2021 | Spain | Quantitative | M | 421 | 5 yes | | 155 | 63 | | 109 | 62 | | | | | | ✓ | | ✓ | ✓ | |
| Kent et al. | 2018 | Australia | Quantitative | S | 125 | 5 yes | 15 | 26 | | 7 | 36 | 49 | 30 | | 5 | | | ✓ | | | ✓ | |
| Yildiz et al. | 2022 | Turkey | Quantitative | SR | 809 | 4 yes, 1 can't tell | 403 | 227 | | 179 | | | | | | | | | | ✓ | | |

Note: The total number of students with disability may be larger than the total sample size due to participants recording multiple disabilities. Model of disability: M = medical, S = social, SR = self-reported, N/A = not available. Disability types: V = Visual; P = Physical/Orthopedic/Mobility; H = Hearing; C = Chronic Illness/Medical; M = Mental Health/Mental Illness; L = Learning Disability; ND = Neurodivergent; ID = Intellectual; AB = Acquired Brain Injury; N = Neurological. Themes: (1) The importance of staff-student relationships; (2) Flexibility makes it easier; (3) Challenges related to disability; (4) A need for adaptable support services; (5) Isolation and stigma in peer relationships.

for mixed-method systematic review synthesis (Hong et al., 2018; Phelps et al., 2020; Thomas & Harden, 2008). First, data were coded line by line to find relevance to the research questions. Next, codes were organized into descriptive themes and subthemes. Finally, the descriptive themes were examined in light of the research questions to create analytical themes that described the learning experiences, requirements, and barriers to the education of DSOs. This process was repeated across the data until a clear set of analytical themes was found.

## Results

Students who had a condition that affects physical functioning were the highest represented in the extracted studies, making up over 64% of participants. In contrast, students with non-visible disabilities had minimal representation. Notably, neurodivergent students and those with intellectual disabilities made up less than 1% of the participants.

Of the 14 included studies, seven used the deficit-based medical model of disability, three used the social model, and two allowed students to self-report if they felt they had a disability that affected their education. Geographic information showed that the majority of studies were conducted in Europe (n = 7), followed by Australia (n = 3) and the USA (n = 3) (see Table 5 for full information on extracted studies).

### *Results of the synthesis*

Thematic synthesis identified five themes: (1) The importance of staff-student relationships; (2) Flexibility makes it easier; (3) Challenges related to disability; (4) A need for adaptable support services; (5) Isolation and stigma in peer relationships. Figure 2 shows the development of the themes.

#### *RQ1: What is currently known about the academic experiences of DSOs?*

***Theme 1: the importance of staff-student relationships.*** This theme identified the central role of staff-student relationships in the experiences of DSOs. Positive connections with staff were associated with improved outcomes, while students faced barriers to information and fears of disclosure in the absence of a supportive staff presence.

An essential factor in online student experiences was the relationship with academic staff (Mallory et al., 2023). A positive staff-student relationship in online education was shown to have an impact on DSOs feelings of success (Terras et al., 2020), connection (Singh & MacDonald, 2022), confidence (Kotera et al., 2021), and motivation (Reyes et al., 2023). However, students also reported difficulties accessing information (Mallory et al., 2023), support (Hernandez-Encuentra & Gregori, 2021), accommodations (McManus et al., 2017; Reyes et al., 2023), and understanding assessment expectations (McManus et al., 2017). Additionally, many students were unaware of the availability of accommodations as DSOs (Hernandez-Encuentra & Gregori, 2021; Kent et al., 2018; Reyes et al., 2023).

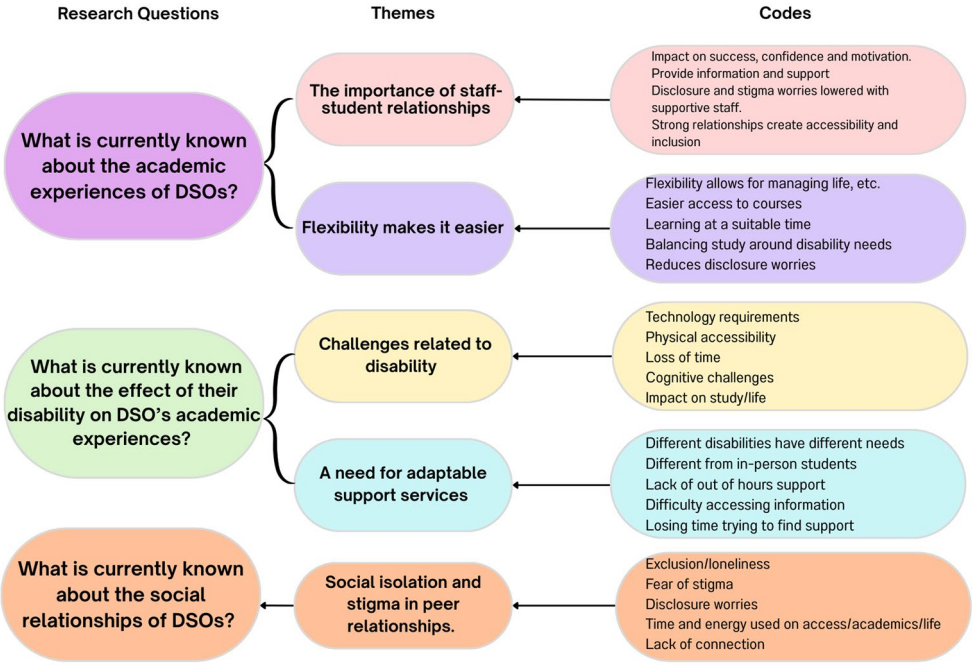


**Figure 2.** Thematic map.

Needing to disclose a disability to access support services was an area that created stress and worry. Students discussed feeling exposed (Reyes et al., 2023; Warren & Schwitzer, 2017) and had fears of being judged (McManus et al., 2017; Reyes et al., 2023; Singh & MacDonald, 2022; Warren & Schwitzer, 2017). Studies reported that to avoid these potential negative reactions regarding disclosure, some students chose not to report their disability and thus lost access to services and accommodations (Kent et al., 2018; Kotera et al., 2021; Reyes et al., 2023; Singh & MacDonald, 2022). The feeling of exposure was amplified when students needed to discuss their disability needs with multiple academic staff members in different courses to access accommodations for the same disability-related issue (McManus et al., 2017; Reyes et al., 2023; Terras et al., 2020).

Students believed that having access to an academic staff member who had knowledge of their disability and could provide support and information would remove some of the issues regarding disclosure and needing to ask for accommodations (Genç & Koçdar, 2020; Reyes et al., 2023; Warren & Schwitzer, 2017). Moreover, having a relationship with an academic staff member who instigated contact to ensure students received support and accommodations can create inclusion and accessibility (Singh & MacDonald, 2022) and reduce the need for self-advocacy in this cohort (Terras et al., 2020).

***Theme 2: flexibility makes it easier.*** Theme two highlights the central role of flexibility in creating accessibility for DSOs. Students consistently described being able to adapt study around their lifestyle and disability needs as an essential part of online education, and a route to higher education they would otherwise have been excluded from.

Students generally had positive thoughts regarding managing their learning and study around lifestyle and disability needs. The ability to arrange their time flexibly allowed them to manage life commitments and study time while being adaptable to changes caused by disability-related conditions (Kotera et al., 2019; Singh & MacDonald, 2022). Students noted that the ability to pause lectures, access class materials when it suited them, and take breaks, when necessary, made online education particularly accessible for disabled students (Terras et al., 2020; Warren & Schwitzer, 2017). Additionally, studying online allows students the privacy to manage pain, discomfort, or emotional difficulties in their own spaces (Reyes et al., 2023; Singh & MacDonald, 2022).

The flexibility of online education allowed students who had previously thought their disability barred them from accessing higher education to gain a degree, and in doing so, helped build their self-esteem and psychological wellbeing (Lambert & Dryer, 2018; Reyes et al., 2023).

### *RQ2: What is currently known about the effect of their disability on DSO's academic experiences?*

***Theme 3: challenges related to disability.*** This theme captures the challenges that a disability can create on a student's ability to engage with online learning. Elements like tiredness, cognitive difficulties, time management, and other disability specific conditions were noted in the literature.

Challenges to learning caused by disabilities created frustration, leading to additional stress and anxiety for students, reducing available time and energy for academic work (Lambert & Dryer, 2018).

Loss of time caused by disability-related challenges was a consistent theme among disabled students. For those with mental health conditions, deadlines had the potential to create additional stress, affecting their academic performance and ability to complete assignments (McManus et al., 2017). For deaf or hard-of-hearing students, trying to understand and express themselves in their second language added difficulty and needed additional time (Hernandez-Encuentra & Gregori, 2021; Mallory et al., 2023). Students with ADHD mentioned struggling to focus when working online, to avoid being distracted by other websites, and to manage their time (Mallory et al., 2023; Terras et al., 2020; Warren & Schwitzer, 2017). Students with physical disabilities may have periods of needing to rest, thus being unable to do any academic work, leading to a loss of time (Reyes et al., 2023).

Cognitive difficulties as either a characteristic of the disability or a side effect of medication were a frustration for many students, affecting their ability to focus and study. Feeling slower, having impaired memory, and low concentration levels were reported (Lambert & Dryer, 2018; Reyes et al., 2023; Warren & Schwitzer, 2017).

Negative self-talk was reported by many students as a side effect of their disabling condition, affecting their self-confidence and ability to manage new challenges. Students with mental health conditions discussed dealing with paralyzing anxiety and rumination, creating difficulties with self-motivation (Lambert & Dryer, 2018).

***Theme 4: a need for adaptable support services.*** In this theme, the importance of adaptable support services for DSOs is captured. While the extracted literature found

that accommodations were widely reported, many of the provided accommodations were unsuitable and did not meet the needs of the students.

Accessing accommodations and accessibility challenges were among the educational barriers most likely to cause DSOs to drop a class or miss an assessment (Hernandez-Encuentra & Gregori, 2021). The most commonly offered accommodation to DSOs was additional time to complete assessments (Hernandez-Encuentra & Gregori, 2021; Terras et al., 2020). However, extra time was insufficient when additional barriers were placed. For example, lecture recordings were made available without transcripts or subtitles, making them inaccessible to deaf or hard-of-hearing students (Genç & Koçdar, 2020; Mallory et al., 2023). Additionally, students reported that lecture screens sometimes had too much information for participants to comprehend while needing to be focused on subtitles, which meant re-watching recordings to gather all the information (Genç & Koçdar, 2020). Visually impaired students reported being asked to complete an assignment which included a driving task and for which accommodations were not offered (Terras et al., 2020). Moreover, students with visual impairments noted that not all areas of the learning materials were compatible with screen readers (Genç & Koçdar, 2020) or were not appropriately captioned (Mallory et al., 2023).

Cognitive difficulties, which can cause problems with memory and concentration, can be caused by disability characteristics, symptoms, or medication and can affect disabled students in multiple different ways.

A common finding in the literature was that students found accommodations were offered that were not adaptable to their needs, which created difficulties in meeting assessment criteria (Reyes et al., 2023). Additionally, students reported feeling like they weren't being believed when asking for accommodations or that they would be perceived negatively for needing them (McManus et al., 2017). Students must then either spend time arguing for different accommodation or accept one that is insufficient. However, while some disabled students were given accommodations based on specific characteristics (Reyes et al., 2023), others were penalized for them (Lambert & Dryer, 2018).

### *RQ3: What is currently known about the social relationships of DSOs?*

***Theme 5: social isolation and stigma in peer relationships.*** The final theme explores isolation in peer relationships. Isolation, feelings of exclusion, and worries about stigma were compounded by the limited opportunities for connection due to the asynchronous nature of online education.

Students discussed feeling socially isolated when studying online (Mallory et al., 2023), with feelings of separation creating emotional difficulties (Firat & Bildiren, 2025). Others reported feeling excluded and separated from their peers (Warren & Schwitzer, 2017).

Students consistently reported difficulties with interactions and building connections, with many finding it difficult to make contact with peers due to the asynchronous nature of online education (Kotera et al., 2019; McManus et al., 2017). Additionally, the fear of being stigmatized for having a disability created wariness in DSOs (Kotera et al., 2021; Warren & Schwitzer, 2017), with some reporting stereotyping (Singh & MacDonald, 2022), negative outcomes (Kotera et al., 2019) and outright discrimination

(Reyes et al., 2023). Thus, the ability to control the disclosure of disability status to peers to reduce stigma was considered a positive feature of studying online, allowing students to safeguard their privacy and keep their disability status private (Kotera et al., 2021). The extra time needed to manage academic life alongside a disability made it more difficult for students to socialize with friends and family (Lambert & Dryer, 2018), creating a situation in which DSOs experienced loneliness related to their disability (Kotera et al., 2019, 2021).

## Discussion

This systematic review used a mixed-methods approach to gather current literature on disabled students in online education (DSOs). We synthesized results from 14 studies that explored DSOs experiences and requirements to understand what is currently known and identify areas for improvement. Notably, 50% of the studies extracted for this systematic review used the medical model of disability, which positions disability as a deficit that must be fixed with medical intervention for them to succeed. The use of this model in education means that students must disclose medical information to access educational support.

The thematic synthesis uncovered five themes that, according to literature, were most important to DSOs, encompassing academic, psychological, and social dimensions. Positive staff–student relationships (Theme 1) and flexible learning structures (Theme 2) were found to be critical for student engagement, confidence, and well-being. In contrast, challenges related to disability (Theme 3) and the need for adaptable support services (Theme 4) highlighted the ongoing barriers for DSOs that can impede participation and exacerbate stress. Social isolation and stigma in peer relationships (Theme 5) indicate that DSOs emotional support needs must be considered.

A connecting thread through all the themes was that of time and energy. Flexibility allowed DSOs to structure their study in ways that suit their lifestyle and disability needs. Positive staff–student relationships reduced the time and effort required to access information and accommodations. Conversely, a lack of adaptability in support services forced students to invest significant time and energy negotiating suitable accommodations. Disability-related challenges further consumed time and energy resources, leaving less time for academic work, socialization, and engagement with peers.

Current literature shows that online education students have additional lifestyle commitments along with academic work (Dyment et al., 2020; Farrell & Brunton, 2020), meaning they are already time poor and disabled students have the additional responsibility of managing their disability needs (McManus et al., 2017; Reed & Kennett, 2017). The accumulation of demands on these students' time and energy, along with a lack of access to appropriate student supports, highlights the importance of creating improved policies that consider the needs of all students in higher education globally.

### *Connections to current literature*

The findings of this review align with and contribute to the broader body of research on disabled students engaged in online higher education. Consistent with prior studies,

the accessibility of online education was found to create an additional pathway into higher education for disabled students (Kara et al., 2019; Kent, 2016). In particular, the importance of positive relationships with academic staff members was found in the majority of the extracted studies, indicating a need for higher education institutions to implement policies that ensure this support is available. Additionally, our findings showed that access to a dedicated academic staff member reduced DSOs fear of stigma, difficulties with disclosing their disability, and problems accessing accommodations, areas that literature has found to be barriers to education (Eccles et al., 2018; Roberts et al., 2011; Shpigelman et al., 2022). Importantly, while prior studies generally viewed these factors in isolation, or in relation to a particular institution, this review offers an integrated perspective from DSO's worldwide.

For many DSOs, additional time was the predominant accommodation offered. Though this is a valuable accommodation for students whose disabilities impact time management (e.g., ADHD or chronic illness), offering extra time can increase the burden for online students with additional lifestyle responsibilities (Brunton et al., 2018; Dyment et al., 2020; Farrell & Brunton, 2020). Moreover, students were sometimes excluded from a fully inclusive experience due to poorly executed accommodations. These findings align with prior literature on higher education accessibility challenges (Reed & Kennett, 2017; Toutain, 2019) and suggest a need for targeted supports that reduce the time and energy students spend overcoming institutional barriers.

Reducing the time and energy spent navigating institutional barriers is particularly critical due to its impact on peer relationships (Rath, 2022). DSOs reported difficulties managing their academic workload alongside feelings of exclusion and loneliness, compounded by fear of judgment or stigma from peers. Supportive peer relationships are vital for wellbeing (Alsubaie et al., 2019), academic performance (Mishra, 2020), retention (Wilcox et al., 2005), and mitigating burnout (Diehl et al., 2018), highlighting the need to create inclusive online community spaces for DSOs.

The flexibility of online education enabled many students to access higher education who may have previously considered it unattainable. Building study schedules around lifestyle and disability needs provided space for academic development and personal growth. However, repeated disclosure requirements and inflexible policies continue to create barriers, reinforcing the critical importance of developing disability policies that are inclusive for students across higher education.

## Limitations

Although this study highlighted several important considerations for DSOs, it was limited in evaluating the requirements of students with non-visible disabilities, such as mental health, neurodivergence, and intellectual disabilities, due to the low numbers of these students included in the extracted studies. Additionally, due to the requirement that studies be published in English, participants in the included studies were located in Europe, Australia, or the United States, limiting the generalizability of findings to other geographical contexts. Inclusion of more diverse populations, including non-English speaking populations and various settings, is needed to strengthen external validity and ensure the broader applicability of recommendations.

## Conclusion and recommendations

This systematic review demonstrates that online education has the potential to be inclusive and accessible for disabled students. The flexibility, ease of access, and ability to structure academic life around lifestyle and disability have created a pathway to higher education for many students who were excluded from traditional education.

However, our findings highlight that DSOs worldwide are required to expend time and energy on overcoming barriers to access information, support, and accommodations, alongside managing their academic work, lifestyle requirements, and disability needs. This indicates that current higher education policies are insufficiently effective for some DSOs, and do not provide the level of support necessary to ensure this group can access education without overcoming multiple barriers, underlining the critical importance of refining higher education policies to consider the needs of DSOs in more depth. Therefore, policy amendments are recommended to create adaptable accommodations and accessible support services for DSOs.

Additionally, the findings highlight an urgent need to ensure peer support for disabled students within online higher education communities to combat the loneliness and isolation experienced by this cohort and provide a complete academic experience. Consideration of the creation of safe spaces where DSOs can manage the disclosure of disabilities while building peer relationships is recommended.

Adopting a critical perspective on disability and disabled students in online education that considers their individuality and abilities, rather than focusing on the *dis*ability and what they cannot do, is essential to promoting inclusive online higher education. In the online space, students can choose if they wish to disclose their disability. However, this is counteracted when they must repeatedly disclose their needs when asking for support.

In conclusion, to fully realize the accessibility and inclusiveness offered by the flexible approach of online education for disabled students, the current barriers must be removed through policy changes and further research. Adopting social or critical disability frameworks that challenge deficit-based approaches is essential to achieve fully inclusive online educational experiences for online higher education.

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## Data availability statement

Data analyzed in this study is available on request from the corresponding author.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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