ASSESSMENT & EVALUATION IN HIGHER EDUCATION
2023, VOL. 48, NO. 3, 390–402
https://doi.org/10.1080/02602938.2022.2077910

How are examinations inclusive for students with disabilities in higher education? A sociomaterial analysis

Joanna Tai[a], Paige Mahoney[a], Rola Ajjawi[a], Margaret Bearman[a], Joanne Dargusch[b], Mary Dracup[a] and Lois Harris[b]

[a]Centre for Research in Assessment and Digital Learning (CRADLE), Deakin University, Melbourne, Australia; [b]Centre for Research in Equity and Advancement of Teaching and Education (CREATE), Central Queensland University, Rockhampton, Australia

ABSTRACT

As a form of assessment, examinations are designed to determine whether students have met learning outcomes. However, students with disabilities report avoiding examinations, selecting units of study where the assessments align with their strengths. To ensure examinations do not contribute to the systematic exclusion of students with disabilities, it is important to explore their experiences. In this paper, we use a sociomaterial frame to analyse how examination arrangements construct inclusion in examinations. Interviews with 40 students were conducted across two universities. Inclusion or exclusion was variably constituted for students through emergent combinations of social and material arrangements. Covid-19 pandemic related social distancing related changes such as shifting examinations online, using technology, increasing time limits and moving to open-book examinations contributed to increased inclusion for most students, who were able to use familiar equipment in spaces they had adapted to their own needs. Staff acceptance and implementation of access requirements and assessment flexibility also contributed. While the attitudes and actions of staff involved in examinations can facilitate inclusion, reducing the need for adjustments through assessment design is important. This requires consideration of how time, technology, equipment and materials contribute to inclusion or exclusion, which may have benefits for many students.

KEYWORDS

Assessment design; inclusion; sociomaterial; students with disabilities; reasonable adjustments

Introduction

Examinations, like other assessments, are intentionally designed to determine who has met learning outcomes. However, they should not have the unintended effect of preventing diverse students from demonstrating their capabilities. Indeed, students with disabilities report selecting their units of study according to an assessment format that aligns with their strengths; many, as part of this, describe avoiding examinations (Waterfield and West 2006; Morris, Milton, and Goldstone 2019). This might mean that assessment types, such as examinations, influence the subjects that students take and ultimately impact the degrees they graduate with. As all students might consider the assessment types they will encounter when choosing which subjects to enrol in, to promote a just and diverse society, we must ensure assessments do not contribute to the systematic exclusion of students with particular conditions or characteristics (McArthur

CONTACT Joanna Tai joanna.tai@deakin.edu.au

2016). Since examinations are commonly harnessed for certification and accreditation purposes (Bearman et al. 2017), it is necessary to understand what can be done to improve the inclusivity of examinations. When using the term examinations, we refer to a range of high-stakes timed assessment tasks, which can include written papers – both multiple choice and longer essay formats – and other types of tasks where students are expected to perform or produce individual work within a limited timeframe. In this paper, we undertake a sociomaterial exploration of students with disabilities' examination experiences to consider the extent to which they were inclusive and what could be improved in practice.

Examination-related disadvantages have been mitigated through 'adjustments' or 'accommodations' for students with disabilities in accordance with legislative requirements (e.g. Disability Discrimination Act 1992). Adjustments for students with disabilities frequently include: changes to timing including extra time and breaks; changes in location such as a quieter, more physically accessible or individual room; and the provision of assistive measures such as a scribe or electronic devices (Hanafin et al. 2007; Madriaga et al. 2010). However, adjustments do not always lead to equitable academic outcomes (Brett 2016; Kilpatrick et al. 2017), nor address students' actual access requirements (Waterfield and West 2006). Moreover, making individual ad-hoc adjustments is time-consuming and inefficient. A system that focuses on making reactive adjustments is likely to become overwhelmed as participation of students with disabilities in higher education continues to increase (Waterfield and West 2006; Kilpatrick et al. 2017; Koshy 2019).

There are additional problems with a focus on adjustments beyond variability in experience. To gain access to adjustments, students must self-advocate and/or disclose personal information – something that not all students are prepared to do. Those not yet formally diagnosed may lack necessary documentation. Obtaining a diagnosis can also be time-consuming and costly (Lightner et al. 2012). While 5–6% of students disclose their disability, this is well below the estimated population prevalence of 20% (Grimes et al. 2019). Students may choose not to disclose their disability or request needed adjustments, since they perceive adjustments may give them an unfair advantage or signal their inability to meet expectations without assistance (Lightner et al. 2012; Grimes et al. 2017). Furthermore, common adjustments such as placing students into a separate room can cause students to feel excluded or different (Waterfield and West 2006; Hanafin et al. 2007). While these material aspects are important, what happens in interactions with people in preparation for an examination may also contribute significantly to students' experiences and outcomes. These considerations highlight the need to take a different perspective on supporting diverse students; rather than continuing to view disability as a problem to address at an individual level, the design of examinations might instead be problematised. We therefore retain the person-first language of 'students with disabilities' where necessary (e.g. in reference to literature), but largely just use 'students' to encourage the sector to problematise assessment rather than seeing challenges as residing within the student.

Some problems commonly experienced with examinations are already known, and these may be exacerbated for students with particular disabilities. For example, while additional time has been demonstrated to support students in situations where speed of task completion is an assessment feature, it can also be counter-productive for students who experience fatigue, and may not assist students with dyslexia whose outputs can be affected regardless of time allowed (Waterfield and West 2006; Lewandowski, Cohen, and Lovett 2013). Other groups may need even more time than allotted (Grimes et al. 2021). Examinations are by far the largest source of assessment design critique and anxiety for students who have failed academic subjects, which can lead to further failure (Ajjawi et al. 2020). Inclusion may also need to go beyond the mechanics of the task to consider assessment design in a broader sense: elements impacting the enactment of examinations include its objectives, materials, policies surrounding assessment and the stakeholders involved (Bearman et al. 2017).

However, the literature to date on designing inclusive examinations is sparse. Though there are several reviews of inclusive practices in higher education (Roberts, Satlykgylyjova, and Park

2015; Lawrie et al. 2017; Stentiford and Koutsouris 2021), only one has focused specifically on assessment (Tai, Ajjawi, and Umarova 2021). Whilst Tai, Ajjawi, and Umarova (2021) identified 13 papers which investigated students' experiences of particular assessment designs, these papers predominantly focused on a single characteristic (e.g. dyslexia) rather than considering student diversity more expansively, and little research considered examinations specifically. Since examinations in various formats are still a commonplace assessment type, it is important to understand how examinations might impact on inclusion for students who have a variety of disabilities, learning difficulties or other conditions which have traditionally led to eligibility for accommodations.

Considering examinations as sociomaterial arrangements

The literature outlined suggests that, for many students, the challenges with undertaking examinations are social and environmental – including assessment design. To investigate this complex intersection between students and their experience of examinations, we adopt a sociomaterial frame (Fenwick 2010). We conceptualise any examination as comprising relevant dynamic interactions between people, objects and spaces, including halls, laptops, students, administrators and educators. This perspective helps us to interpret how examination practices and experiences unfold through time and space. It provides insights into the social and material relationships that compose an examination, which by their very nature variably include and exclude actors (Bearman and Ajjawi 2021). For example, Bearman et al. (2021) take a sociomaterial perspective to describe how practical medical student examinations are designed by many actors but without any input from students or patients. Places and objects play an active part. As Fenwick and Edwards (2013, 53) write, 'Material things are performative and not inert; they are matter and they matter'. In another example, Mayes (2019) shows how, for a student who uses a wheelchair, disability and exclusion are constituted in school committees through the material arrangements of rooms, chairs, doors and stairs. Thus, spaces and objects can include, or exclude. This perspective is particularly pertinent in relation to the Covid-19 situation, which has increased the potential for inequity through the digital divide and varied home study circumstances, but also simultaneously presented opportunities for improved equity through the necessary but rapid shift online – for example, by creating less need to travel (Bartolic et al. 2021).

To highlight certain aspects of an experience, we draw on the term 'arrangements', from Schatzki (2002), to describe the local configurations of objects, spaces and people within which an examination activity takes place. By considering how patterns of these configurations lead to inclusion or exclusion of students, we can understand both what challenges exist and what benefits possible reconfigurations offer. Therefore, we explore students with disabilities' experiences of examinations to answer the following research question: How do sociomaterial arrangements shape the inclusivity of examinations?

Methods

Ethics approval for this study was granted by Research Ethics Committees at two Australian Universities (University 1 – approval 22567; University 2 – approval 2020-339).

Participants and data collection

Recruitment at the two Australian universities targeted students registered with their institution's disability support service. Students were contacted by email in October 2020 by their disability support service and invited to express interest in participating in an interview. We adopted maximum diversity sampling across reported characteristics to invite 20 students from each

institution to interview, to offer sufficiency in answering the research question whilst maintaining depth in the data (O'Reilly and Parker 2013).

Interviews were semi-structured, conducted remotely (via video conference or telephone), and recorded by members of the research team in November and December 2020, after two semesters' worth of learning and assessment disruptions in Australia where many universities 'pivoted' to online or remote assessments as a safety measure for social distancing and lockdowns. Interviews ranged from approximately 30 min to 1.5 hours. Students were asked about their experiences with examinations and/or timed assessments, their experiences of assessment more broadly, their adjustments, and their background, including any circumstances which may have impacted their university study and participation in assessment.

To give all students who had expressed interest an opportunity to share their examination experiences, students who were not selected for an interview were invited to submit a written or audio-recorded response to a list of prompts. The prompt questions addressed the same topics as the interview schedule. All student submissions were deidentified and assigned a pseudonym. Audio recordings were sent for transcription.

A total of 51 students participated, with 40 participating in interviews and 11 asynchronously submitting responses to the interview prompts. A range of age groups were represented, with 11 students aged 18–24, 15 students aged 25–34, and 16 students aged 35 or over. Nine students did not provide their age. Many disciplines were represented, including arts and humanities, law, information technology, science and engineering; however, there was a substantial proportion of health professions (e.g. nursing) and health sciences (e.g. biomedicine) students, who made up 49% of all participants. Students reported one or more conditions that required an access plan: 27 students (53%) reported one condition; 19 students (37%) reported two conditions; and 5 students (10%) reported three conditions. Thirty-four students (66%) also reported they were either rural, regional or remote, had a low socio-economic status background, were first in family to attend university, or had a combination of these characteristics.

Data analysis

Research team members initially inductively analysed two transcripts each using a sociomaterial sensitising lens. We attuned to how the social arrangements (e.g. asking for an extension) and material arrangements (e.g. space, time, objects such as a faulty computer) came together to include/exclude students (MacLeod and Ajjawi 2020). The team then met to discuss and develop an initial codebook based on our interpretations. Two members of the research team (MD and PM) then coded two further transcripts using NVivo software and met to discuss and refine the codebook. A third member of the research team (JT) then coded a further transcript to identify any further possible codes and to interrogate their relations. The three team members (MD, PM and JT) then met to discuss, merging duplicate themes and reorganising themes and subthemes to improve the codebook's utility. Coding of all interview data and student submissions was carried out by three members of the research team (MD, PM and JT). The research team met severally and iteratively as more transcripts were coded to develop our interpretations and meanings of the data. We present our findings with a general description of student experiences and then draw out common patterns or themes for the sociomaterial arrangements of examinations and what they constitute in terms of students' perceptions of inclusion/exclusion.

Findings

Students' individual experiences were quite varied. This was likely a result of the specific and situated sociomaterial arrangements in which each student was enmeshed, consisting of examination-related and personal circumstances. Complexity of personal circumstances included:

financial situation; work commitments; spaces/locations available for study; carer and family roles; distance study; regional location; and cultural differences or obligations. Students who had access plans with adjustments to examinations – which might include additional time, stretch breaks, separate rooms, an oral format, or assistance such as a scribe or technology – felt that, when implemented, their adjustments were usually helpful in allaying their stress around demonstrating their capabilities. The sociomaterial arrangements constituted very different experiences for students, with some commonalities to what students perceived as a positive and inclusive examination experience. While these arrangements were entangled, we now turn to unravel the layers of complexity and interplay through the following themes: social arrangements; technological arrangements; arrangement of examination spaces; examinations temporalities; and task layout and configuration.

Social arrangements

Student-staff interactions, particularly with unit chairs and other teaching staff, were not always easy; relationships needed to be established with individual teachers who each responded differently, which took time. Students' progress through units with different teaching staff also meant this was a recurring process that unfolded in unexpected ways. When academics were insensitive to student situations, this could create additional workload and stress for students to ensure their adjustments were upheld. For example, Courtney, a health professions student with a physical condition and learning disability, described feeling like 'an inconvenience' when her adjustments weren't automatically recognised. Many students reported these kinds of hiccups in the process when their requirements were not communicated effectively and efficiently. Missed connections could occur both when requesting adjustments in advance from unit chairs, and with invigilators in the case of in-person examinations. Such incidents could be distressing and significantly impact students, as Ellie, a health professions student with a medical condition and learning disability, highlighted:

> I shouldn't have to fight for something that should just be given to me, because I actually have had a disability for years now… I shouldn't have to, just because you can't physically see it doesn't mean it's not there… It is very frustrating emotionally more than anything.

However, positive relationships could be equally impactful. Yasmin, a science student with a mental health condition, identified her most academically successful units as those where her unit chair was empathetic and flexible, noting 'I think that made the most difference for me'. Students also described their interactions with accessibility staff as highly supportive. In contrast to the semester-long relationships with unit chairs, students were generally able to develop long-term relationships with their accessibility liaison team, since they had sustained contact with the same person or people over time. For students such as Ethan, a law student with complex intersecting mental and physical health conditions, an ongoing relationship with a familiar and supportive accessibility liaison officer was critical; as he explained, 'I was really good at masking my issues… [my accessibility liaison officer] can see through my facade a lot now'.

Technological arrangements

With the shift online as a result of Covid-19, technology constituted examinations in central ways. Many students found this more inclusive, especially being able to type answers rather than handwrite. For others, technologies such as access to computers had already been part of their examination landscape. An adjustment as simple as access to a computer made a significant difference for Samira, a health professions student with a mental health condition and learning

disability. Samira explained that she didn't think she could complete her degree if she weren't permitted to use a computer, noting 'handwriting and speed is not my friend… even though my knowledge base is good'. For other students with a physical condition making handwriting difficult, or those with a learning disability (particularly dyslexia), adjustments that allowed access to a scribe or assistive technology were often crucial. Vanessa, a health sciences student with a medical condition, found speech recognition software a big help: 'if you've got a lot of typing to do, in a situation that might normally take you a while, if your hands are a bit sore'.

However, technology was not always helpful. Students reported that poor internet connectivity was problematic when accessing online quizzes, tests and oral assessments. Rebecca, a law student with a medical condition and mental health condition, reported, 'one of my assessments [was] a mock court for evidence law. I just found that really difficult to do because this was all on Zoom. I was struggling to hear people and there was a lag'. Poor internet connections, especially in rural areas, meant students needed to prepare for possible disruptions in advance, including purchasing additional mobile internet devices as backup and having university helpdesk contact details to hand. When connectivity issues occurred, students faced the additional burden and stress of providing sufficient proof of their system access difficulties through screenshots and calls to IT support. Cameron, a student with a physical disability, also found a difference between his previous accommodations for in-person examinations – where he could use Microsoft Word, which includes grammar and spell-check – and online examinations – where the web page interface did not have this functionality. He resorted to copying and pasting between the two mediums, which he found 'frustrating and time-consuming'.

Arrangement of examination spaces

Physical arrangements contributed to inclusion in a number of ways. Students reported positive on-campus experiences when their place-related adjustments had been properly implemented – for example, when they were provided with a quiet room separate to the large examination hall. Shifting to remote/online examinations due to Covid-19 had substantial benefits for students with a range of conditions, including not having to travel long distances, being able to access the physical supports they needed, and taking breaks without fuss. Ben, a science student with a medical condition and learning disability, explained his home environment already had the equipment and software he needed for a positive examination experience. He noted, 'I don't need to worry about my exam accommodations being ignored or something like that, or the room changing. None of those problems occur'. Courtney, a health professions student with a medical condition and learning disability, noticed a shift in her mood when undertaking home examinations: 'I go in relaxed. If I get overwhelmed, I can take a deep breath, I'm at home and I can relax again and then go back to it'. Not having to travel to examinations was also seen by many students as a significant benefit of the Covid-19 environment. For Danielle, a health sciences student with a medical condition who lived in a regional area, 'having the exam online… meant I wasn't drained from driving to an exam location'.

Students also commented on how in-person examination spaces had an impact on their experience. Glen, a health sciences student with a medical condition and physical disability, pointed out he was able to monitor his progress against other students in an in-person context:

> One of the things that I really appreciate[d], in a way, was seeing when other people that were in my class stood up to leave because then I could get a sense, 'Well, I'm running behind or I'm okay'. I could see where I was, whether I was on track or not, and that was useful.

Several students also appreciated sitting their in-person examinations in a room separate from the main cohort but with other students who had similar requirements, as there were

fewer distractions but still a sense of inclusion. As Sofia, a health sciences student with a learning disability, noted:

> when I had to go to the physical place, I would see other people also getting extra time and stuff to go have breaks. It was really nice to feel normal, I guess, in that sense. I haven't really felt excluded.

In some instances, students' requirements for physical adjustments were overlooked and the error could not be rectified on the day of the examination. For students such as Glen, a health sciences student with a medical condition and physical disability, this meant having to undertake examinations in inappropriate conditions. Glen has an extreme heat intolerance, so he was meant to be provided with an electric fan under his accessibility plan. Although Glen submitted this information in advance, he found that 'at four different places, it never happened'. His accessibility plan also specified that he should have undertaken his examinations in a separate air-conditioned room, 'but no one knew what to do about it'. This particularly illustrates the tensions between the adjustments, the spaces and the people who implement adjustments.

Access to special equipment, such as a more comfortable chair or a standing desk, was also often an important adjustment for students – and not only for those with a physical condition. For Kellie, a health professions student with a mental health condition, having her noise-cancelling headphones and a small pillow with her was 'almost comforting. It's like a tool that sort of grounds me'.

Practical examinations or assessments were particularly mentioned by students studying health professions courses. Students with learning disabilities such as dyslexia found practical examinations helpful, as they enabled students to demonstrate their capabilities through a medium other than writing. Some students also preferred to be assessed in authentic situations such as clinical practice. The opportunity to demonstrate hands-on capability, with real-time feedback and chances to re-demonstrate capacity and refine practice, were seen as a positive in these settings. For some students, being assessed in a clinical situation was important even though these assessments could sometimes be more challenging. Eliza, a health professions student with a learning difficulty, acknowledged that online examinations at home could be easier to prepare for, but noted that:

> The career path that I'm following, you can't do it at home, you have to go into the clinic, you have to be scrutinised by the doctors checking your work. I feel it's something that you need to get used to doing.

Other students, however, still experienced stress in practical examinations or assessments. Tegan, a health professions student with a learning disability, explained that even though she had previously 'blitzed through' practical procedures in a non-assessment setting, when it came to the actual assessment 'I failed because I froze and didn't do the procedure correctly… as soon as they took the camera off of me I did it again and did it perfectly'. Unfortunately, in this instance Tegan was told she just needed to 'get over' her anxiety.

Examination temporalities

The time configuration of examinations impacted inclusion. Additional time was a common and much-appreciated adjustment for students. Cassie, a health professions student with medical and mental health conditions, reported that additional time gave her a chance to take a break and reset before returning to tricky questions, explaining: 'I would have really struggled had I not been given extra time'.

As a result of Covid-19, a large proportion of assessments shifted to more flexible timing arrangements, which many students found suited their conditions or commitments well, reducing their reliance on specific examination adjustments. Some timed online examinations could be commenced at any time within a 24 or 48-hour period, allowing students to start at a time that worked best for them, with maybe two or four hours to complete the task. This was beneficial to students with caring or work commitments they couldn't alter, as well as to students

with certain conditions. For Hannah, a law student with a mental health condition, a 48-hour window allowed her to follow her normal morning routines and 'start my exam when I [felt] ready'.

Other examinations involved a longer time period in which students could complete the task, such as 24 or 48 hours, allowing students to work throughout the day, taking breaks for meals, rest or a mental timeout as needed. This was beneficial for students such as Lisa, a business and commerce student with a medical condition that induced severe migraines. An examination open for a 24-hour period allowed Lisa flexibility: 'if I wake up with a migraine, I can drug up, download it, think about it, lay down for a bit, [chuckles] come back and do it'. However, some students felt that an extended examination period was more stressful, as the open timeframe made it difficult not to spend more time on the task than the guidelines specified. Charli, a science student with a mental health condition, explained that her 24-hour examination felt less like an examination and more like a 24-hour assignment. She noted, 'they said it should take two hours, but it really took much longer, and you just don't know when to stop. That I found wasn't really helpful'.

Task layout and configuration

The examination task design was also an impactful aspect of examination arrangements. Online open-book examinations increased concerns about cheating, and a common response was to alter question formats from multiple choice to longer answers. This led to diverse consequences for some students due to their condition or disability. Jacob, a health sciences student with a mental health condition, explained that multiple choice answers limited the chances of him introducing errors into his answers, which decreased his stress levels, whereas in longer answer formats 'you have no idea what you're doing when you're typing things in and you always feel a little bit scared'. For others, the open-book material format helped to reduce stress and fatigue associated with memorising information for closed-book examinations, and also emphasised the application of knowledge concepts rather than testing memory. Students spoke of reassuring strategies such as having textbooks to hand, collating extensive notes, and even preparing model answers they could draw upon. For Siobhan, a health professions student with a mental health condition, an open-book examination 'took away the mental stress that I've really felt in the past… of having to sit there and memorise things when I wasn't in the mental space'. Ellie, a health professions student with a medical condition and learning disability, found that case study type questions were easier to answer than others she had encountered, but also recognised that not everyone might perform well with this style of thinking and demonstrating capability. She observed: 'I think people need to be more careful with how exams are written because not everyone thinks in the same way'.

Students also spoke positively of examination designs which they could relate to their future practice. They relished the opportunity to focus on and demonstrate capabilities and knowledge that they saw as important for professional or disciplinary practice, promoting possibilities for inclusion beyond the university. However, students did not always feel examinations accurately reflected authentic practices. Rebecca, a law student with a medical condition and a mental health condition, noted that in some cases written assessments allowed her to demonstrate her capabilities realistically, but time-limited examinations did not reproduce the conditions she would encounter when practising law. She explained: 'with the exams I don't think I'll ever be in practice, and be told like, "You must write this memorandum of advice in two hours and you only have one book to do it, go"'. Students also reported being highly dissatisfied and demotivated when assessment was perceived as 'busy work' with little relevance to the discipline or students' goals. Ellie, a health professions student with a medical condition and learning disability, described her frustration with an examination that included logic and word puzzles rather than testing unit content, noting, 'I don't think that's a true measure of testing someone's intelligence in regard to content'.

Discussion

This study has demonstrated a number of ways in which sociomaterial arrangements impact on students' experiences of inclusion in examinations and other high-stakes timed assessments. Covid-19 related changes to examination spaces, temporalities and examination format were usually perceived positively as many allowances and adjustments were made more available, and students were able to configure their home examination environments without having to rely on others. Staff acceptance of students' access requirements and the implementation of any adjustments, including ensuring appropriate physical spaces, was important for inclusion. Further, students noted that some examination arrangements better aligned with the future ways they might be called upon to act beyond the university. They perceived that successful navigation of those examination arrangements would also have an impact on inclusion beyond their studies, as proof that they had capabilities applicable within work environments.

Whilst we artificially unravelled the layers of complexity in our narrative, we acknowledge that sociomaterial arrangements are not separable: they operate together, and can combine synergistically, or act in tension, resulting in a particular experience for a particular student. While material aspects such as timing, location, format and content of assessment impacted on inclusivity, staff attitudes and actions also contributed to – and either heightened or diminished – inclusive assessment practices through their impact on examination arrangements. Thus, while some material arrangements might ultimately have facilitated inclusivity, such as access to a computer to complete a task, the social arrangements determined possibilities for access to improved inclusion. These findings align with previous research which highlights that the social aspects of accessing adjustments – including social stigma (Lightner et al. 2012; Grimes et al. 2019) – are significant barriers to inclusive assessment in higher education.

Creating and maintaining genuine supportive relationships with staff was important to students in this study. This could be interpreted similarly to the concept of the educational alliance (Telio, Ajjawi, and Regehr 2015), which develops a supportive participatory relationship with mutual understandings of activities and goals, and has been demonstrated to be an effective environment for productive feedback. However, the educational alliance in the case of examinations extends to more than just an individual educator and the student. Through taking a sociomaterial framing, we identified that the facilitation of an inclusive alliance which supports students to participate in examinations involved spaces, technological arrangements and task design, in addition to students, academics, tutors, invigilators, facilities staff and external professional bodies. However, the resultant inclusion or exclusion effects from any set of examination arrangements were emergent; in addition to prospectively establishing inclusive alliances, we also need to consider what can be learned from previous arrangements.

One major finding in our study was that assessment flexibility enhances inclusivity. All assessment types may pose challenges for students with disabilities and students more broadly; however, examinations typically have standardised conditions around social and material aspects. Students reported the move to online examinations during the Covid-19 pandemic as improving inclusivity, primarily because of the increased flexibility offered around aspects including the examination's location, the assessment timeframe and the student's access to resources. While some students reported there were benefits to the routine of an in-person invigilated examination, the majority described their online examinations as being less stressful and better able to be tailored to their individual needs and capabilities, sometimes without the need for their usual accommodations. This artefact from the pandemic opens up discussion about how greater flexibility can be designed into examinations and other forms of higher education assessment to increase inclusivity and minimise the need for individual accommodations. However, greater flexibility often means decreased standardisation, requiring a move away from a belief that fairness in assessment is based on equality (i.e. everyone performing the same task under the same standardised conditions) to one where it is based on equity (i.e. differentiating according to student needs to support capability and diversity) (Tierney 2013; Harris and Dargusch 2020).

For greater flexibility in higher education assessment to become commonplace, this major philosophical shift needs to be embraced by all stakeholders, including those involved in accreditation and the future industries where graduates will work.

While a shift towards an equity perspective of fairness in assessment will take time, this research suggests some ways in which examination arrangements can be more immediately influenced to improve inclusivity for students. Although our findings are specific to students with disabilities (e.g. around how examination adjustments are implemented), the arrangements which fostered inclusion in this study might also foster inclusion more broadly amongst diverse students with multiple roles, personal characteristics and circumstances.

Firstly, academics, accessibility staff, administrators and invigilators are important actors within examination arrangements, in setting up the examination and ensuring it is conducted according to plan. Therefore, the people involved in examinations should act in ways to promote inclusion with an emphasis on equity. As students pointed out, this might be as simple as acknowledging and implementing an access plan or request for adjustments without judgement. Secondly, the design of the examination is more than just the content of the questions on the paper: it is also the time allocated per question, when students can access those questions, how we expect students to be 'present' for the examination (even if done at distance/online), what equipment, technology or materials are required/allowed, and how the examination links to learning outcomes and expected graduate practices. Students frequently reported they had previously required adjustments or accommodations for in-person examinations. Redesigning examinations to reduce the need for adjustments is an important consideration, and academics should think about how design may impact students with disabilities differently. Finally, considering the examination as a confluence of sociomaterial arrangements also brings in the dimension of time. Improving inclusivity is not a one-off action; rather, inclusion needs to continually be enacted to modify existing exclusionary attitudes, practices and arrangements. In some cases, this could mean removing examinations altogether, looking to more flexible alternative assessment which can minimise requirements for individual adjustments.

Limitations

This study has several limitations. Firstly, we asked students themselves about their previous experiences which were impactful, which may have led to the reporting of more positive and negative stories, rather than their more neutral experiences. We also cannot make assumptions about what *all* students need, despite the number and breadth of experiences we were able to collect. Secondly, we asked students about their examination experiences in late 2020, when there had been rapid shifts in the ways assessment was configured due to the Covid-19 pandemic. Students may have focused more on the shifts in arrangements that facilitated their participation in examinations during lockdown and social distancing requirements. Therefore, the full extent of the impact of prior sociomaterial arrangements on students' examination experiences may have been minimised and under-reported by students. We also focused this work on examinations: additional or different issues may arise in other forms of assessment.

In this paper we explored the experience of students who had previously had an access plan and examination accommodations, and who were already in contact with their accessibility service. Examination design may also impact a broader range of diverse students: in addition to students with disabilities, in recent years students from a range of equity groups are increasingly participating in university study, including those from regional, rural and remote and/or low socioeconomic status locations (Koshy 2019). Equity group students continue to face challenges due to inflexible assessment design (Naylor and Mifsud 2019). There may also be students who have similar experiences to equity group students, but do not necessarily align with a declared categorisation – for instance, students who are the first in their family to attend university (O'Shea 2016). Therefore, further research is required to understand the examination experiences of students who may belong to more than one equity group category, and how

membership of multiple groups (i.e. intersectionality) may compound or amplify inequity (Crenshaw 1991). As we learn more about the diversity of experiences, we will gain a better understanding of what aspects of examinations are definitely not inclusive, and what might be more inclusive across student equity groups.

Conclusion

This study identified the often-hidden layers of complexity that constitute students' experiences of examinations, drawing on sociomaterial framing to explore what might improve inclusion within higher education assessment. The social and material arrangements relating to examinations combined to create variable levels of inclusion and exclusion, often in ways that affected students physically and mentally. There are some aspects of what happens within the sphere of the university which could be targeted to improve inclusion, such as improving responsiveness and processes for adjustments, and reconsidering assessment design to identify alternatives to examinations. These changes may impact many more students than just those who have declared a disability. However, suggested improvements should not be one-off endeavours; rather, practices need to be initiated and then continued and reviewed, to improve inclusion in higher education.

Acknowledgements

'Re-imagining exams: How do assessment adjustments impact on inclusion?', was conducted under the National Centre for Student Equity in Higher Education (NCSEHE) Research Grants Program, funded by the Australian Government Department of Education, Skills and Employment. We thank the students who participated in the project for their contributions to this work.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

This research was conducted under the National Centre for Student Equity in Higher Education (NCSEHE) Research Grants Program, funded by the Australian Government Department of Education, Skills and Employment.

ORCID

Joanna Tai http://orcid.org/0000-0002-8984-2671
Paige Mahoney http://orcid.org/0000-0003-4719-6015
Rola Ajjawi http://orcid.org/0000-0003-0651-3870
Margaret Bearman http://orcid.org/0000-0002-6862-9871
Joanne Dargusch http://orcid.org/0000-0003-4208-9843
Mary Dracup http://orcid.org/0000-0002-5678-4145
Lois Harris http://orcid.org/0000-0002-7379-3676

References

Ajjawi, R., M. Dracup, N. Zacharias, S. Bennett, and D. Boud. 2020. "Persisting Students' Explanations of and Emotional Responses to Academic Failure." *Higher Education Research & Development* 39 (2): 185–199. doi:10.1080/07294360.2019.1664999.

Bartolic, S. K., D. Boud, J. Agapito, D. Verpoorten, S. Williams, L. Lutze-Mann, U. Matzat, et al. 2021. "A Multi-Institutional Assessment of Changes in Higher Education Teaching and Learning in the Face of COVID-19." *Educational Review* 1–17. doi:10.1080/00131911.2021.1955830.

Bearman, M., and R. Ajjawi. 2021. "Can a Rubric Do More than Be Transparent? Invitation as a New Metaphor for Assessment Criteria." *Studies in Higher Education* 46 (2): 359–368. doi:10.1080/03075079.2019.1637842.

Bearman, M., R. Ajjawi, S. Bennett, and D. Boud. 2021. "The Hidden Labours of Designing the Objective Structured Clinical Examination: A Practice Theory Study." *Advances in Health Sciences Education* 26 (2): 637–651. doi:10.1007/s10459-020-10015-w.

Bearman, M., P. Dawson, S. Bennett, M. Hall, E. Molloy, D. Boud, and G. Joughin. 2017. "How University Teachers Design Assessments: A Cross-Disciplinary Study." *Higher Education* 74 (1): 49–64. doi:10.1007/s10734-016-0027-7.

Brett, M. 2016. "Disability and Australian Higher Education: Policy Drivers for Increasing Participation." In *Student Equity in Australian Higher Education*, 87–108. Singapore: Springer Singapore. doi:10.1007/978-981-10-0315-8_6.

Crenshaw, K. 1991. "Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color." *Stanford Law Review* 43 (6): 1241–1300. doi:10.2307/1229039.

Disability Discrimination Act. 1992. Commonwealth of Australia. https://www.legislation.gov.au/Details/C2018C00125.

Fenwick, T. 2010. "Re-Thinking the 'Thing." *Journal of Workplace Learning* 22 (1/2): 104–116. doi:10.1108/13665621011012898.

Fenwick, T., and R. Edwards. 2013. "Performative Ontologies: Sociomaterial Approaches to Researching Adult Education and Lifelong Learning." *European Journal for Research on the Education and Learning of Adults* 4 (1): 49–63. doi:10.3384/rela.2000-7426.rela0104.

Grimes, S., J. Scevak, E. Southgate, and R. Buchanan. 2017. "Non-Disclosing Students with Disabilities or Learning Challenges: Characteristics and Size of a Hidden Population." *The Australian Educational Researcher* 44 (4–5): 425–441. doi:10.1007/s13384-017-0242-y.

Grimes, S., E. Southgate, J. Scevak, and R. Buchanan. 2019. "University Student Perspectives on Institutional Non-Disclosure of Disability and Learning Challenges: Reasons for Staying Invisible." *International Journal of Inclusive Education* 23 (6): 639–655. doi:10.1080/13603116.2018.1442507.

Grimes, S., E. Southgate, J. Scevak, and R. Buchanan. 2021. "Learning Impacts Reported by Students Living with Learning Challenges/Disability." *Studies in Higher Education* 46 (6): 1146–1158. doi:10.1080/03075079.2019.1661986.

Hanafin, J., M. Shevlin, M. Kenny, and E. M. Neela. 2007. "Including Young People with Disabilities: Assessment Challenges in Higher Education." *Higher Education* 54 (3): 435–448. doi:10.1007/s10734-006-9005-9.

Harris, L. R., and J. Dargusch. 2020. "Catering for Diversity in the Digital Age: Reconsidering Equity in Assessment Practices." In *Re-Imagining University Assessment in a Digital World*, edited by M. Bearman, P. Dawson, R. Ajjawi, J. Tai, and D. J. Boud, 95–110. Cham: Springer. doi:10.1007/978-3-030-41956-1_8.

Kilpatrick, S., S. Johns, R. Barnes, S. Fischer, D. McLennan, and K. Magnussen. 2017. "Exploring the Retention and Success of Students with Disability in Australian Higher Education." *International Journal of Inclusive Education* 21 (7): 747–762. doi:10.1080/13603116.2016.1251980.

Koshy, P. 2019. "Equity Student Participation in Australian Higher Education: 2013 – 2018." Perth: Curtin University. https://www.ncsehe.edu.au/wp-content/uploads/2020/04/NCSEHE-Equity-Student-Briefing-Note_2013-18_Accessible_Final_V2.pdf.

Lawrie, G., E. Marquis, E. Fuller, T. Newman, M. Qiu, M. Nomikoudis, F. Roelofs, and L. van Dam. 2017. "Moving towards Inclusive Learning and Teaching: A Synthesis of Recent Literature." *Teaching and Learning Inquiry* 5 (1): 9–21. doi:10.20343/teachlearninqu.5.1.3.

Lewandowski, L., J. Cohen, and B. J. Lovett. 2013. "Effects of Extended Time Allotments on Reading Comprehension Performance of College Students with and without Learning Disabilities." *Journal of Psychoeducational Assessment* 31 (3): 326–336. doi:10.1177/0734282912462693.

Lightner, K. L., D. Kipps-Vaughan, T. Schulte, and A. D. Trice. 2012. "Reasons University Students with a Learning Disability Wait to Seek Disability Services." *Journal of Postsecondary Education and Disability* 25 (2): 145–159.

MacLeod, A., and R. Ajjawi. 2020. "Thinking Sociomaterially: Why Matter Matters in Medical Education." *Academic Medicine* 95 (6): 851–855. doi:10.1097/ACM.0000000000003143.

Madriaga, M., K. Hanson, C. Heaton, H. Kay, S. Newitt, and A. Walker. 2010. "Confronting Similar Challenges? Disabled and Non-Disabled Students' Learning and Assessment Experiences." *Studies in Higher Education* 35 (6): 647–658. doi:10.1080/03075070903222633.

Mayes, E. 2019. "Reconceptualizing the Presence of Students on School Governance Councils: The a/Effects of Spatial Positioning." *Policy Futures in Education* 17 (4): 503–519. doi:10.1177/1478210317739468.
McArthur, J. 2016. "Assessment for Social Justice: The Role of Assessment in Achieving Social Justice." *Assessment & Evaluation in Higher Education* 41 (7): 967–981. doi:10.1080/02602938.2015.1053429.
Morris, C., E. Milton, and R. Goldstone. 2019. "Case Study: Suggesting Choice: Inclusive Assessment Processes." *Higher Education Pedagogies* 4 (1): 435–447. doi:10.1080/23752696.2019.1669479.
Naylor, R., and N. Mifsud. 2019. "Structural Inequality in Higher Education: Creating Institutional Cultures That Enable All Students." Perth. https://www.ncsehe.edu.au/wp-content/uploads/2019/09/NaylorMifsud-FINAL.pdf.
O'Reilly, M., and N. Parker. 2013. "'Unsatisfactory Saturation': A Critical Exploration of the Notion of Saturated Sample Sizes in Qualitative Research." *Qualitative Research* 13 (2): 190–197. doi:10.1177/1468794112446106.
O'Shea, S. 2016. "First-in-Family Learners and Higher Education: Negotiating the 'Silences ' of University Transition and Participation." *HERDSA Review of Higher Education* 3: 5–23.
Roberts, K. D., M. Satlykgylyjova, and H.-J. Park. 2015. "Universal Design of Instruction in Postsecondary Education: A Literature Review of Empirically Based Articles." In *Universal Design in Higher Education: From Principles to Practice*, edited by S. Burgstahler, 65–80. Cambridge, MA: Harvard Education Press.
Schatzki, T. R. 2002. *The Site of the Social: A Philosophical Account of the Constitution of Social Life and Change*. University Park: Penn University State Press.
Stentiford, L., and G. Koutsouris. 2021. "What Are Inclusive Pedagogies in Higher Education? A Systematic Scoping Review." *Studies in Higher Education* 46 (11): 2245–2261. doi:10.1080/03075079.2020.1716322.
Tai, J., R. Ajjawi, and A. Umarova. 2021. "How Do Students Experience Inclusive Assessment? A Critical Review of Contemporary Literature." *International Journal of Inclusive Education* 1–18. doi:10.1080/13603116.2021.2011441.
Telio, S., R. Ajjawi, and G. Regehr. 2015. "The 'Educational Alliance' as a Framework for Reconceptualizing Feedback in Medical Education." *Academic Medicine* 90 (5): 609–614. doi:10.1097/ACM.0000000000000560.
Tierney, R. D. 2013. "Fairness in Classroom Assessment." In *SAGE Handbook of Research on Classroom Assessment*, edited by J. H. McMillan. Thousand Oaks, CA: Sage Publications.
Waterfield, J., and B. West. 2006. "Inclusive Assessment in Higher Education: A Resource for Change." Plymouth doi:10.4324/9781315045009.