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RESEARCH PAPER

"Obstacles to my learning": A mature-aged student with autism describes his experience in a fully online course

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In 2006 the Vice Chancellors' Committee approved national guidelines relating to students with disabilities in Australian universities, prescribing that all students should have an equal opportunity to participate fully in university life. Responding to these guidelines requires a sound understanding of the student experience in both on-campus and online learning environments and a commitment to inclusive course design. This paper reports on the experiences of a mature-age student with autism enrolled in a fully online teacher-education course. Whilst contemporary pedagogical approaches to online learning may be welcomed by many, for this student it created significant obstacles in his learning path and threatened his ability to continue. The student's articulation of his experience provides a window into a world that is foreign to many, and offers course designers and teaching staff insights into designing for inclusivity.

Keywords: autism, online learning, non-traditional students, higher education, applied learning, learning design

Introduction and overview

In 2011 a new teacher-education course was launched in a mid-sized university in Australia. The undergraduate course is aimed at teachers employed within vocational education and training (VET) sector and is offered in a fully online mode of study. Critical to the course design was a desire to embed an applied learning approach that would engage students and also model a pedagogical approach suitable for the students' own teaching environments (Downing & Herrington, 2013a). A set of six design principles was developed by the teaching staff as the course moved through the university approval process and these principles have continued to guide the development, delivery and evaluation since commencement.

This paper reports on the experience of a particular student in the course, who came to the attention of teaching staff and fellow students when he publicly declared his struggle to understand and engage in the online environment. The challenges Steven (pseudonym) described were in stark contrast to the intentions of the design principles and the reported experience of the majority of students. A follow-up posting by Steven in the unit's online Discussion Board revealed that he was autistic and believed this to be the reason for his struggle. Mindful of the obligation to provide an environment where all students can participate fully and completely, a study was initiated to explore how the online course design hindered Steven's full participation both academically and socially. The study also sought to identify strategies to improve his experience at university. There is broad acknowledgement that more research is needed to investigate the impact of autism on

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participation in higher education (Elzouki, Guest, & Adams, 2012) because of the increasing number of affected students. In the United Kingdom, for example, there has been a 408% increase in students with autism entering university between 2003 and 2008 (Munro, 2011).

Steven, along with the majority of his peers in the course, is considered to be a 'non-traditional' student. This has become a somewhat of a catch-all term, as it may include any or a combination of the following characteristics: mature aged, employed either part or full time, with family commitments, living in a remote or regional area, belonging to a minority group, with a disability, first in family to attend university, low socio-economic status, or having left compulsory schooling relatively early (Gilardi & Guglielmetti, 2011; Laing & Robinson, 2003; Munro, 2011; Roberts, 2011; Taylor & House, 2010). Significantly perhaps, Steven holds all these characteristics, so is likely to align with the learning approaches associated with this cohort. A review of the literature suggests that non-traditional students tend to prefer a practical, rather than overly theoretical approach (Laing & Robinson, 2003; Pundak, 2010; Roberts, 2011) and place a high value on positive relationships with teaching staff and student peers (Malcolm & Zukas, 2000). Non-traditional students may have lower levels of self-efficacy (Bamber & Tett, 2000; Munro, 2011) which is associated with an increased likelihood of failure or withdrawal from studies, particularly in online learning environments (Yukselturk & Bulut, 2007).

In 2006, the Australian Vice Chancellors' Committee endorsed revised guidelines relating to students with a disability, prescribing that 'universities provide students with a disability the opportunity to realise their academic and social potential and to participate fully in university life' (Australian Vice Chancellors' Committee, 2006, p. 3). The Act has broad and significant implications, not only in terms of the physical layout of campuses but also in relation to the design of courses, including those offered in a fully online study mode. There has been a significant growth in online offerings in higher education in the last two decades. The 'anytime, anywhere' mantra from potential and current students and the rapid advancement in information communication technology has sparked an unprecedented rate of change in this sector and course designers and teaching staff need to consider how students with disabilities will function and interact and what barriers might prevent full participation.

Autism is a condition that may affect students' capacity to participate, both academically and socially. Most commonly, autism is referred to as a disability with a 'triad of impairments'- in communication, imagination and social interaction (Wing & Gould, 1979). In addition, students may experience sensory processing differences and extreme levels of anxiety (MacLeod, 2010). It is considered a spectrum condition which varies in the degree of severity and the extent to which it affects the individual's ability to live a happy and satisfying life (Moore, 2012). Within a higher education setting the condition may impact the student in multiple ways and to different extents, particularly in relation to the aspects of social interaction and communication. This is particularly significant when planning for online courses, where strategies for communication with and between students can be more challenging (Salmon, 2011).

Like many courses within his university, Steven's course is offered in a fully online mode of study. The adoption of online teaching and learning in the higher education sector has been widespread and is now found across a range of disciplines (e.g., business, education, health, psychology, accounting, information technology) and program levels (e.g., from associate diplomas to doctorate degrees). Online courses provide a borderless market for universities and colleges without adding pressure to on-campus infrastructure. Between 2009

and 2014 the online education industry in Australia has experienced an annual growth of 14.4% with estimated revenue of over $6 billion dollars (IBS World, 2014). In the US, approximately 33% of all higher education students enrolled in higher education in 2007 were undertaking at least some of their study online (Allen & Seaman, 2008) and in the UK, a recent review of the current provision of online education providers reveals that 77% of universities are strategically planning for increased online education.

The growth of online higher education has occurred simultaneously with a widening of student diversity. Globally, participation rates in higher education have rocketed as governments pursue the societal benefits of a greater percentage of the population holding bachelor level qualifications. In Australia, for example, the Bradley Report (2008) recommended that the federal government actively pursue a goal of 40% of the 25-34 year old population with a bachelor degree by 2025. Five years after the recommendation was adopted success looks imminent, with recent figures revealing a rise from 25% to nearly 37% of the target population now holding this qualification (Australian Bureau of Statistics, 2013). In the United States, enrolment in degree-granting institutions increased by 11% between 1990 and 2000 and by an even more impressive 37% between 2000 and 2010, with the biggest contributor to this rise being students over the age of 25 (NCES, 2012). More broadly, the most recent OECD report on education (OECD, 2013, p. 291) found that between 1995 and 2011 entry rates into tertiary programs had increased by more than 20% across member countries, largely due to a greater range of courses and improved accessibility.

Applied learning design

As teaching staff began designing the online course, discussions with potential students confirmed the need for the course to 'walk the talk' of applied learning. Applied learning is most closely aligned with experiential learning (Dewey, 1938; Kolb, 1984) and emphasises connections between what is being learnt and the 'real world' of work, focussing on the knowledge and skills that will be required in the discipline. Importantly, applied learning focuses on the student rather than the curriculum and encourages the development of a sense of independence and responsibility for learning and performance. Course designers sought to create a course that modelled what the students would then integrate into their own teaching practices in their VET settings. The challenge was exacerbated by the fully online delivery, prompting the development of guiding principles. The major theoretical influences informing the design principles are authentic learning (Herrington, Reeves, & Oliver, 2010), applied learning (Ash & Clayton, 2009), situated learning (Brown, Collins, & Duguid, 1989), Realistic Teacher Education (Korthagen, 2001) and reflective practice (Brookfield, 1995; Schön, 1983). The aim of the applied learning design principles is to ensure that students are active participants in the learning process, interacting and collaborating in learning strategies that are similar to what will be expected in their workplace. Assessment tasks focus on responding to typical challenges and problems that are found in the workplace, and recognise that solutions may be multi-dimensional and complex. In line with the applied nature of the course, students are expected to integrate theory with practice, and create products that will be useful in their own right, particularly for those who are in-service teachers.

In Table 1, each applied learning design principle is listed together with its enactment within the eLearning environment, and the relevant theory from which each principle is drawn.

Table 1: Enactment of design principles and associated theory

Principle	Students will:	Associated theory
1. Provide learning activities that connect theory and application in authentic contexts.	• Draw upon their own, authentic, contexts as they are exposed to and consider theoretical concepts within education. • Engage in critical reflection on past events, engagement with current situations and imagining future events within their own contexts. • Be involved in tasks that will mirror or draw upon the actual working environment, ensuring that the cognitive demands are similar to what will be/is expected in the workplace.	Experiential Learning Theory (Dewey, 1938) Authentic Learning (Herrington et al., 2010) Reflective practice (Brookfield, 1995; Schön, 1983) Situated learning (Brown, Collins, & Duguid, 1989) Realistic Teacher Education (Korthagen, 2001)
2. Recognise and incorporate the lived experience of students	• Be encouraged to draw upon their experiences, perspectives and roles and invited to identify differing point of views that may exist. • Participate in practicums and reflect on those experiences with peers and teaching staff in online blogs, discussions and wikis.	Adult learning theory (Knowles et al., 2011) Authentic Learning (Herrington et al., 2010) Professional and teacher education (Rogers, 1969; Shulman, 1998)
3. Provide meaningful opportunities for collaborative construction of knowledge within the learning community	• Work together collaboratively in each unit within the course. • Be encouraged to take on leadership roles within the student community in areas where they feel comfortable and competent.	Authentic Learning (Herrington et al., 2010) Situated learning (Brown et al., 1989) Communities of Practice (Lave & Wenger, 1991)
4. Encourage the development of a reflective, professional identity through collegial interactions in a variety of settings	• Be involved in authentic tasks that enable them to reflect meaningfully. • Be encouraged to identify and reflect on their existing beliefs that may have formed over many years. • Be actively involved in both identifying and articulating their tacit knowledge. • Have a growing appreciation of the complexity of the workplace.	Authentic Learning (Herrington et al., 2010) Realistic Teacher Education (Korthagen, 2001) Professional and teacher education (Rogers, 1969; Shulman, 1998) Reflective practice (Brookfield, 1995; Schön, 1983)
5. Provide flexible assessment tasks that reflect the requirements of authentic work settings.	• Experience assessment tasks that draw upon the required skills and knowledge in their future workplaces, and include practical products. • Collaborate with others as part of the assessment preparation process. • Often complete a variety of tasks within the one assessment item.	Authentic Learning (Herrington et al., 2010) Situated learning (Brown et al., 1989) Realistic Teacher Education (Korthagen, 2001)
6. Encourage an increasing level of student ownership of learning.	• Be encouraged to see the point of what they are learning and be free to adopt their own conceptions. • Be invited to take on a supportive role themselves, particularly with their less experienced peers. • Be encouraged to be increasingly responsibility for their learning.	Communities of Practice (Lave & Wenger, 1991) Reflective practice (Brookfield, 1995; Schön, 1983) Authentic learning (Herrington et al., 2010)

The course is underpinned by the *Desire2Learn* Learning Management System (LMS) which serves as the 'home-base', with a variety of strategies and resources such as recorded presentations, guiding notes for students, scholarly readings, podcasted interviews with subject experts, and learning tasks to complete. Students and teaching staff communicate via emails and the discussion board in the LMS, and participate in web-conferences regularly. The students collaborate in practical activities using Web 2.0 tools such as wikis, blogs and ePortfolios.

Research design

The research design is situated within the qualitative interpretivist paradigm. This approach aims to better understand the 'world of human experience' (Cohen & Manion, 1994, p. 36), proposing that reality is constructed by social interaction and individuals' perceptions of it. Interpretivist researchers seek to uncover and better understand the perspectives of the participants and tend to favour methods of data collection that include interaction and dialogue. It is recognised, therefore, that the experiences of both the participant and the researcher influenced the methods of data collection and subsequent analysis in this study. It is an appropriate research paradigm for this study as Steven, an adult student with autism, offered to contribute to the research process.

An instrumental case study was adopted as a strategy of inquiry (Stake, 1995). The aim was to study a particular case, Steven, in order to gain a greater understanding of specific issues he faced when studying online (Stake, 1995). Learning more about Steven would inform the broader evaluation of the effectiveness of the design principles. Qualitative data were collected from a number of sources. These included artefacts retrieved from the eLearning environment, such as Steven's discussion board postings, written contributions to group activities and assessment task submissions. An electronic log of Steven's activity within the unit was also retrieved to detail his time and types of activity within the Learning Management System. A preliminary analysis was conducted to identify the areas where Steven's activity or outcomes were significantly different to his peers. This analysis revealed that Steven was accessing the LMS more frequently than the vast majority of students, and often accessing resources multiple times. Steven's activity was then sorted into broad categories using cluster analysis (Miles & Huberman, 1994), order to inform the next stage in the data collection. The categories were: contributions to collaborative tasks, approaches to assessment tasks, discussion board postings, and accessing content items (such as recorded lectures).

From the preliminary analysis, a list of interview questions was developed to guide a semi-structured interview (O'Leary, 2004). On Steven's request these were emailed to him two days before the interview, to allow him time to reflect on the questions and consider his responses. The questions sought to facilitate a greater understanding of Steven himself; his lived experience as a student and his beliefs about how he engages and learns in educational settings. Following the interview, Steven was given the interview transcription and invited to make corrections, clarifications or additional comments. Over a number of weeks, further email communication with Steven focussed on particular aspects of his experience and explored these in greater depth. Both the participant and the researcher were actively involved in the data collection, with both individuals noting that it felt like a journey towards greater understanding.

The data analysis process adhered to the three steps advocated by Lindlof (1995) in phenomenological research, in order to reach an understanding of the Steven's experience. Firstly, the researcher considered her own preconceptions in relation to the design principles and the intended experience for students in the course, including Steven. This was done in order to be aware of the subjectiveness of the data coding that would follow, and recognise the potential for biases or prejudices. The data were then analysed and inductively coded according to perceived relevance to the research questions, using the NVivo software (Version 10) application. In total, over ten thousand words were collected in the research process. The final analysis considered all data once more, in order to ensure that all aspects of Steven's experience had been examined in a comprehensive and complete manner.

Findings

The findings are presented in the order that they were uncovered, focussing on the aspects that helped the researcher to understand how the design of the online course design hindered Steven's full participation both academically and socially. The discussion that follows identifies strategies that may improve his experience at university.

Steven's first assessment submission revealed confusion with what was required. This task required students to reflect on various activities earlier in the semester, and draw together their initial thoughts in relation to their developing philosophy of learning and teaching. It was, purposefully, a rather undefined task; being the first step towards a more developed philosophy statement that would form the second assessment task. While most students seemed to enjoy both the range of activities and reflecting on what they had learnt, Steven's submission was largely a collation of the reasons why he could not do the assessment task as required. He noted in his submission:

> *'I absolutely cannot cope with vague concepts or blurry guidelines. This is a limiting factor to my learning ability which many other learners do not share as they often relish the freedom.'*

Steven's submission prompted the Unit Coordinator to make contact and discuss a way forward. A check of Steven's time spent in the online learning environment confirmed that he had accessed all resources and spent significant time engaging with the course content and student discussion board. As a result, an alternative assessment strategy was negotiated, adopting a more traditional format of an analysis and comparison of major learning theories. This submission was of an excellent standard, which assured both Steven and the Course Coordinator that the desired learning outcomes were in reach. Notably, this was all done before Steven announced in the discussion board that he was autistic. Rather, the alternative assessment task aligned with the principles underlying the course; in particular, of increasing student ownership of the learning process.

Despite the steps taken after the first assessment submission, Steven revealed his continuing struggle with the unit two weeks later when he posted the following reflection in the discussion board:

> *'Life lately seems to be overflowing with learning and different learning environments… I feel that the online environment throws up many obstacles to my learning which may ultimately prove overwhelming. On-campus I am shown what is to be learned and I am able to set about learning it. The paths are clear, efficient and not hidden behind e-portfolios, Wikis and blogs. When I click on*

> *my [online] units I am confronted by all three. I must first climb these mountains in order to get to the actual subject matter.'*

His posting triggered a vibrant and engaging discussion between Steven, his peers and the unit coordinator. The discussion was even more poignant because the unit itself was focussed on theories of learning and teaching so the relevance and value was obvious to all. In a subsequent posting, Steven revealed he was autistic and unsure whether it was the online mode of delivery or the pedagogical approach that was making the learning environment so challenging for him. This posting provided the catalyst for a deeper study of Steven's experience, which he agreed to participate in.

The interview with Steven first explored his background and personal life. Steven is 33 years old, and comes from a family of timber-workers and farmers. He is married, with three children and lives in a regional area. He is the first in his family to attend university. Employed as a teacher aide in a TAFE college, he supports students who are new arrivals in Australia and have English as an additional language. He commenced his degree in 2013 and is studying part-time, enrolling in one unit each semester. Steven has not formally declared his autism to the university, as he does not see it as a 'disability' as such. Although Steven recognised that he was different to his family, his autism was not formally diagnosed until he was an adult, when his youngest child was also assessed and found to be autistic.

Unlike his parents or siblings, Steven loved school and excelled in all subjects. He realised from an early age that he wanted to know the answers to anything and everything, and a simple answer was usually not enough. He fondly recalls his interactions with teachers:

> *'I have driven them mad with 'why'? There was never an end to 'why'. 'But why, yes, I realise that, but why?'*

Steven has an overwhelming need for clarity and detail in the learning environment (and in life generally). If the unit design includes a multiplicity of resources, such as listening to a recorded lecture, reading notes, or listening to a podcast, it is imperative that it is clear what he is expected to do and what is optional. Steven may well choose to engage in all options and not be disturbed by the extra time he dedicates to study. The critical requisite is the provision of sufficient detail for Steven to know the purpose and structure of each strategy. He recognises that his needs are different to his peers:

> *'From the very beginning, it's got to be crystal clear and not too many possibilities. And I thought everyone was like that. But people have instincts, and mine are overridden by this logical process of elimination.'*

Recognising the time and effort required to examine all possibilities, Steven has put considerable energy into having the confidence to check with the teacher or academic staff member when he is feeling unsure about what he is expected to do. In an on-campus mode of learning, student uncertainty is more like to be noticed and responded to. In the online environment both noticing and responding appropriately may be more challenging, simply because of the fewer modes of communication. Steven emphasised:

> *'I need to ask the question and you need to realise that I don't know. And I need to see you realise because I will read your reaction into what I think, your words might not necessarily be enough.'*

During the interview, Steven revealed that he spends significant time engaging in the resources provided in the online learning space. Amongst these resources are recorded lectures, created via desktop computer capture. These recordings are approximately 25 minutes long and accompany the weekly notes or describe activities and assessment tasks in more detail. Steven revealed in an interview that he unfailingly listens to each recording 20 times. When asked why he feels compelled to do this, Steven offered this explanation:

> '*I have to listen to the lectures a large number of times for the same reason that I would count the pegs when putting the washing on the line. I don't think I need to do it to improve learning as much as I think I need to do it so I don't worry that I have missed something and I am only emotionally 'satisfied' after a certain number of 'listenings'... I will listen to a lecture many times in order to build a mind map of the information.*'

This is not necessarily stressful to Steven though, as he revealed:

> '*As strange as it might seem, I actually find lectures to be incredibly soothing. I use science documentaries (TV on a timer) every night to sleep, and that is every single night without fail. I have been doing this for 25 years or more. I have learned more about the secret life of plants and string theory than any normal person should.*'

Adding to the significant time Steven commits to engaging with online resources, he is also easily distracted while studying. This is not distraction in the usual sense (Facebook, online chats, and such like) but rather as a result of him feeling that something is not right. For example, spelling mistakes, ambiguous instructions, conflicting dates, and such like will cause his focus to slip completely, at the expense of his learning:

> '*If any of those issues were to arise... that is a distraction. I stop listening and then begin calculating through the possible meanings ... I can stare and stare at a spelling mistake for 15 minutes and then bang, I've just missed 15 minutes worth of whatever it was that is being said. I know I'm doing it and I try so hard not to do it but . . . I even stop breathing.*'

One of the biggest challenges Steven has experienced in an online environment has occurred when he is expected to collaborate with other students. These activities typically aim to help students to connect with the theoretical aspects of the unit, by comparing and contrasting the theory with their practical experiences as mature-aged students. They might include posting responses to the asynchronous Discussion Board, attending web-conferences, or contributing to group Wikis. Often these collaborations result in a product that will be useful to all students, such as an annotated bibliography of the unit readings constructed in a public Wiki space. For Steven, it is not the collaboration itself that is difficult. Rather, it is the distraction he experiences when he tries to understand the way other students behave. For example, a fellow student gave advice to Steven in relation to what they were required to contribute to a Wiki in another unit. Steven describes in the interview what occurred:

> '*She looked the wiki up and went, 'this is all you have to do. I go there and then just write a bunch of drivel, blah blah blah, blah blah blah. Some party line, catchy little quote, put your initials after it, click on done'. I thought, um, I'm sorry? I don't understand why you just did that, what possible benefit there could be for doing this? Why? Why? Why?*'

Steven's words reflect his desire for logic, both in how the learning environment is structured and also in how others behave in that environment. The more unpredictable the environment is, the more likely he will encounter what he describes as a 'roadblock', severely impacting his learning. Steven managed to contribute to another collaborative activity, however, and publicly acknowledged the potential for personal growth in the unit's Discussion Board:

> '*I am albeit gradually re-tuning my brain to think in a way which may help me to understand a situation which could prove extremely challenging to a purely logic oriented thinker. By forcing me to think outside the box I am flexing, sometimes painfully, brain muscles which I have never viewed as useful.*'

Despite these difficulties, Steven recognises that university offers him a place where he can feel very comfortable largely because of intellectual engagement with teaching staff and peers. This came as somewhat of a revelation to him:

> '*I have always found that face to face interactions cause considerable stress. The safe environment of the university has provided an opportunity to practice on people. I have always experienced difficulty communicating with the general public because I have had to pretend to be interested in their subject matter but in the university environment the people are simply extremely interesting and engaging.*'

Steven credits his university peers and teachers for sparking fostering his love for learning, because they are '*people with passion about what they're talking about….they're involved and they're engaged. [I thought] 'Wow, this is pretty different*.'

Discussion

The online learning environment offers significant affordances in higher education, both in terms of how learning is delivered and how the student interacts with the learning environment (Herrington et al., 2010; Osbourne & Houston, 2012). This 'new world' of education has enabled course designers and teaching staff to develop approaches that reflect a contemporary perspective on learning, such as the six design principles underpinning the course in which Steven is enrolled. For the majority of students, the applied, authentic approach offers a vibrant and engaging environment (Downing & Herrington, 2013b) but for Steven became a confusing, frustrating place, with both the mode of delivery and the pedagogical approach hindering his ability to participate academically and socially.

In a face to face classroom context, activities tend to happen in a lineal manner with each activity being explained and then supported by the teaching staff as they are completed. In an online environment there is often more of a smorgasbord, with a number of resources and activities present in the online learning space such as reading notes, recorded interviews, discussion boards and collaborative activities. Steven can find this overwhelming, not in an intellectual sense but in a procedural sense. He will worry about whether or not he is doing what he is expected to be doing. Graphic images, which are often inserted to brighten up web-pages or indicate a point at which students are expected to do something, can add to the confusion if they are not a logical representation for the accompanying text or activity (Moore, 2012). This is likely to be compounded if the images are animated. His experience in this unit highlights the critical need for clear instructions, ample support and sufficient time to master the technology. For Steven, such support is essential but all students may benefit from this approach. For example, there could be a short weekly web-conference, a dedicated

Discussion Board forum, or perhaps the option of a short weekly phone call with the lecture, to clarify any particular issue that may be confusing students.

Steven's online unit of study required him to collaborate with his peers in several activities, including contributing to a Wiki and maintaining his own blog during the semester. For Steven, the actions of another student completely discredited the value of the Wiki and he was unable to move on from trying to understand why the student behaved that way. Even more significantly, all Wikis were now of dubious value. Collaboration in online activities is acknowledged as challenging due to the reduced modes of communication, the asynchronous nature of interaction, and the dispersed hours that online students tend to study (Salmon, 2011; Thorpe, 2002). Yet the students in the course and the literature more broadly recognise the value of collaboration (Downing & Herrington, 2013a; Krause, 2005; Lave & Wenger, 1991). Again, it is not the intellectual complexity that challenges Steven; it is the nature of the unpredictable participation or (unintentional) misguidance from his peers. Strategies to support more effective collaboration between students could include the provision of a web-room for students to meet informally, the ability for students to email each other through the Learning Management System quickly and easily, and the scaffolding of collaborative activities in a way that allows sufficient time for student-to-student planning and organisation.

The design principles underpinning the course aim to give students an authentic learning experience, drawing upon both their academic and social interactions as they engage in activities. The very essence of authenticity is a lack of predictability and the ill-defined nature of a real-life problem (Herrington et al., 2010). In such activities, the aim is not so much for a 'correct' answer, but to encourage a well-considered, theoretically underpinned response to a particular situation. The value is in the reasoning provided and recognition that solutions to problems are multi-faceted and complex. For students like Steven, however, these types of activities can be very challenging as his natural inclination is to examine all possibilities equally and deeply. This leads him to go down many paths in his learning journey and he is likely to struggle with the ambiguity and lack of clarity. Steven does recognise the value in an applied, authentic approach, but needs to feel safe to negotiate alternative assessment tasks when necessary.

Conclusion

The AVVC guidelines (2006) require universities to provide all students with the opportunity to participate fully, both academically and socially. In an era of widening participation and rapid adoption of online learning platforms the need to better understand the experience of non-traditional students, including those with autism, is critical. A much deeper understanding of Steven was gained through the research process, and it appears that it was illuminating for him as well. It raises the question of whether or not Steven would have experienced this growth were it not for the research, and reiterates the value of embedding learning strategies that encourage all students to critically reflect on their meta-cognitive approaches, in order to foster personal and professional growth.

Most importantly, from Steven's perspective, is the need for the teaching staff to know that they have a student with autism. Of course, students do not have to disclose their condition but it should be in their interest for them to do so provided the information is managed professionally and usefully. It is clear that there needs to be an explicit focus on supporting diversity and encouraging news ways of participating and learning. While generalisations may not be possible, learning from one student can at least tune the ears and

eyes to others who are also struggling to make sense of a confusing world. What Steven needs will also be valued by his peers; clarity in the structure and layout of the online environment, well designed and supported learning activities, collaborative activities that are scaffolded and are meaningful, and teaching staff who are willing to flex assessment tasks in line with student needs.

The online learning environment and the embedded pedagogical approach in the course appear to have the potential to help students like Steven to develop new skills in identifying and exploring alternative interpretations and responses to situations. The barriers may never be completely removed, but they can be chipped away with the tools that come with increased knowledge. Accordingly, there is an urgent need for more research into the experiences of students with autism in higher education. The spectrum is wide, and the range of implications significant. In a global environment of widening participation, increased online offerings and a desire for a student-centred approach in higher education, hearing the voice of students like Steven is critical.

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