Neurodiverse students within higher education – initial thoughts from a collaborative project

Barbara Sandland, Andrea MacLeod and Neil Hall (Autism Centre for Education & Research (ACER), School of Education)
Contact: a.g.macleod@bham.ac.uk

Abstract

The term 'neurodiversity' is increasingly used to reference groups of individuals with cognitive differences including, but not limited to, those diagnosed with autism. Neurodiverse students make up an increasing proportion of students in higher education, and this is also true for doctoral studies, which has different expectations of the student, and through which the student engages differently with the academy. As part of a current HEFi-funded project which focuses on how neurodiverse doctoral students can best be prepared for their viva voce examination, we have interrogated the literature that looks at neurodiversity within higher education. We considered the diagnostic categories most commonly regarded as 'neurodiverse' within higher education, and what recommendations have been made for academic adjustments. We report here on our initial findings, their implications for our own project at the University of Birmingham, and for doctoral study within higher education more generally. Key considerations are the relatively high proportion of neurodiverse individuals who have co-occurring conditions and the issue of non-disclosure for students with unseen disabilities. We conclude that the principles of Universal Design for Learning (UDL) would potentially be of use to develop viva voce guidance which anticipates potential barriers, and we intend to explore this in the next stages of our project.

Background

In 2021/2022, approximately 14% of the 3080 Postgraduate Research (PGR) students registered at the University of Birmingham (UoB) disclosed a disability (Tableau data). Of these, 34% disclosed either social impairment (34) or learning disability (117). Although these categories are fairly blunt tools with which to identify specific conditions, we can safely assume that firstly, this figure is an under-estimate of actual numbers due to non-disclosure or lack of assessment evidence, and secondly, the majority of those conditions included could be considered to fall under the umbrella term of 'neurodiversity'. Therefore, neurodivergent students make up a significant proportion of our current disabled PGR population.

Common to most higher education institutions (HEIs), UoB does not currently record neurodiversity as a category of disability within application and disclosure documentation. However, there is a growing preference among students and staff for this term, which foregrounds cognitive diversity, rather than disability. Historically, neurodiversity has been used interchangeably with autism (Singer, 1999) but more recently, its use has broadened to encompass other conditions. To date, there is no one agreed definition.

We are a small team of neurodivergent and neurotypical academic staff from the Autism Centre for Education & Research (ACER) at UoB who have received funding from the Higher Education Futures institute (HEFI) to undertake a collaborative project, which aims to enhance understanding of neurodivergent students' experience of adjustments and needs for the PhD viva, and in doing so develop a tool that facilitates neurodivergent students and their supervisors to plan reasonable adjustments that reflect the student's need, not just their label.

In this article, we present key points arising from our scoping review, and use its findings to explore current understandings of neurodiversity as used within higher education, with the aim of concluding what it means to refer to a student as neurodivergent, the implications of co-occurring conditions and the ways in which these considerations inform the next stages of our project.

Defining neurodiversity

The term neurodiversity was coined in the 1990s by sociologist Judy Singer, to frame autism as a variation of cognitive functioning that exists within the human species and move away from deficit interpretations. Figure 1 provides an illustration:

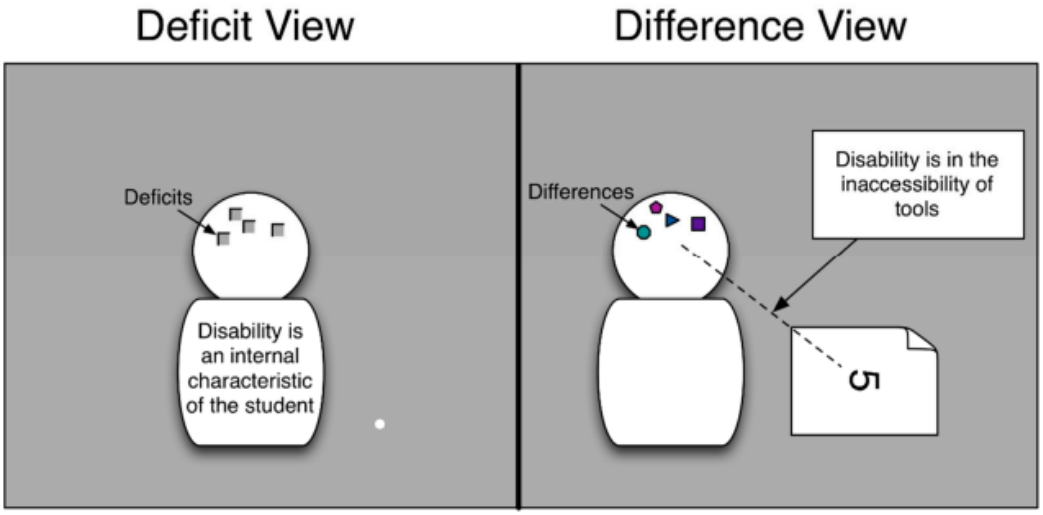

Figure 1: Lewis and Lynn (2018)

The neurodiversity movement has since been embraced by autistic communities, who sought to express their experiences of the world as different, not deficient. If taken in its original form, as used by Singer (1999), neurodiversity was the natural variation that could be seen across all human beings. Walker (2014) proposed the following definitions:

- Neurodiverse or Neurodiversity is a recognition of the naturally occurring diversity in human brain function.
- Neurodivergent (ND) as a term that refers to an individual who mind functions differently to the dominant societal norm.
- Predominant neurotype (PNT) refers to "*individuals whose brain functioning is more typical or dominant and distinct from the ND brain, and so more 'average.'*"

A further exploration is provided in Figure 2:

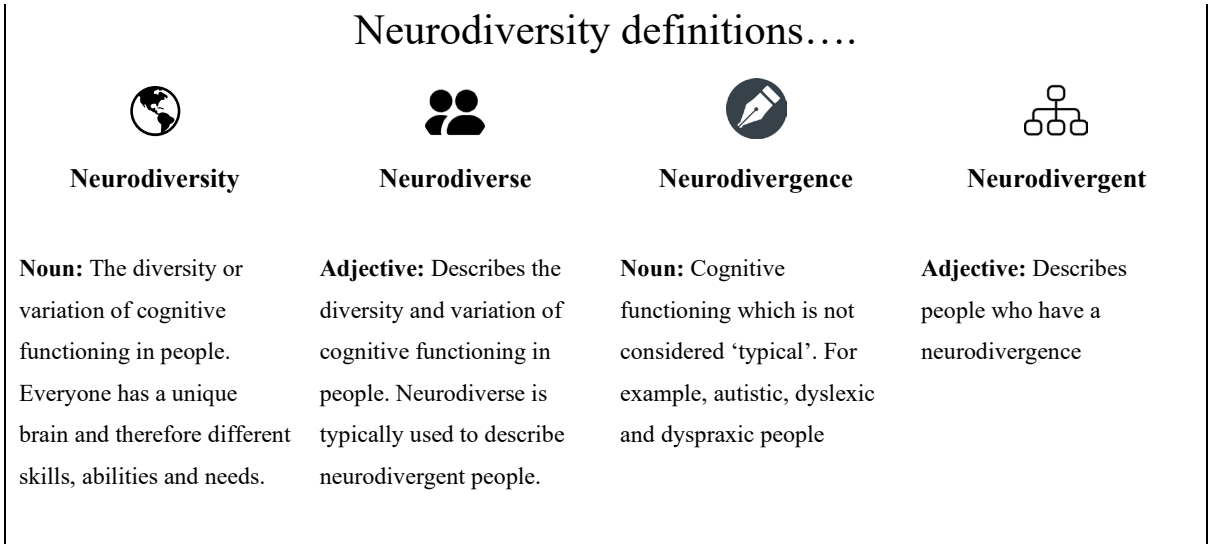

Figure 2: https://exceptionalindividuals.com/neurodiversity/ (2022)

Neurodivergence therefore is the noun used to refer to a wide group of individuals whose cognitive functioning is perceived as different from the Predominant Neurotype (PNT). The limited literature exploring neurodivergence in higher education makes establishing an accurate definition to be used across the University challenging. From the literature explored here, the authors propose that, based on current understanding, the term neurodivergence should be used as a collective noun to describe individuals identifying with the following:

- Autism
- Attention Deficit Hyperactivity Disorder (ADHD)
- Dyslexia
- Dyspraxia/DCD
- Dyscalculia
- Tourette's Syndrome
- Developmental Language Disorder
- Speech differences e.g. stutter, apraxia.
- Auditory processing differences e.g., auditory processing disorder (APD)

Methodology

For the first phase of our project we conducted a scoping review of research relating to neurodiverse students within HE, the processes of which are summarised in Figure 3:

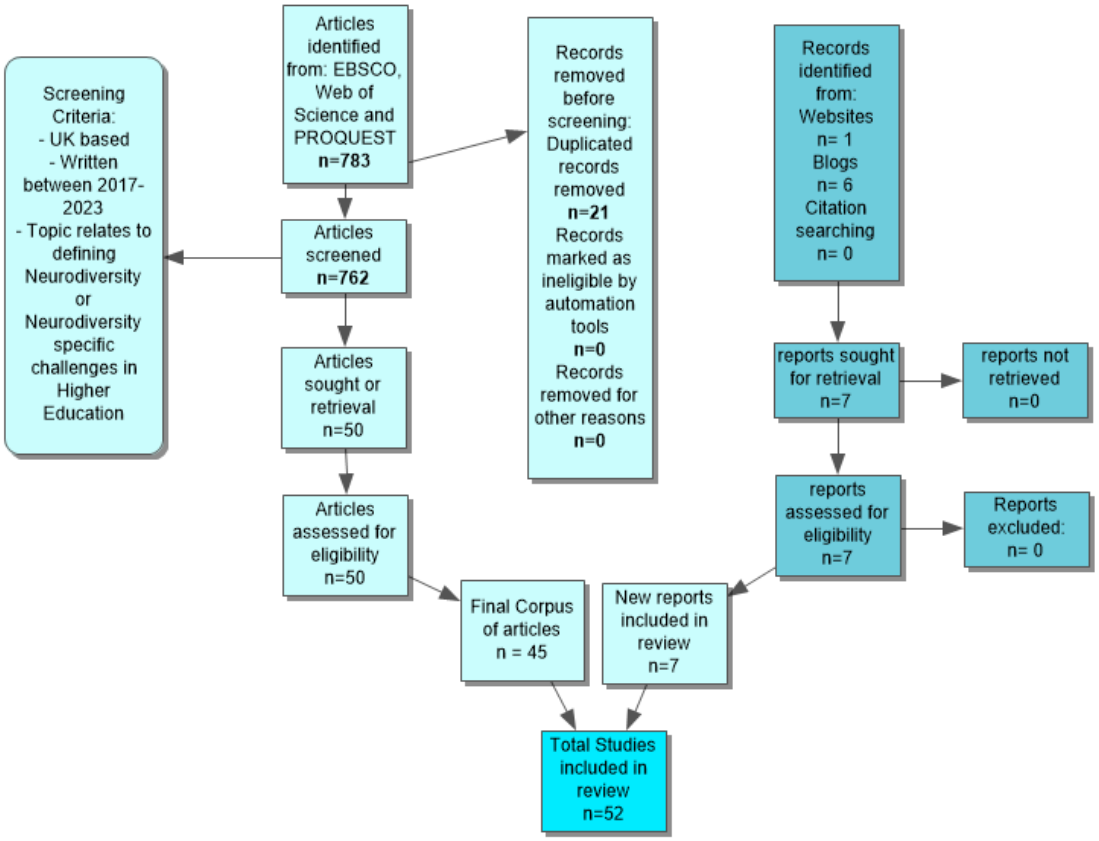

Figure 3: PRISMA (2020)

For each disability under the umbrella term of neurodivergence, the literature was read, and difficulties identified that could place the student at a "*substantial disadvantage in comparison to students without disabilities*" (*Equality Act*, 2010, p. 10).

An increased level of reliability was achieved in compiling a comprehensive list, by ensuring that a balance of academic research focusing on the diagnostic criteria and first-hand personal experiences were used. Furthermore, while most articles reflected on the focus of childhood presentations in the diagnostic criteria, the incorporation of adult experiences, ensures the recognition of the potential differences in the support needs of adults. It is

acknowledged that the majority of the literature focuses on undergraduate study and written exams, therefore we assessed whether the noted barriers to success could also apply in relation to the doctoral viva specifically, since this is a significant requirement of doctoral studies.

Through analysis of the available literature, it became evident that some barriers to learning were common to more than one neurodivergent condition. To explore this further, the key barriers identified were themed and cross-referenced (see Figures 4-10 in Appendix) across neurodiversity categories.

We do not have space here to comment in detail on these findings, except to highlight that they provide a useful starting point from which to explore the profiles of different conditions under the neurodiversity umbrella. They provide some illumination of what is common to all, and what is specific. Most importantly, they provide a potential framework through which we can consider the implications of co-occurring conditions. The impact of intersecting conditions has largely been neglected within the literature.

There is relatively little research that specifically references the challenges faced by neurodivergent postgraduate students. The difficulties outlined here are taken from the available literature and are therefore based predominantly on undergraduate studies. We recognise that this list may therefore be incomplete and consider that further research is needed, with a focus on neurodivergent students taking doctoral studies.

We also note that, in listing challenges faced by many neurodivergent students, we arguably focus on a deficit-based support system, which does not fit within the neurodiversity paradigm. The strengths associated with each neurodivergent condition are not listed here but they are equally important in ensuring student success. Incorporating this into future research would ensure a more balanced picture, and we intend to include this in our current project.

Other considerations

As previously stated, the aim of the neurodiversity movement was to move away from a deficit-based 'medical model' of disability. Therefore, when we use the language of neurodiversity, we must accept that this should also reflect a wider cultural shift in the way we view disabilities.

Nieminen and Pesonen (2022) argue that as the academic degree has become a necessity in 'modern knowledge societies', HEIs are welcoming a much more diverse student population. Yet despite this, and the increase in neurodiversity terminology, there remains an ethos within many HEIs that disabilities/neurodivergence are a deficit to the student's study that will likely hinder their achievement.

> "A societal stigmatization of disabledness and neurodiversity overshadows higher education: abnormality and unproductivity are recognized and devalued in higher education" (Nieminen & Pesonen, 2022, p.3).

As research suggests, there is an increasing number of neurodivergent students entering higher education (Clouder *et al*., 2020). It is therefore becoming increasingly important to address this gap in knowledge and understanding in HEIs.

We would like to introduce the concept of Universal Design for Learning (UDL) here and consider why it might be a particularly appropriate approach for doctoral students. The theoretical foundations of UDL lie in the belief that every human being is different, and therefore planning for this diversity is needed from the beginning of any design process (Sanger and Gleason, 2020). Its focus on human diversity therefore fits very naturally with the principles of neurodiversity. In employing a UDL approach, universities can demonstrate that a diverse student population is valued, rather than a minority that needs adjustments to enable participation (Waisman *et al.*, 2023; Cox *et al.*, 2021). In the next stages of our project, we intend to investigate, along with current neurodiverse doctoral students and the staff who support them, how we can employ the principles of UDL to render the viva voce more inclusive to neurodiverse candidates.

There are further benefits of a UDL approach, when we consider that disclosure and diagnosis are recognised as prerequisites for support in most HEIs. Research suggests that HEIs should encourage students to declare their disability prior to entry (Jacklin, 2011), however there is no compulsion for students to do this (Carey, 2012). While researchers have highlighted the benefits of disclosing (Cunnah, 2015), it is equally well documented that many students choose not to do so. For some this is due to fear of stigmatisation, and being treated differently (Jacobs *et al.*, 2022; Kendall, 2016; Hargreaves *et al*., 2014). For others it may be that they do not identify as disabled (Shakespeare, 2006), or wish to re-invent themselves at university (Madriaga, 2007). Ryder and Norwich (2019) argue that some students are also 'put off' disclosing due to the subsequent requirement of proving a diagnosis through written evidence, alongside the need to justify that their difficulties are 'bad enough' to warrant support (Beck, 2022). We would argue that the issue of disclosure is of particular significance for doctoral students. Almost by definition, the majority of these students wish to pursue an academic career. Therefore, supervisors and other staff within their setting are not just a part of their studies but may be their future line managers and colleagues. Doctoral students often seek employment as tutors and research fellows whilst they are studying. They may therefore be especially sensitive to highlighting any perceived weakness or disclosing something that may put them at a disadvantage within the highly competitive environment of academia.

Conclusion

We have undertaken this scoping review as part of our wider project, which will work in collaboration with neurodiverse doctoral students and their supervisors to explore how the viva voce can be rendered more inclusive and accessible and how academic staff can best be supported in their roles. The literature considered here has enabled us to present and investigate a definition of neurodiversity that seems to best reflect current usage. We also acknowledge that neurodiversity is an emerging 'movement' and therefore changes and challenges should be expected and welcomed. Identification of common and specific traits within different neurodivergent conditions is of particular significance and within our project we will explore the implications in relation to dual and multiple diagnoses, as they co-occur within individuals. We will also explore further the ways in which the principles of

Universal Design for Learning may be employed as a means of ensuring an inclusive viva voce experience is available to all neurodiverse PGR students, with or without formal disclosure.

References

Beck, S. (2022) 'Evaluating the use of reasonable adjustment plans for students with a specific learning difficulty', *The British Journal of Special Education*. 49 (3), pp. 399-419.

Carey, P. (2012) 'Exploring variation in nurse educators' perceptions of the inclusive curriculum', *International Journal of Inclusive Education*, 16, pp. 741–755.

Clouder, L., Karakus, M., Cinotti, A., Ferreyra, M.V., Fierros, G.A., and Rojo, P. (2020) 'Neurodiversity in higher education: a narrative synthesis', *Higher Education*. 80, pp. 757-778.

Cox, B.E., Edelstein, J., Brogdon, B., and Roy, A. (2021) 'Navigating challenges to facilitate success for college students with autism', *The Journal of Higher Education*, 92(2), pp. 252–278. https://doi.org/10.1080/00221546.2020.1798203.

Cunnah, W. (2015) 'Disabled students: Identity, inclusion and work-based placements'. *Disability and Society,* 30, pp. 213–226.

Exceptional Individuals (2020) 'Neurodiversity & Neurodivergent: Meanings, Types & Examples'. https://exceptionalindividuals.com/neurodiversity/ (Accessed: 11 November 2022)

Hargreaves, J., Dearnley, C., Walker, S., and Walker, L. (2014) 'The preparation and practice of disabled health care practitioners: Exploring the issues', *Innovations in Education and Teaching International*, 51, pp. 303–314.

Jacklin, A. (2011) 'To be or not to be 'a disabled student' in higher education: The case of a postgraduate 'non-declaring' (disabled) student'. *Journal of Research in Special Educational Needs*, 11, pp. 99–106.

Jacobs, L., Parke, A., Ziegler, F., Headleand, C. and De Angeli, A. (2022) 'Learning at school through to university: the educational experiences of students with dyslexia at one UK higher education institution', *Disability & Society*, 37 (4), pp. 662–683.

Kendall, L. (2016) 'Higher education and disability: exploring student experiences', *Cogent Education*, 3 (1), 1256142.

Kirby, A. (2022). *Neurodiversity Map*. Available at: https://www.linkedin.com/feed/update/urn:li:activity:6984078558302191617/ (Accessed: 15 February 2023)

Legislation.gov.uk. 2010. *Equality Act 2010.* Available at: http://www.legislation.gov.uk/ukpga/2010/15/contents (Accessed: 10 November 2022)

Madriaga, M. (2007) 'Enduring disablism: Students with dyslexia and their pathways into UK higher education and beyond', *Disability & Society*, 22(4), pp. 399-412.

Nieminen, J.H., and Pesonen, H.V. (2022) 'Anti-ableist pedagogies in higher education: A systems approach', *Journal of University Teaching & Learning Practice*. 19(4).

Ryder, D. and Norwich, B. (2019) 'UK higher education lecturers' perspectives of dyslexia, dyslexic students and related disability provision', *Journal of Research in Special Educational Needs*, 19 (3), pp. 161-172.

Sanger, C.S. (2020) 'Inclusive pedagogy and universal design approaches for diverse learning environments', in Sanger, C.S. and Gleason, N. (eds.) *Diversity and inclusion in global higher education: Lessons from across Asia*. Singapore: Palgrave Macmillan, pp.31-71.

Shakespeare, T. (2006) *Disability rights and wrongs*. London: Routledge.

Singer, J. (1999). 'Why can't you be normal for once in your life?' in M. Corker and S. French (eds), *Disability discourse*. Open University Press: Buckingham, pp. 59–67.

Waisman, T.C., Williams, Z.J., Cage, E., Santhanam, S.P., Magiati, I., Dwyer, P., Stockwell, K.M., Kofner, B., Brown, H., Davidson, D., Herrell, J., Shore, S.M., Caudel, D., Gurbuz, E., and Gillespie-Lynch, K. (2023). 'Learning from the experts: Evaluating a participatory autism and universal design training for university educators', *Autism*. 27 (2), pp. 356-370.

Walker, N. (2014). Neurodiversity: Some basic terms and definitions. Available at*: Neurocosmopolitanism: Nick Walker's Notes on Neurodiversity, Autism, and Cognitive Liberty*. https://neuroqueer.com/neurodiversity-terms-and-definitions/ (Accessed: 19 April 2023)

Appendix: Cross-referencing of barriers to learning found in the literature, listed according to diagnostic condition

		Dyslexia	Autism	ADHD	Tourette	DLD	Dyspraxia	Dyscalculia	Speech
executive functioning: Organisation	Difficulties with maintaining attention	■	■	■	■				
	Difficulties with organisation	■	■	■	■		■		
	Difficulties processing verbal information	■	■	■		■			
	Short term memory Difficulties	■		■					
	Difficulties with working memory	■	■	■	■	■	■	■	■
	Difficulties retrieving long term memory	■							
	Requires more Processing time	■	■	■	■	■	■	■	■
	Difficulties with Self-Determination (problem solving, decision making)		■		■				
	Difficulties with time management		■	■	■		■	■	
	Cognitive Inflexibility (predictability and routine)		■						
	Unspecified executive function		■	■		■		■	

Figure 2: Intersectionality of challenges in HE: Executive Functioning: Organisation

		Dyslexia	Autism	ADHD	Tourette	DLD	Dyspraxia	Dyscalculia	Speech
Verbal Language	Less elaborate vocabulary	■	■			■			
	Ability to convey knowledge through verbal language	■	■			■		■	■
	need for unambiguous questions		■						
	Difficulties asking questions		■						
	possible fluency of speech differences		■		■	■			■

Figure 3: Intersectionality of challenges in HE: Verbal Language

		Dyslexia	Autism	ADHD	Tourette	DLD	Dyspraxia	Dyscalculia	Speech
executive functioning: Regulation	Higher Anxiety	■	■	■	■	■	■	■	■
	Lower Self-Esteem	■	■	■		■	■	■	■
	Difficulties managing Unexpected Situations	■	■						■
	Difficulties managing stressful situations	■	■	■	■				■
	Perfectionism	■	■	■					
	Sensory Sensitivities	■	■	■	■				
	Difficulties managing emotions (expressed through behaviours)		■	■					
	Self-Stimulatory/soothing behaviour		■	■					
	difficulties with self-motivation		■	■					
	Impulsivity		■	■					
	Forgetfulness			■					

Figure 4: Intersectionality of challenges in HE: Executive Functioning: Regulation

		Dyslexia	Autism	ADHD	Tourette	DLD	Dyspraxia	Dyscalculia	Speech
Social Interaction	Difficulties understanding other people's thoughts/feelings		■						
	Difficulties understanding non-verbal communication		■						
	Difficulties with social communication		■			■			■
	Higher social anxiety		■			■	■		■

Figure 5: Intersectionality of challenges in HE: Social Interaction

		Dyslexia	Autism	ADHD	Tourette	DLD	Dyspraxia	Dyscalculia	Speech
Physical	Hyperactivity/Restlessness		■	■			■		
	Involuntary movements/tics				■				
	Higher levels of Fatigue		■	■	■		■		
	clumsiness						■		
	Requires consideration of staff positioning to avoid implications of powerful tic actions				■				

Figure 6: Intersectionality of challenges in HE: Physical

		Dyslexia	Autism	ADHD	Tourette	DLD	Dyspraxia	Dyscalculia	Speech
Literacy	difficulties with reading complex text	■			■	■			
	difficulties with essay organisation	■					■		
	difficulties with spelling and vocabulary choice in academic writing	■				■	■		
	difficulties with study strategies and metacognitive skills	■	■	■			■		
	difficulties with note taking	■	■	■	■	■	■		
	difficulties expressing oneself in written form	■				■			

Figure 7: Intersectionality of challenges in HE: Literacy

		Dyslexia	Autism	ADHD	Tourette	DLD	Dyspraxia	Dyscalculia	Speech
Numeracy	High levels of maths anxiety							■	
	Difficulties finding new locations						■	■	
	difficulties memorising number facts	■						■	
	Difficulties with concepts of Time		■				■	■	

Figure 8: Intersectionality of challenges in HE: Numeracy