



## Doctorate Studies

# Accessing the curriculum; university based learning experiences of visually impaired physiotherapy students

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## ABSTRACT

The aim of this study was to explore the learning experiences of visually impaired physiotherapy students in the UK, specifically focusing on barriers and enablers faced within university and classroom based education.

A qualitative multiple case study design was used due to the unique and small group of participants under exploration. Course Leaders of all universities in the UK that offered Physiotherapy education at undergraduate or pre-registration level were approached as gatekeepers to access participants. Four visually impaired physiotherapy students consented to take part in the study, each from a different institution.

Semi-structured interviews were used at a time and setting chosen by each participant. Data were recorded and transcribed verbatim, and analysed thematically using NVivo 10. Both barriers and enablers were identified, with sub-themes within the data; the **barriers** were: **environmental factors, unsupportive behaviours and time and effort**. The **enablers** were: **supportive relationships, student attributes, and strategies and adaptations**.

All participants experienced **barriers** to learning within their university setting, despite having disclosed a disability and having access to and provision of reasonable adjustments. However, despite facing barriers, there were many positive experiences that **enabled** learning, particularly when staff and students worked together in an open, supportive, and proactive environment.

## 1. Introduction

This paper discusses the learning experiences of four visually impaired physiotherapy students from four different universities in the UK, focusing on their experiences of university and classroom based learning. This study built upon an exploratory study of three visually impaired physiotherapy students within a single UK university (Frank et al., 2014).

Physiotherapy has a unique history in the education and inclusion of visually impaired people who have long been accepted and valued as physiotherapists. Historically, student physiotherapists undertook their training at the RNIB School of Physiotherapy in London (Barclay, 1994; Atkinson and Owen-Hutchinson 2005, 2013; Owen-Hutchinson and Atkinson, 2010). Since its closure in 1995, visually impaired students have chosen where they would like to study physiotherapy, reflecting student choice and principles of inclusive higher education.

All registered healthcare professions offer approved and validated pre-registration university education courses, to ensure that appropriate standards are met for practice. The HCPC (Health and Care

Professions Council) who approve physiotherapy courses, and the NMC (Standards Framework for Nursing and Midwifery Education) have specific standards and requirements to ensure that student and registered healthcare professionals are treated fairly and equitably within the premise of the Equality Act (Legislation.gov.uk, 2010; The Equality Act), during their professional pre-registration education, and in practice once they qualify (HCPC, 2015). The Equality Act (2010), guidance from the Quality Assurance Agency (UK Quality Code 2013) and a recent paper from the Department for Education (2017) all state that the provision of anticipatory reasonable adjustments ensures that disabled students can access Higher Education (HE) where registered healthcare professionals such as nurses, midwives, physiotherapists, occupational therapists, paramedics and others gain their qualifications.

Healthcare students are encouraged by their regulators (HCPC, 2015, Nursing and Midwifery Council, 2018) to disclose any disability to their HEI, to ensure that support can be provided in university classroom-based and practice based education; access to education should not be limited by disability (Moran, 2009; Veck, 2007). In relation to nursing, Hargreaves and Walker (2014 p.1752) suggest that

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disabled students should not pose any greater difficulty in demonstrating “fitness to practice” provided that disclosure is made, and support and reasonable adjustments provided. Indeed, the [Nursing and Midwifery Council \(2018\)](#), [HCPC \(Clouder, 2013; HCPC, 2015\)](#) and the Chartered Society of Physiotherapy ([CSP, 2012](#)) have published guidance to enhance inclusion and support for disabled students, including those who are visually impaired ([Owen-Hutchinson and Atkinson, 2010](#)). However, despite this, barriers to entry and practice as a healthcare professional for disabled students remain.

“Barriers and enablers” are terms that feature in the International Classification of Functioning, Disability and Health (ICF) ([WHO 2010](#)). Unlike the social model that suggests that disability is caused by society, culture, economic constraints and the environment ([French and Swain, 2008 p.28](#)), the ICF considers how both impairments and environmental factors act as barriers and/or enablers, affecting participation in society for disabled people, which includes going to university and training for a career ([WHO, 2010](#)), such as physiotherapy. The ICF provided an underpinning theory of participation for this study, enabling exploration of the factors that affected participation in university and classroom-based learning for the participants.

The experiences of disabled students in HE has received a great deal of attention in recent years, especially in relation to dyslexia and specific learning difficulties ([MacCullagh et al., 2016](#)) with a recent study reiterated that students were still experiencing challenges with disclosure and identity, and were facing negative experiences of higher education ([Kendall, 2016](#)). As there is evidence to suggest that more students are disclosing disabilities in healthcare education ([Ryder and Norwich, 2018](#)) this poses a potential problem for healthcare students, who are choosing to enter, and are the future of the healthcare professions. Specific research into the experiences, barriers and enablers of disabled students in different professions such as Medicine ([Miller et al., 2009](#)), Occupational Therapy ([Gitlow, 2012](#)) and Nursing ([Ryan, 2011; Wray et al., 2013; Tee and Cowan, 2010](#)) exists, identifying many barriers and enablers to learning. In relation to healthcare education, disabled nursing students continued to face poor attitudes towards them from their colleagues ([Shpigelman et al., 2016](#)), supporting previous claims of inadequate inclusion in higher education ([Claiborne et al., 2011, Papadopoulos and Goudiras, 2004; Kioko and Makoelle, 2014](#)). The literature has also shown that disabled students require additional time and “emotional” effort to study, suggesting that their experiences in learning are challenging and more time-consuming than non-disabled students ([Goode, 2007; Mullins and Preyde, 2013; Magnus and Tossebro, 2014](#)). Whilst this is a significant problem for the students, it has ramifications for educators in university who must provide inclusive and accessible learning for students ([Department for Education, 2017](#)). In relation to physiotherapy, [Frank et al. \(2014\)](#) identified that visually impaired physiotherapy students needed to be highly motivated and strategic with their time and effort to successfully complete their studies. Although little research has specifically considered visually impaired students in HE ([Bishop and Rhind, 2011; Reed and Curtis, 2012](#)), and only one has considered physiotherapy students ([Frank et al., 2014](#)), all three authors confirmed that barriers to learning were encountered. These were specifically in relation to visual teaching methods, reliance on reading, difficulty using adaptive technologies, and access to demonstrations or visual media. These authors also suggested that support was inadequate, indicating that resources, and staff attitudes were poor, supporting the findings of [Shpigelman et al. \(2016\)](#). However, there was also evidence of enablers which supported participation in higher education reflecting the ICF. This study therefore sought to explore both barriers and enablers in university and classroom based education, to offer insight into the experiences of four visually impaired physiotherapy students to facilitate inclusion in physiotherapy education. The following research questions were posed:

1. What barriers do visually impaired physiotherapy students

experience in university-based learning?

2. What are the individual strategies, factors or behaviours that enable learning physiotherapy for visually impaired student physiotherapists in university and the classroom?

Whilst the participants were unique to physiotherapy, the author was interested in inclusion and participation, hence the underpinning of the ICF. The discussion considers to what extent the findings from this group of students can be reflected in wider higher and healthcare education, to facilitate inclusion and accessibility for all.

## 2. Methods

A multiple case study approach using qualitative methods was used due to the “bounded” participant group; visually impaired physiotherapy students ([Thomas, 2011 p.23](#)). Ethical approval was gained from the University of Birmingham. Participants were sought using gate-keepers (course leaders of all pre-registration physiotherapy courses in the UK) to maintain confidentiality. Each gatekeeper sent out information to their students that met the inclusion criteria; *students with a disclosed visual impairment on a recognised physiotherapy course in the UK*. Interested participants then contacted the researcher direct; four participants from four different universities consented to participate.

## 3. Data collection

An in depth semi-structured interview considering both barriers and enablers to learning physiotherapy was used face to face in a location and time chosen by the participant. Each interview lasted around an hour; the participants were keen to share their experiences of learning physiotherapy. Interviews were recorded and transcribed verbatim, and were sent to each participant in their preferred format for checking prior to analysis. Participants were asked how they would like to be described in the written text and were referred to as P1 to P4; each confirmed that their interview was a clear and correct representation of what they had said and were happy being described as visually impaired.

## 4. Findings

Thematic analysis of the data was carried out using the ICF to structure, and identify the themes. There were clear factors that affected participation in learning for the visually impaired participants, both negatively (barriers) and positively (enablers).

## 5. Factors that create barriers in university based learning

Three major themes that created barriers to learning physiotherapy in the university and classroom were identified from the data; **environmental factors, unsupportive behaviours and time and effort**.

### 5.1. Environmental factors

Barriers were faced in **the learning space** due to not being able to see written information in class:

*“We all sit in the middle and we’ve got two whiteboards and then the lecture slides above. Whenever they want to demonstrate anything they’ll write on the whiteboard, but, I’m sitting a good 20m back.” (P4)*

The distance from the board was not the only barrier:

*“... they dim the lights for the PowerPoint, and I can’t see in low light .... If it’s really necessary to read then, I’ll strain to do it.” (P4)*

*“I don’t like the whiteboard, but I take a picture of it ... Sometimes they’re not that clean so it doesn’t come out as well”. (P2)*

The contrast of colours in visual media created further barriers:

*“... with whiteboards ... green pen or a light colour ... it's really hard to distinguish .... I prefer light on dark or dark on light.” (P3)*

Although **visual resources** were generally provided, they were not fully accessible:

*“They'll give us a paper handout, but it's really like in size 10 or size 8 fonts even sometimes, so .... I can read it, but for just only very, very short periods of time.” (P4)*

Purposely blank slides in PDF and PowerPoint also reduced access to information, and participation in class:

*“... they do animations where every time I press space then something appears. When you get the PDF nothing is there, so you get a lot of blank slides. Obviously, it's designed [for the students] to fill in the gaps when they're watching the PowerPoint, but I can't see it .... ” (P4)*

Inaccessible resources were not the only factor:

*“ .... the kind of eye strain and headaches associated with it, if you have to read it for longer than ten seconds or so.” (P4)*

Accessing textbooks in the library was physically and visually difficult:

*“... reading the spines .... especially on the bottom shelf, I really have to like commando crawl through the aisles to get the relevant books.” (P4)*

Some **teaching methods** created barriers. Concepts that were accessed and understood by sighted students created difficulties, even where careful spoken explanations were given:

*“Even if it was described in the most wonderful way it was still quite difficult ..... Like neuro when they talked about nuclei you really need a visual to understand the loops and they used a picture for the students. Even if you are a brilliant lecturer it's still quite a difficult thing to get clear without pictures.” (P1)*

Learning applied anatomy using each other as models caused other problems:

*“There's body surface marking ... it's usually demonstrated on one person at the front and so everyone gathers round .... I can't really see.” (P4)*

## 5.2. Unsupportive behaviours

Unsupportive **attitudes** towards reasonable adjustments were experienced, some negative and some laissez-faire:

*“I spoke to the Head of Programme lots of times and it never got dealt with ... I think it was bad communication ....” (P1)*

Although support was provided in most cases, limitations and **inconsistent** provision reduced access to the curriculum:

*“It's quite hit and miss .... It usually starts off once they've been reminded and then they'll go back downhill again.” (P4)*

Although unsupportive attitudes were experienced, **lack of awareness or insight** into individual students' needs appeared to emphasise this barrier:

*“... in exams they enlarge the actual paper and it was like an absolutely massive newspaper ....they used to put like three tables in a row for me, so I used to be singled out at the front with these massive tables with this massive newspaper unfolding and everybody would get annoyed ....” (P4)*

## 5.3. Time and effort

All four participants identified that they put in a significant amount of additional time and effort into their studies:

*“Lots of things take longer to do myself than they do for other people .... learning to touch type as I look at the keys and don't look at the screen and I won't know if I've deleted things.” (P3)*

*“Because I am slower, I need more time [to find bony points] .... because I am taking much longer than the others to learn I need more people to be there to help me learn. It's not always that helpful, they rush it ... that is frustrating!” (P2)*

**Reading** created barriers in terms of time and effort:

*“I do have to spend a lot more time than other students on it with regard to reading journals .... I was always working much harder cos I would do a lot of reading before the lecture so I was one step ahead .....” (P1)*

*“I used to have an electronic magnifier .... The problem then is you don't get too much text on it and you always have to move it, especially when you're reading like a large chunk of text.” (P4)*

**Resources** as reasonable adjustments created additional time and effort:

*“I use JAWS for the computer, and I had to learn that at uni ... It's quite difficult to get good training so I'm still working on it to be honest!” (P1)*

Despite having access to electronic text books, they were not particularly user-friendly:

*“I've only got Gray's Anatomy electronically. That's still quite difficult because you can't flick between the pages; you have to go through like the folders with the different topics in it.” (P4)*

## 6. Factors that enable university based learning in physiotherapy

There were three major themes about the factors that enabled learning in university and the classroom for the visually impaired participants. Each theme contained subsidiary themes:

- **Supportive relationships** (being accessible and approachable and working together)
- **Student attributes** (communication skills, being organised and being self-aware (including disclosure))
- **Strategies and adaptations** (being a model, individual enablers, learning by doing and extra time)

### 6.1. Supportive relationships

Overall, there were many specific 'human' traits within the supportive relationships theme that ensured access to the curriculum. Positive learning experiences were enabled by the development of collaborative and supportive relationships between academic staff, support workers, and student peers. Supportive relations were exemplified when academic staff would share disclosure information which enabled them to respond supportively:

*“I have a student agreement thing and that was given to all of my lecturers so all of them know about it.” (P3)*

For one participant who had not previously disclosed his visual impairment, the disclosure became an enabler:

*“Once all the teachers were aware of it, provisions started slowly coming into place.” (P4)*

All participants mentioned that their lecturers were **accessible and approachable**, taking time to check on them during practical sessions,

and to make sure that they could access the teaching activity:

*“Even if I wasn't the model, [they] would come and go through it with me in class one to one and demonstrate and make sure I understood it.” (P1)*

It was clear that the lecturers were aware that the visual nature of physiotherapy assessment could create barriers:

*“Last week we were analysing gait and so they check if I'm alright with it. That's nice ... they can see that there's something that might be a bit more difficult, so they come and check so they know I'm getting on alright.” (P3)*

There was clear commitment to being available to the students outside of class, again demonstrating that academic staff were supportive of students' needs:

*“Most lecturers are happy for me ... to knock on their door; it's good that they're helpful.” (P3)*

*“They will go over it with me when I need extra time, I was lucky in that respect.” (P1)*

Having access to supportive staff was a new experience for one participant:

*“This university is the only place where I have ever had any support or help. Before I came here, I just had to get through life all by myself, with my parents as much as they could help.” (P2)*

**Working together** was very important in enabling learning. Participant 1 worked closely with a support worker; the success of this supportive relationship was understanding and awareness of support needs:

*“They know how I work best, better than anybody, even the lecturers 'cos they're working with me all the time. But although this sounds quite bad, they're just there to be my eyes.” (P1)*

The absolute importance of the relationship between Participant 1 and her support worker was clear:

*“The lecturers ... don't have the time that my support worker does ... . If I hadn't had her, I wouldn't have coped.” (P1)*

A further enabling factor for learning was supportive **peers**; working together facilitated support and created a learning environment where knowledge was shared:

*“The other students (were) so helpful, ensuring that I understood. They gradually learnt what I could and couldn't understand. Without that ... it would have made my life very difficult.” (P1)*

*“Everyone seems to know different things, so we learn from each other.” (P3)*

However, although having supportive peers was helpful in enabling learning, this was not felt to be unique:

*“You learn from each other anyway whether you're visually impaired or not!” (P1)*

Working with peers also provided a bridge between the lecturer and the participant; if there were difficulties participating in a class, for example where the emphasis was on a visual teaching method, their peers would provide support;

*“The other students were fab, they were really helpful if I didn't understand ... it was sometimes difficult to follow in the class, especially in 3<sup>rd</sup> year (with) very specific techniques.” (P1)*

*“... if I don't understand something, I get them to explain it.” (P3)*

The support of peers was absolutely clear for Participant 3 where formal support had not been provided:

*“I had an essay to do in the first few weeks, so I just had to get on and get*

*by with my friends helping me to get books.” (P3)*

Interestingly Participant 4 reflected on his resit year where he felt that working together more closely with his peers would have enabled learning for him:

*“I think one thing that I should've utilised more is the group sessions with other people, because everyone basically pools their knowledge. I've always been quite happy being independent, but it's just something that might make it a bit easier because everyone obviously talks (about it) and so you listen, and it usually sinks in.” (P4)*

## 6.2. Individual student attributes

The findings showed that the participants demonstrated individual attributes that enabled learning, such as **communication skills**, **being self-aware (including disclosure)**, and **being organised**. Having good **communication skills** was key in establishing relationships for participant 1, who re-sat a year and joined a new cohort:

*“I'm very talkative and sociable. The new group I'm with is much better, I get on with everyone. They're fine with me!” (P1)*

Communication skills were important to ensure support was accessed from Disability Team staff:

*“You do need quite a lot of input at times really, so it was good to have a good rapport with them so that helps.” (P3)*

Participant 1 was very **self-aware** of her learning and support needs, and was able to **communicate** well, expressing and sharing these with her lecturers and peers:

*“I think the reason it has been positive at the uni overall is because of me, I've been very open and I won't let anything stop me and I'm not afraid to say something if I'm not happy. Now, the uni are well aware of my needs and they meet them and can adapt ... .I've had to fight for a few things, and I've made them a lot more aware ...” (P1)*

Being self-aware and confident to disclose enabled the participants to gain support:

*“I have a student agreement thing and that was given to all of my lecturers so all of them know about it.” (P3)*

Being self-aware and having good communication skills enabled the participants to ask for help:

*“I'll just ask the people I'm working with to help.” (P3)*

Participant 2 found asking more difficult, although his lecturers were very supportive:

*“I should just not think and worry that she would tell me I was doing the wrong thing. I think it's having been told previously that I was too thick by teachers ...” (P2)*

The findings identified that participants needed to **be organised** in order to access material in class, or to complete independent study:

*“... when preparing for exams, or any kind of assessment, I'll write a list of all the topics that need to be covered. I really just tick them off as I go through them really. Find, you know, the topic – either the information that's required for it from the Power Points on Moodle and then find any extra information in the textbooks ... that's really just how I've learned the most.” (P4)*

*“I always read through the notes before lectures. I was always well prepared so I made sure I could participate as much as I could ...” (P1)*

*“I've really tried to learn the anatomy before I've had practicals ... if I know my anatomy it helps especially.” (P3)*

### 6.3. Strategies and adaptations

The findings reported a selection of strategies and adaptations employed by the participants to enable learning such as **being the model**, **individual enablers**, and **extra time**. When learning physiotherapy skills, practical teaching demonstrations are used by lecturers and students are asked to volunteer to act as the model; being a model was an enabling factor in practical learning:

*"My lecturer is fantastic she just picks me as the model ... I find it useful." (P2)*

*".... you can see and feel what the movement of palpation should be like and you can see as you're close, watching." (P3)*

*"Yeah, I think if it happens to me it does sink in a bit more." (P4)*

Being the model also enabled the integration of theory and practice and provided feedback to Participant 4:

*"I always need to have a good knowledge before in my head .... having a demonstration on me or just practising on someone I know to check it's correct." (P4)*

It was very clear that all participants had learnt a lot of effective, but **individual enablers**, ways of learning that overcame any barriers experienced because of their visual impairment. For participant 1, it was important that she had the structure and content of a lecture in an accessible version, e.g. not PowerPoint or PDF which she found difficult to access:

*"Having stuff in word made it readable, then I knew the general structure of the lecture and the handouts they were going to give so that I could get the most out of my learning experience at university .... I just wanted to make sure I got the best out of it." (P1)*

She also found that tactile alternatives to pictures in lectures could enable learning:

*"... she taught about muscle fibres ... .. with a bundle of straws which was a great way of learning it for me!" (P1)*

For participant 2 developing audible methods to access the curriculum were his individual enablers:

*"In class I know what to concentrate on, and then I collect all the material from books and record what I need. I listen to it, so I have a basis for what I need to learn and when I go over it again, listening again makes it stay there better!" (P2)*

He also identified specific software that suited his way of learning:

*"I tried Clara-read, it can read most electronic material and websites and some PDFs .... I could also practice the software I had, that can read for me and another that I could talk into the computer, and it prints it out for me!" (P2)*

Participant 3 was very aware of how he learnt, and the possible barriers in the classroom:

*"In my head I can visualise where everything is and that helps, I do find that sometimes I have to ask my lecturer to help me distinguish something ... I find sometimes when they demonstrate you can't always see, like in the hand, it's very small and quite hard to tell exactly what they're doing, so I have to ask and get someone to show me exactly where their hands were when they showed us." (P3)*

Participant 4 was very aware of his own learning style and the enablers that worked for him as an individual, including using his memory:

*"We are encouraged to make notes, but I don't ... even if you don't look at it from a visual impairment point of view, I don't really learn from my own notes. I like learning from textbooks and that's how I usually learn."*

(P4)

*"Something that I always like doing is improvising, and just having a lot of the information in my head and just like – kind of just like reminders on a slide and summaries." (P4)*

Rote learning as a learning strategy was also identified by participant 1:

*"I found a brilliant website that has all the muscles and the origins and insertion and nerves so if I ever forget a muscle I go and check it! My support worker would dictate, and I would rote learn them and if I had any difficulty, I would get her to describe it to me." (P1)*

An enabling strategy for all participants was the provision of **extra time**, provided as a reasonable adjustment (OPSI 2010). However, although extra time was given, being self-aware enabled learning through choice and experience of successful strategies:

*"I have 50% extra time and I have an enlarged paper and I have typing but I find it quicker to write it." (P4)*

Although extra time was frequently provided in written exams, extra time was not always necessary in assessments such as in practical exams. Again, the importance of individual enablers was important in this instance:

*"I usually have an extra minute cos the only thing I need in practical exams is time to read the scenario at the start and sometimes analysing some movements that I have to look at more than someone else would." (P3)*

## 7. Discussion

These findings have shown that for the four participants in this study, whilst barriers to learning in the university setting did exist, there were also many enabling factors for learning in physiotherapy. In fact, a positive and unexpected finding was the clear identification of enabling factors and good practice, which has been less apparent in the literature about disability and visual impairment. Despite being praised for its history of educating visually impaired physiotherapists (WCPT 2016), the UK physiotherapy profession has been criticised for its progress in inclusion (Nicholls 2016); the WCPT (2016 p.15) stated that the profession needed to make 'considerable efforts' to become more inclusive. It is hoped that some of the findings in this study will contribute to this.

However, despite disclosure and provision of reasonable adjustments, there were clear barriers to learning for all of the participants in this study. Interestingly, the provision of support was not the issue with most of the participants; they did on the whole receive support through reasonable adjustments to access the curriculum. However, *how* and *when* the support was provided created the barriers to learning. Support was not always anticipatory, and was reactive, which led to inconsistency in support practices suggesting that they were not usual, were possibly new, and were not routine for staff. In terms of the barriers, the themes were *interdependent*; unsupportive behaviours, poor attitudes and lack of insight into students' needs affected the timely and consistent provision of accessible resources for example, which compounded the lack of individualised support for each student. This reflects the findings of Bishop and Rhind (2011 p.194) whose explorations of visually impaired students in HE concluded that a "one size fits all" approach for an "inherently diverse body of students" was not appropriate.

This study's findings exposed an inability to provide individualised support, which was reiterated by unsupportive behaviours demonstrated by staff, limiting participation in learning in the classroom. Some teaching methods were aimed at the sighted majority, which is understandable; however, having a single student with an individual support need that was forgotten, created a significant impact on the

student's ability to learn. Again, considering the majority's needs is not surprising, but the impact on individual students was significant.

Factors within the learning environment were highlighted such as lighting, and accessing the library, supporting barriers found by the visually impaired students in the work of Bishop and Rhind (2011) and Reed and Curtis (2012). Using a whiteboard at the front of the class was another example, without considering what would happen to the material on it if the students had not been able to see it or note it down. Although one of the participants took photographs, and another went down to the board at the end of class to copy down what was written, these situations affected learning, requiring extra effort. Vickerman and Blundell (2010 p.28) suggested that where students found teaching restrictive, it was due to "a lack of modification of teaching by tutors" (or reasonable adjustments) due to lack of discussion with individual students. In this study, the participants were the only visually impaired students on their courses which could explain the staff's lack of awareness of the problems and inconsistent support. Unsupportive behaviours therefore may be compounded by lack of awareness or empathy as teaching was provided based on the premise that all students could see. These behaviours or assumptions support the findings of Reed and Curtis (2012) and Bishop and Rhind (2011) who identified reliance on visual methods, and Ryan (2011) who identified that poor attitudes of nursing staff contributed to barriers in learning for student nurses.

There were striking links between themes, creating a greater and shared impact on the student. Unsupportive behaviours also impacted on the increased amount of time and effort that the participants put into their studies, and into accessing the curriculum in the classroom. The participants had to chase up and request additional support, even though they had all disclosed and had identified their support needs. Some of the participants just 'coped' and addressed their barriers independently after class, through extra study or accessing other sources. Accessing and reading learning material took greater time, and some material was inaccessible or limited. This reflected previous research that considered students in one institution; participants had to work harder, longer and be strategic with their time (Frank et al., 2014). This was also described by Hanafin et al. (2007 p.442) whose participants had to be "assertive beyond what is called for in normal student life", which has since been supported by Roberts (2009). However, where support was reactive or absent, the student faced greater barriers and found their experiences of learning frustrating and time-consuming. Despite reasonable adjustments, more effort was required to gain the same curricular access; barriers were not always removed by reasonable adjustments, but were partially addressed, further impacting on the student in terms of time and effort. However, a recent paper by Newman and Madaus (2015) suggested that students in HE have to *proactively seek out* support, compared to being at school, which may create a barrier in itself. A lack of insight or awareness by physiotherapy staff could have contributed to the unsupportive behaviours identified in some cases, possibly due to staff awareness and inadequate training when teaching disabled students. This may lead to inconsistency and misguided teaching methods that impact negatively on the students experience but which the lecturer may be unaware of.

Despite the existence of barriers to learning in physiotherapy education, there were many very positive factors identified that enabled learning. The enabling factors were, like the barriers, interdependent. Interestingly they almost mirrored the barriers, suggesting that by addressing the barriers, learning could be enabled. It was clear that for learning to be enabled, the student needed to have good communication skills to openly share their needs and work closely with staff, their peers and support workers for example. The participants' attributes were important in the development of partnership in learning, echoing the findings of Bishop and Rhind (2011) and Reed and Curtis (2012). These attributes enabled them to work together with their peers and their lecturers to access support and participate in learning; they were confident to ask for help, and to establish friendships with their peers

who they worked together closely with. Where the participants communicated well, were proactive and well organised, their learning was optimised. Working closely with lecturers who were approachable to facilitate open and shared support, to provide and develop strategies and adaptations in the learning environment to optimise participation, supporting Ashcroft et al. (2008). There was evidence of compassion and interest in the students, and a clear desire to ensure that they could participate in class in an accessible way. As the lecturing staff were physiotherapists, it should not have been surprising that there were positive attitudes to students and their learning needs, supporting Magnus and Tøssebro (2014) who suggested that attitudes and provision of support were interconnected.

Although previous authors such as Magnus and Tøssebro (2014) and Riddell and Weedon (2014) identified that their participants were cautious about disclosing, and that their identity may have created barriers for gaining support, this was not the case in this study, due in part to the professional nature of the course. Bishop and Rhind (2011) also suggested that visually impaired students needed to have strong and positive self-identity and a willingness to engage to ensure participation.

In order to ensure that support was available, the participants needed to be well organised to think ahead as to what a barrier in class would be and how they would be able to address it. Strategies and adaptations with specific resources to meet individual needs (such as large font or prior access to resources on their institutional virtual learning environment) enabled access to the curriculum (Bishop and Rhind, 2011). However, much of physiotherapy education is skill-based, and it was clear that the participants learned best by being the model in practical classes. Again, this finding cannot be considered alone as being a model in class requires individual self-awareness and confidence, to push themselves forward. One participant joked that he "got good at using his elbows!" (P2). Enabling learning also relied upon the staff being open to using the student as the model; in fact, some staff purposely chose the participants to demonstrate on. The participants all found being a model useful, for reasons of proximity and so that they could feel what was being taught, supporting Owen-Hutchinson et al. (1998 p.256 & 257).

As suggested above, individual strategies to enable learning relied on the participants being self-aware and organised enough to put these strategies in place. There was a clear feeling of learning by doing, and having a go at finding out what helped, showing that these participants were resourceful and proactive; excellent attributes for future physiotherapists. However, it was also ironic that these strategies took extra time and effort, impacting on their experience and participation in university. However, where extra time was *provided* as a reasonable adjustment, and support given to access learning materials, learning was again enabled, and participation ensured. Recently, Lourens and Swartz (2016) reiterated the impact of time on visually impaired students' learning in HE, suggesting that things may still not have improved. In some ways, the success and achievement of the participants in this study was impressive, especially as the literature suggests that having a disability in HE is hard, and that students experience additional pressures (Hannam-Swain, 2018) and even a 'double burden' (Beauchamp-Pryor, 2012 p.292) compared to other students.

### 7.1. Developing approaches to inclusion

Whilst it appears that barriers in the university classroom exist, the responsibility to make reasonable adjustments has been devolved to staff, suggesting that institutional barriers to inclusion will remain until *approaches* to learning and teaching are fully inclusive (Department for Education, 2017). There appears to be a gap between legislation, policy, staff development and student experience; when a student is unique within a cohort the legal duty to provide support is dependent on knowledge and awareness of the issues that the student may face, which staff may not have insight of, leaving the responsibility squarely

with the student. The additional time and effort required by the student to gain access to participation is fundamentally contrary to the policy of inclusion. It is therefore, ironically, possible that barriers and enablers may also exist, in parallel, for academic staff who may not have the knowledge, skills or ability to support visually impaired students in the classroom. To enable learning, academic staff must acknowledge that they too are learning, with an openness to doing things differently (Gibson 2015).

So although it is essential to be aware of individual students' needs (Reed and Curtis, 2012), and to make reasonable adjustments to ensure that students are not disadvantaged, there is another view. Perhaps physiotherapy (and other healthcare) educators could implement inclusive approaches that enable *all* students to access learning, therefore removing disadvantage for individuals (Department for Education, 2017)? It is an interesting paradox that by offering individualising support but then failing to provide reasonable adjustments, the student becomes more disadvantaged. This then results in a greater effort by the same student to enable their own access to learning, reinforcing the "burden" on disabled students in accessing learning (Goode, 2007). It is also possible that some staff were concerned about *advantaging* a disabled student through anticipatory provision, suggested by Riddell and Weedon (2014). This source is now dated but still raises an important point; where reasonable adjustments are focused on an individual, rather than considering inclusive education for all, it is possible that disabled students may continue to be disadvantaged. The earlier issue of staff awareness and training may also compound the issue of accessibility in the absence of an inclusive philosophy for all, rather than reliance of individual reasonable adjustments in the classroom which are not guaranteed (Dept for Education, 2017).

## 7.2. Working together

The key to a philosophy of inclusion appears to be collaboration (Gov.UK, 2017); best practice requires valued engagement between educators and students (Universal Design for Learning Europe 2016). An optimal level of support for individual students can only be ensured where there is willingness and adequate preparation and support from academic and practice physiotherapy educators; there must be collaborative dedication to enable learning in all settings. The need for greater work to support staff to enable learning through 'empowerment of learners' has been recognised by the government (Gov.UK, 2017 p.11); viewing the student as the expert in their specific impairment is one way forward. Empowering visually impaired students will result in empowered professionals, better prepared to develop their careers, and to safeguard the profession.

## 8. Conclusion

These findings show the existence of both barriers to and enablers for learning physiotherapy within the university setting. The barriers prevented students from fully participating and accessing the curriculum effectively, despite support and reasonable adjustments being put in place. However, there were some excellent practices that ensured participation and access to the curriculum in both theoretical and practical teaching and learning, reinforced by strong "human" and compassionate support.

These findings support previous research into the experiences of disabled and visually impaired students in university, suggesting that physiotherapy education is not unique. Despite the physiotherapy profession being open and supportive of visually impaired therapists, there are still barriers that ultimately result in students having to work harder and longer to access the curriculum to achieve their educational goals. However, if barriers can be identified and addressed through open, collaborative relationships and reasonable adjustments, access to the curriculum can be enabled, and full participation in physiotherapy education can be achieved.

## Conflicts of interest

There are no conflicts of interest.

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## Ethical approval details (if applicable)

Ethical approval was gained from the School of Education Ethics Committee, University of Birmingham as part of Doctoral studies 2008–2017.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.nepr.2019.102620>.

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