

A Literature Review of Universal Design for Learning

Dr Frances Maguire and Professor Richard Hall

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UDL Literature Review

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1. Introduction

This literature review is comprised of four sections:

- 1) A focus on Universal Design for Learning (UDL), examining the existing literature and key issues in the field.
- 2) An exploration of how UDL fits with wider pedagogical research on inclusive education and highlights resources published by the Higher Education Academy and other organisations to facilitate and advance inclusive teaching and learning in universities.
- 3) An examination of the context in which UDL was adopted at DMU, with reference to the withdrawal of Disability Students' Allowance. It gives an overview of previous projects at the University that precipitated the institution-wide adoption of UDL including the Disability Enhancement Programme and a related TIP project. This incorporates emerging literature about lecture capture technology.
- 4) The final section maps the broader higher education landscape in the UK considering the adoption of UDL in the context of the Teaching Excellence Framework (TEF), tuition fees and widening participation.

The concluding discussion draws together key themes from each section to highlight gaps in existing literature and the position of UDL at DMU.

2. Universal Design for Learning

2.1 What is UDL?

UDL is a pedagogical framework that aims to provide an equal and inclusive learning experience for students and cater for difference of learning styles amongst them. It is centred on three core principles.

- 1- Multiple means of representation
 - 2- Multiple means of expression
 - 3- Multiple means of engagement
- (Meyer, Rose and Gordon, 2014)

UDL is based on neurological understanding of the needs of individual learners (Rose *et al* 2006). It emerged out of Universal Design (UD) principles that are well established in the field of architecture. UD is based around designing buildings, products and so forth that can be readily used and accessed by the widest possible range of users. It 'focuses on eliminating barriers through initial designs that consider the needs of diverse people, rather than overcoming barriers later in individual adaptation' (Rose *et al*, 2006, p.136). There are a variety of related and overlapping terms used to refer to universal design in educational settings. These include Universal Design for Learning (UDL), Universal Instructional Design (UID) and Universal Design for Instruction (UDI).

UDL as a pedagogic framework emerged in the 1990s out of The Centre for Applied Special Technology (CAST) in America. UDL is defined by CAST as:

'A framework for designing curriculum that enables all individuals to gain knowledge, skills and enthusiasm for learning. UDL provides rich supports for learning and reduces barriers to curriculum while maintaining high achievement standards for all (CAST, 2009)

A recent book by the key proponents of UDL, Anna Meyer, David Rose and David Gordon gives a comprehensive overview of its principles and includes detailed case studies (Meyer, A, Rose, D.H & Gordon, D, 2014). As will be discussed in greater detail in the next section, the initial purpose of UDL was to enhance the learning of students with disabilities; however it is now advanced as effective pedagogical practice for all students.

There are a number of key websites that provide resources for the implementation of UDL in educational settings.

- The US-based National Centre for UDL, which is run out of CAST, has a dedicated website that provides a range of resources and learning tools to implement UDL. Whilst the majority of this (as with most work on UDL) is aimed at school-age students there is a section on this site about UDL in post-secondary education.
- There is a dedicated website to UDL in post-secondary education, *UDL on Campus* (<http://udloncampus.cast.org>). This gives a comprehensive overview of HEIs in America that have adopted principles of UDL, with case studies and links to relevant institutions. The site also provides information on course design including learning goals, the application of UDL principles to learning activities and assessment measures, as well as an overview of technology and digital media that can be utilised to give learners more choice. Therefore, this website has the express aim of providing guidance to embed UDL principles into all aspects of teaching and learning.
- The UDL Implementation and Research Network (www.udl-irn.org) 'supports and promotes the identification and development of models, tool, research and practices designed to foster effective UDL implementation in educational environments.' This includes networking events, conferences and webinars. The website also has a searchable research database of relevant literature and there is a Research Core Committee affiliated to the Network which intends to produce further research.
- Universal Design for Learning: License to Learn (UDLL) was a European project funded by Erasmus+ that examined how UDL could enhance student learning. The main output of this project was the guide *Universal Design for Learning: A Best Practice Guideline* (UDLL, 2016). This gives seven guidelines for implementing UDL in Higher Education, which were based on focus groups held with students and staff. The website for the project also provides a comprehensive list of relevant publications and a student toolkit (www.udll.eu).
- The University of Washington, under the lead of Sheryl Burgstahler and her associates have developed the *Project DO-IT Model* website, which focuses on universal design to increase access to post-secondary education for students with

disabilities. This includes *Universal Design in Higher Education: Promising Practices*, a publication which provides case studies of best practice (Burgstahler eds., 2015). Therefore, this project focuses on the implementation of UD rather UDL into educational settings. UD refers more broadly to accessible design of classroom, campuses etc. to enable learning, whereas UDL relates to curriculum design and teaching that provides accessibility to all students.

Having outlined the available resources it is now necessary to turn to the academic studies of UDL that have been conducted.

2.2 Studies of UDL

Given the fact that there are over 800 different research studies about UDL it was not feasible to conduct an overview of all available literature. Instead, it was decided to concentrate on studies of UDL that focused on post-secondary education, in addition to some literature that considers the wider concept of UDL as pedagogy. The following discussion will identify key themes from this literature. The weight of evidence from this literature will then be analysed, including a discussion of the methodological shortcomings and continuing gaps in knowledge before highlighting where further research is needed in the field, particularly in relation to the adoption of UDL at DMU.

Several studies of UDL have considered the impact of this pedagogy on both staff and students (Kumar and Wideman, 2014; Rose *et al* 2006; Smith, 2012). Studies that focus on students specifically concentrate on the effect UDL techniques had on student engagement with the course and in turn their satisfaction (McGuire-Schwarz & Arndt, 2007; McGuire & Scott, 2006; Watchorn *et al*, 2013; Dean, Lee-Post & Hopke, 2016). These studies used qualitative methods, principally questionnaires, focus groups and interviews, and tend to be small in scale. Only a few examine the impact on attainment in addition to this (Burgstahler and Moore 2015; Dean, Lee-Post & Hopke, 2016). Indeed, scholars note the difficulty of measuring the impact of UDL on attainment because of the other variables that can have a bearing on result (Canter *et al* 2007). Essentially, it is hard to attribute a rise in attainment specifically to UDL techniques, rather than other factors such as characteristics of the cohort, particularly if the studies are without control groups.

Staff-centred studies concentrate on the impact of training in UDL for teaching practice. The extent of training given to staff varied within the studies ranging from the effect of a one-hour training session (Spooner *et al*, 2007) to short courses and online training packages (Zhang 2005; Shelly, Davis & Spooner, 2011; Shelly, Davis & Spooner, 2013; Izzo, Murray & Novak, 2008). Some studies examined tailored support given to select staff on course redesign (Buckland-Parker, 2012; Parker, Robinson & Hannafin, 2007-08). Again the methodological underpinning of these studies are qualitative, centring on questionnaires, focus groups and interviews to gauge how staff engaged with the training and the effect it had on their teaching practice. Izzo, Murray and Novak (2008), observed that even when faculty did not know UDL nomenclature, they had an awareness of what multiple instruction methods were even if they struggled to implement them. This speaks to the overlap between UDL and a broader understanding of inclusive learning that will be discussed in the next section. These examinations of staff also note the limitations of embedding UDL in post-secondary education. Silver (2002), Canter *et al* (2007) and Kumar and Wideman

(2014) highlight that the adoption of UDL can place time pressures on staff, increasing work load whether in the redesign of course and materials and also in instances where more feedback and marking is required in order to provide the flexibility of UDL. Therefore, whilst there is an acceptance that UDL is good practice, it is acknowledged that adequate time and funds are required to make the adoption and embedding of UDL tenable.

Together these studies present a number of pertinent themes for discussion. The studies establish that employing UDL is broadly positive for staff and students. From a pedagogical perspective, students express greater engagement with their courses. For example, Kumar and Wideman's (2014) analysis of first year health sciences course highlighted that students interacted with each other, course material and the tutor more as a result of the changes made to the course and in addition to this, students felt more in control of their learning. The majority of students surveyed in various studies declared a preference for the increased choice and flexibility UDL provided (Watchorn *et al*/2013; Smith, 2012; Rose *et al*/2006). What remains problematic, as acknowledged in the scholarship, is identifying the specific UDL strategies that were the most effective for achieving these outcomes. Studies tend to measure the overall satisfaction of students rather than drilling down into the pedagogy and its subcomponents that have been of particular benefit such as course design, delivery, assessment and feedback. For example, Burgstahler and Moore (2015) asked staff if they felt UDL training had an impact on their teaching, but did not ask them which specific methods they had employed. This can be compared with the evaluative methods, such as the Teaching Excellence Framework (TEF) and National Student Survey (NSS), used to measure student satisfaction with teaching in British HE. It would be useful to gain a deeper understanding of how UDL effects staff and student relationships and whether and/or why students feel greater agency.

The literature is mixed on the impact of UDL on different groups of students. Given the emergence of UDL to support students with disabilities several studies focus on the effects on these students (Burgstahler and Moore 2015; McGuire & Scott, 2006; Embry, Parker, McGuire & Scott, 2005; Parker, Robinson & Hannafin 2007-08). Parker, Robinson & Hannafin (2007-08) and McGuire & Scott (2006) found disabled students responded positively to course modifications, whilst Kumar & Wideman (2014) noted a reduced need for intervention by campus disability services due to the uptake of UDL methods. Training for staff teaching students with disabilities also found it to be effective for meeting needs with an emphasis placed on the increased confidence of staff (Izzo, Murray and Novak, 2008; Spooner *et al*, 2007). Burgstahler and Moore (2015) found that training improved the outcomes of students with disabilities, although outcomes stayed the same for students without disabilities. This contrasts with other studies already discussed that emphasise the positive effects on an entire class (Kumar and Wideman, 2014). This underlines the need for further work on the impact of UDL on particular groups of students. Indeed, there needs to be more investigation of how UDL affects the learning of people with different types of disability. The aim of UDL is to cater for all students, but we need further research to consider if it has a greater impact on some students over others. For instance, it is unclear if UDL has a greater impact on the learning of students with dyslexia than students with a hearing impairment. Examining the potential differences between groups of students as a

result of UDL would give a more thorough understanding of the capacity of UDL to cater to a diversity of students.

The need for greater differentiation between students in future studies goes beyond ability/disability. The need to consider the impact of UDL for students of varying age, gender, and ethnicity is highlighted in existing discussion of this pedagogy (Capp, 2017; Smith, 2012). Dean, Lee-Post and Hapke (2016) examine UDL in a large lecture class of over six hundred students measuring both perceived and actual learning. They do consider diversity in terms of gender, ethnicity and GPA, examining the uptake of learning tools (PowerPoint, lecture notes, clicker and MindTap) within these groups and resulting outcomes. Crucially, this study finds a discrepancy in perceived impact and actual outcomes amongst these different groups. Students with lower GPA's and women perceived a higher level of learning when using these tools, however the attainment data revealed that actual learning was achieved by students with a higher GPA. They also found no impact on gender. From these results they argue for the importance of using appropriate measures to reach diverse student audience, which reinforces the ongoing need for studies of UDL to evidence the effect of such measures.

The studies demonstrate a varied use of technology, which reflects the controversial place of technology in wider discussions of UDL. In addition to pointing out the lack of proof to match the theoretical underpinnings of UDL, reviews of literature also raise the problematic association with UDL and technology (Edyburn, 2010; Capp, 2017, Roberts, 2011). There is a danger of reducing UDL simply to the relevant technology used to support learning (Izzo, 2012) and scholars also point to the lack of research in the use of technologies that align to UDL (Roberts, 2011). For example, the principle focus for Dean, Lee-Post and Hapke (2016) is to gauge which technology tools are most effective for learning, whilst others examine student engagement with online content (Parker, Robinson & Hannafin 2007-08; Watchorn *et al*, 2013). Importantly, these studies do detail the shortcomings of technology. For instance, Watchorn *et al* (2013) note students found real-life role-play of student and patient scenarios better than virtual simulation on an occupational therapy course. This provides a pertinent example of the ways in which the installation of technology could in fact have a negative impact on learning. The studies also demonstrate the use of technology to provide training for staff. In response to a survey of staff, Izzo, Murray and Novak (2008) developed an online training programme on UDL, which received positive feedback from staff. Therefore, a greater distinction is needed between technology as a training tool for learning about UDL and as a means to deliver UDL.

2.3 Methodological Discussion

As previously noted, there are far fewer studies of UDL in post-secondary education and this has been acknowledged as an ongoing issue in the literature (Smith, 2012, p.35). Moreover, the existing studies of UDL in post-secondary education tend to be descriptive in nature and lack rigorous methodology of how to identify the impact of UDL or the evidence that underpins it. Rose *et al* (2006) argued that the research and application of UDL lagged behind its theoretical underpinnings and more than a decade on scholars still flag this as an issue (see also Roberts, 2011; Capp, 2017).

The majority of studies use qualitative methods including questionnaires, focus groups and interviews. These are important for gauging views of both staff and students and identifying perceptions of UDL strategies and their impact on the learning experience. There is less quantitative data related to student performance. Review articles of UDL studies identify this limitation within the literature (Roberts et al, 2011; Rao *et al*, 2014; Mangiatordi and Serenlli, 2013). In their meta-analysis of article abstracts Mangiatordi and Serenlli (2013) found that position and communication papers constituted the majority of literature and were far more numerous than research reports. Roberts *et al* (2011) found only eight existing articles that met their empirical research criteria (six of which were qualitative studies) and argued that there was little existing research to demonstrate that UDL had a positive impact on the attainment and retention of post-secondary students. This lack of evidence is in part due to the difficulty of attributing UDL methods solely to student outcomes as discussed previously. The study of Dean, Lee-Post and Hapke (2016) highlighted the disparity between perceived and actual learning. This underlines the need to combine qualitative research with quantitative data to provide a more rigorous analysis of UDL. In particular, it could help to identify which strategies are most effective and which students benefit from them. This could, in turn, help develop UDL practices to cater for the full diversity of students in higher education. A note of caution should be made at this point. Despite the increasing emphasis placed on student outcomes, particularly by the UK government as a way to measure institutions, it would not be productive to reduce analysis of UDL solely to student outcomes. A value should also be placed on positive learning experiences for all types of students.

One of the weaknesses of the UDL studies discussed is their limited scope. All but one of the studies cited focus on a single class or course. The largest sample group was in the study of Dean, Lee-Post and Hapke (2016), which involved over six hundred first-years; however this was still a single course. This mirrors the flaws in pedagogic research more generally, which tend to be small scale and often focused upon a single course. The consequence of these small scale studies is the limited ability to draw points of commonality and difference within faculties and understand how different groups of students fair under UDL strategies. Watchorn *et al* (2013) compare two different courses, although this hardly addresses the diverse range of courses offered by post-secondary institutions and across disciplinary boundaries more broadly from arts and humanities to science and STEM subjects.

We need to understand the impact of UDL across a spectrum of university courses. Related to this point is the lack of control groups in many of these studies, which is acknowledged in some of these studies as an area to be addressed (Kumar & Wideman, 2014; Smith, 2012). Without a direct comparison with courses that did not incorporate UDL strategies it is hard to substantiate the impact UDL as there is nothing to measure it against. Indeed, Shelly, Davies and Spooner (2013) re-ran their study with a control group and, as a consequence, reinforced their previous study to demonstrate the positive impact of UDL training on staff. Using control groups would be another way to strengthen the research base around UDL. Furthermore, large-scale studies would be helpful to expose intersectional differences, giving a deeper understanding of the effect of UDL strategies on a broader diversity of students in terms of gender, age, ethnicity and disability. The institution-wide adoption of UDL at DMU presents an ideal context in which to conduct a large-scale study.

Perhaps the most striking feature of these studies in the context of DMU's adoption of UDL is that none were conducted in the UK. As review articles on UDL note, the majority of studies took place in the US (Capp, 2017; Mangiatordi and Serenlli, 2013; Al-Azawei, Serenelli and Lundqvist, 2016). There are contextual similarities in terms of the increasing diversity of students entering post-secondary education and the need to find positive solutions to cater to their needs and create a positive student experience. Moreover, UDL's principles which place emphasis on establishing clear learning outcomes, flexibility of learning resources, delivery and assessment are by name 'universal'. Nonetheless, there are inevitable differences between these other educational systems (the majority of which are American) and the British higher education landscape which limits direct comparison that can be drawn from this literature. Factors such as the restrictions on Disability Students' Allowance, increased fees and the Teaching Excellence Framework all create a distinct set of responsibilities on institutions in the UK and shape expectations of students, which demand particular attention in relation to the adoption of UDL at DMU. The widening acknowledgement of UDL as effective pedagogy demands a consideration of how/if it can meet the particular challenges of higher education in the UK.

Some of these themes are raised in broader pedagogical discussions of UDL. Edyburn (2010) highlights the ongoing problem of defining UDL as a concept and these debates are picked up in other review articles of the field (Capp, 2017; Roberts, 2011; Zeff, 2007). Rose *et al* (2006) argued that debates around the concept reflected 'the ongoing developmental nature of UDL'. However, this is yet to fully emerge. In his review of peer-review literature containing a pre- and post-testing methodology between 2013-2016 across all education levels, Capp (2017) again pointed to the need for more empirical research, 'on the action and expression as a means of demonstrating the effectiveness of this teaching methodology at improving education outcomes' (see also Rao *et al*, 2014; Mangiatordi and Serenlli, 2013). Rose and Meyers (2002) pointed to the disconnect between an increasingly diverse student population and a 'one-size-fits-all' curriculum, although doubts have been raised about UDL's capacity to cater for all needs and whether it is feasible that a point would ever be reached where no individual adjustments will need to be made. Edyburn (2010) explains 'special and inclusive education scholars have asserted that modifying and making accommodations to curriculum for students with diverse abilities maintains the status quo'. Just how 'universal' UDL is and can ever be continues to be a key point of debate in the literature.

At an organisational level, there has also been discussion of how UDL can be effectively implemented and maintained in post-secondary institutions. Zeff (2007) examined five UDL initiatives at colleges in America. He noted that in each case Universal Design went from catering for students with disabilities to the wider student body. This gives a sense of the pattern of institutional change, whereby the accommodations made for one group of students come to be seen as beneficial for the rest of the student population. Crucially, Zeff also identified patterns across the institutions in relation to how UDL projects began to wane after their implementation. Typically, UDL initiatives were introduced with ample funding and senior-management buy-in. After this ended, enthusiasm for UDL decreased and in some instances the only remnants were a collection of resources on archived websites. This points up issues with maintaining UDL principles in 'business as usual', without the impetus

of a dedicated project or funding. This is of particular relevance to UDL at DMU moving forward.

3. Inclusive Education

There is a congruence between UDL and broader ideas of inclusive teaching and learning (ITL). Whereas none of the existing studies on UDL have a UK focus, the concept of ITL does have a greater currency in the UK. Indeed, UDL has been cited as a method of enhancing student engagement in recent literature on curriculum design and inclusive learning in higher education in the UK (Bryan, 2015; Warren, 2016) and the Erasmus+ guidelines identify UDL 'as a key concept for creating inclusive learning' (UDLL, 2016). Most universities now have some initiative and/or policy around inclusive teaching and learning. This section will give an overview of the pedagogical underpinnings of ITL, the context of its adoption in Higher Education and then go on to examine the resources provided by organisations such as AdvanceHE and JISC for implementing ITL practices in higher education.

3.1 Inclusive Teaching and Learning

Inclusive teaching and learning centres around learning that is accessible to all students and takes into consideration different learning styles. In an overview of research on inclusive learning in HE Hockings (2010) gave this definition:

'Inclusive learning and teaching in higher education refers to the ways in which pedagogy, curricula and assessment are designed and delivered to engage students in learning that is meaningful relevant and accessible to all. It embraces a view of the individual and individual difference as the source of diversity that can enrich the lives and learning of others.'

This is reflective of contemporary research on effective pedagogy of students in Higher Education which concentrates on 'student-centred' forms of engagement (Gibson 2016). There is confusion in the literature, which at times is unable to disaggregate active learning/co-creation/student-as-producer, from inclusive practice. However, the overlap with UDL is evident and Hocking (2010, p.3) highlights the capacity of both Universal Design and ITL as a means of providing equity and fairness. What pervades in the literature is the assumption that UDL has the same impact on students throughout university. Further work is needed to differentiate between students at different stages of university (e.g Level 4 vs Level 7) in order to gauge how they utilise and respond to UDL as well as the impact it has on their learning throughout their time at university.

Like UDL, the underpinnings of ITL came about as a way of improving the learning experience of students with disabilities, but are now recognised as beneficial for the wider student body. This has not been without criticism. In a similar vein to the criticism levelled at UDL, student-led approaches that target the entire student body have been criticised as unrealistic, 'because of the extent of the diversity which it attempts to respond to' (Haggis, 2006, p.521). Instead, Haggis (2006) points to the need to tackle pedagogical culture in higher education which could be subtly exclusionary. This chimes with other work that calls for the needs to focus on 'the structure, processes and practices within the institution which create barriers to equitable experiences' (Wray 2013, p.5; see also Ahmed, 2012).

Key examples of inclusive learning often cited include 'flipped classroom' in which students are required to view lecture materials in their private study time and engage in active

learning activities during their contact time with tutors. In an analysis of inclusive practice to enhance student learning Bryan (2016, p.23) argues the 'flipped classroom represents a unique combination of learning theories once thought to be incompatible – active, problem-based learning activities founded upon a constructivist ideology... and instructional lectures derived from direct instruction methods founded upon behaviourist principles'(Bryan, 2016, p.28). There is also an emphasis on 'blended learning' which uses both online digital media and traditional classroom methods. Like UDL, there is an emphasis placed on the capacity of technology to deliver inclusivity here.

3.2 Background

The adoption of inclusive practice in UK universities was against a backdrop of the drive to get fifty per cent of young people to go to university in the late 1990s and early 2000s under the New Labour government (Gibson, 2016). The increasing size and diversity of the student population prompted research and emerging policies and practices in higher education around Widening Participation (WP), which will be discussed in further detail in the final section. In this respect, inclusive education was concerned with 'wider access to education for those who have been 'traditionally' excluded due to societal practices, cultures or ways of doing that result in inequality...' (Gibson, 2016). Indeed, tied up within these efforts has been an increasing emphasis placed on improving diversity and equality in higher education and the need to remediate the attainment gap for students from 'traditionally' excluded backgrounds including students with disabilities, BAME groups.

Alongside the increasing diversity of the student population has been the growing calls for staff in HEI's to gain teaching accreditation. This is wrapped up in the notion of ensuring 'professionalisation' in university teaching. The growing expectations of both students and governments that HEI's are accountable includes assurances about the quality of teaching (Hibbert and Semler, 2016). This raises questions about what constitutes professionalism within higher education and how/if this differs from a sense of professional identity both at an institutional, departmental and subject level. As career progression continues to be tied more closely to research output, the greater onus placed on teaching ability stands in contention to conventional roots to promotion and perceptions of 'professional development'. The UK Professional Standards Framework (UKPSF) introduced in 2006 codified by the Higher Education Academy (HEA) and endorsed by Guild HE and Universities UK commits to fostering innovative approaches to teaching and learning. The formation of the HEA was the latest in a long line of teaching enhancement initiatives that had varying levels of success (Kernohan, 2018). The HEA provides formal qualifications through various levels of fellowships that in effect provide a professional development career path from junior lecturer to established staff. Using data from the Higher Education Statistics Agency (HESA) Hibbert and Semler (2016) suggest 26% of university teaching staff have achieved accreditation from the HEA. These courses are not mandatory, although taking a PGCert course or obtaining a HEA fellowship is increasingly a requirement for new academic staff. This rise of accreditation has sparked debates. Some have questioned whether certification automatically translates to better teaching and 'professionalisation', presenting as it does the assumption that this had not been in evidence in universities beforehand. Others point to the fact that informal training and mentoring provided in departments are equally effective

in gaining teaching expertise, concluding that accreditation is simply another box-ticking exercise for HEIs to obtain (Hibbert and Semker, 2016).

3.3 Higher Education Academy

The HEA, which provides training for those teaching and supporting learning in higher education, has produced several publications and resources surrounding inclusive practice that are available for wider use on their website. This demonstrates the extent to which inclusive teaching and learning methods underpin the training provided for those teaching in higher education. In March 2018 the HEA merged with the Equality Challenge Unit, and the Leadership Foundation for Higher Education to form AdvanceHE. It is anticipated the flagship programmes of these organisations will be retained and, therefore, it is likely the teaching fellowship the HEA offer will continue.

HEA publications include resources for embedding inclusive practice in HE teaching and learning, covering design, delivery and feedback (Porter, A 2012; May, H and Felsing, A 2010; Thomas, L and May, H, 2010; Morgan, H and Houghton A-M, 2011; Winstone, N and Nash, R, 2016). In their guide for inclusive curriculum design, Morgan and Houghton (2011, p.12), reinforces that 'effective practice for one group can and should be effective practice for all' and that this 'approach has its foundation in a commitment to promoting equality and diversity.' Indeed, the key principles of their design process (Anticipatory, Flexible, Accountable, Collaborative, Transparent and Equitable) demonstrate the shared vocabulary between inclusive practice and UDL (Morgan and Houghton, 2011, p.12). This entrenches the view that UDL is just good teaching practices. One of the HEA reports gives an overview of inclusive practice projects of 16 higher education institutions in the UK (Wray 2013). The report underlined the difficulties institutions had defining inclusive teaching and learning, which also made the evaluation of the projects at each university challenging. This is just a small selection of the resources available on the HEA website.

3.4 Assistive technology

Although the place of technology in the delivery of inclusive teaching and learning remains a point of contention, the resources available on assistive technologies demand discussion. Some of these technologies have the specific focus of helping students with disabilities, however, in many cases they have been found to have wider applicability. These technologies are less high-value for institutions and educational technology corporations than increasing use of lecture capture discussed below.

Jisc/JISC TechDis

Jisc is the principle provider of advice and support about assistive technologies for higher and further education in the UK. The resources and guides that they produce focus on using technology to support inclusive learning (Jisc, 2014). Although wound down in 2014, JISC TechDis was the leading UK advisory service on technology and inclusion for students and staff with disabilities. Again, the resources produced concentrated on harnessing technology to support inclusive practice and are still available on their archived website. There is also a YouTube collection of resources to accompany the TechDis guides.

Ed-ICT International Network

Ed-ICT is a three-year network funded by the Leverhulme Trust 'to explore the role that ICTs -including computers, assistive technology, online learning – play or could play in causing the disadvantage or removing disadvantage that students with disabilities in post-compulsory education experience...'. This project involves five countries (UK, USA, Canada, Israel and Germany) and the website provides a list of resources and proceedings of conferences and networking events related to the project.

Comments

This section has demonstrated the considerable overlap between UDL and inclusive teaching and learning that has a greater currency in the UK. Inclusive practice is an established part of HE provision both inside universities and organisations involved in providing training for those teaching in higher education. This could be both a help and hindrance in respect to the adoption of UDL. A help, as there is recognition that flexible practice that caters to a diverse study body is now an expectation in HE. A hindrance, because it could be hard to distinguish what is distinctive about UDL and what is just good teaching practice.

4. UDL at DMU

This section will outline the factors behind the adoption of UDL at DMU and its place in the ULTAS. It will explore the withdrawal of Disability Student Allowance which prompted the adoption of UDL at DMU via the Disability Enhancement Programme and, subsequently, a Teaching Innovation Project (TIP). As DMU Replay is a key part of UDL at DMU, the discussion will then move on to explore the emerging literature around lecture capture. The institutional and change management implications of the roll-out of Replay were examined extensively in the report produced by Pettit and Hall (2018).

UDL at DMU is based around the 3 principles of UDL and 6 further ideas.

1. Teachers make learning materials available to students in a modifiable format 48 hours before each teaching session.
2. Self-directed learning is signposted in each teaching session.
3. Students are provided with opportunities for active learning and knowledge checks.
4. Students able to review, replay or revisit teaching sessions in the Virtual Learning Environment.
5. Do modes of assessment provide the opportunity for all students to demonstrate knowledge and understanding?
6. Do module VLE shells meet the DMU Threshold for the use of technologies in the curriculum?

4.1 ULTAS

UDL is one of the three pillars of the new University Learning, Teaching and Assessment Strategy (ULTAS) at DMU that is in place from 2018 to 2023 (DMU, 2018). This strategy states UDL is DMU's 'flagship approach to make learning accessible to all regardless of circumstance' alongside the other two pillars 'co-creation' and 'building capacity'. The strategy outlines the intended benefits of UDL:

KPI

- Reduction in the BAME attainment gap
- Incremental development of programmes supporting flexible, multi-modal and part-time degrees
- Diverse and accessible curricular in all programmes

KPT

- Measurable improvements in non-continuation, module assessment average and Good Honours outcomes in programmes selected for Course Specific Intervention
- #DMUglobal/DMUworks opportunities embedded in every programme of study
- Overall student satisfaction significantly above the NSS benchmark; CLF student satisfaction consistently above 75%; MLF feedback scores consistently above 3.5.

The intention that UDL will reduce the BAME attainment gap demonstrates the overlap of the UDL project at DMU with the Freedom to Achieve project. Whilst UDL is now part of the ULTAS, the principles of UDL were initially adopted as part of the Disability Enhancement Programme (DEP) implemented in 2015 (DMU, 2015).

4.2 Disability Enhancement Programme

The Disability Enhancement Programme at DMU was initiated in response to changes the government made to Disability Students' Allowance (DSA). The government placed greater onus on universities to provide adequate support for students with disabilities under the 2010 Equalities Act and withdrew DSA from groups of students previously included for support. This was against a backdrop of an increasing proportion of students attending university declaring disabilities. HEIs must now meet the costs of transcription services and non-medical support roles without passing on the cost to students (Crockfield *et al*, 2018).

These changes were presented in line with an inclusive social model of support which takes a social view of disability:-

The social model of disability says that disability is caused by the way society is organised, rather than by a person's impairment or difference. It looks at ways of removing barriers that restrict life choices for disabled people (Scope, 2018)

DMU has a comparatively large population of disabled students and a reputation for leading the sector in its provision for students with disabilities. The stated outputs for DEP were:

- Developing measures to ensure accessibility for all students to all learning and teaching activities within the university;
- The development of a DMU disability assessment centre;
- Reviewing specialist accommodation provision;
- Increased availability of lecture-capture technology across the university;
- Extending the provision of accessible software;
- Widening the use of multimedia as an enhancement to teaching and learning resources;
- Enhancing digital access to published academic content;
- Providing relevant staff and student training and development opportunities (DMU, 2015).

The first bullet point demonstrates the context in which UDL was adopted, in order to provide inclusive teaching and learning. DEP ensured DMU's continued position as a sector-leader in its provision for students with disabilities. The programme was a runner-up at the Guardian University awards 2017 in the category of student diversity and widening participation.

The changes made to DSA prompted the production of publications to advise and help HEI's to meet the new requirements. The Office of the Independent Adjudicator, which considers student complaints made against HEIs released *Good Practice Framework: Supporting*

Disabled Students (OIA, 2017). This guidance will inform how the organisation considers complaints relating to disability from the 2018/19 academic year.

Moreover, DMU's approach and its adoption of UDL has been cited in several publications as evidence of good practice in response to these changes. DMU was a case study in the Department of Education (DfE) publication, *Inclusive Teaching and Learning in Higher Education as a Route to Excellence* (DfE, 2017). This report was produced for DfE by the Disabled Students Sector Leadership Group to provide guidance for HEIs to make the 'reasonable adjustments' now necessary under the Equality Act 2010. The case study of DMU outlined the audit of programme and module validation documents taken to ensure UDL principles were in place in relation to teaching, learning and assessment as well as the audit undertaken of Professional Statutory Regulation Bodies requirements to overcome any barriers to UDL and DMU Replay (DfE, 2017, p.34).

Although defunct as of March 2018, the Higher Education Funding Council for England (HEFCE) commissioned a report, *Models of Support for Students* (Williams *et al* 2017), which examined the support provided by HEIs for disabled students. This comprised of an online survey of 137 providers and in-depth case studies with 13 providers. This also included a discussion of DMU's UDL policy. The report commended its recognition of 'the complexity of the change and thus the time required for planning, preparing and implementing change across the institution' and also cited the use of UDL champions to 'support the institutional agenda and provide assistance for individuals' (Williams *et al*, 2017, p.65). The report also discusses DMU's lecture capture provision as part of its commitment to UDL (Williams *et al*, 2017, p.70). It is notable that these external reports tend to reduce UDL at DMU to the role of champions and technology, rather than an overarching philosophy, pedagogy or enhancement. This is resonant of the fact that organisations such as the Office for Students (which has now replaced HEFCE) tend to discuss teaching and learning initiatives like UDL primarily in terms of quality assurance rather than quality enhancement.

4.3 TIP Scheme

The TIP scheme entitled, 'Towards Equitable Engagement: the Impact of UDL on Student Perceptions of Learning' examined the perceptions and feelings of Level 4 students about UDL strategies on their engagement with and experience of Higher Education. The aim was to engage students from each Faculty and from a wide range of backgrounds to understand whether there are differential impacts of UDL. It also sought to evaluate how the six UDL ideas and three UDL principles are interpreted and applied by students. The intended outputs of this project include the production of a REF-able journal article focused on participative action research and pedagogic research, which will deepen engagement with UDL and build DMU's reputation in this field.

The headlines from the project noted the mixed success of engaging students and suggests students' 'perceptions of its appropriateness as a learning and teaching framework are naturally going to be constrained by their own limited appreciation of other's learning styles'. They found no difference in perception of UDL by those with declared learning differences and those without.

Initial findings produced from the TIP scheme highlighted some key issues.

- Firstly, a much wider qualitative survey was recommended in order to ascertain if the implementation of UDL had helped to recruit and retain students with a wide range of learning styles.
- Secondly, it argued that UDL as an institutional set of heuristics needs to be adapted locally, at the module and programme-level, in order that it appropriately represents the dedicated learning support that some students require.
- Third, it argued that any future evaluation strategy should be co-created through participative action research with students.

4.4 DMU Replay

Given the significant investment in DMU Replay as part of the provision of UDL at DMU and the broader adoption of lecture capture technology in higher education, it is necessary at this juncture to consider the emerging literature on this topic. The lecture capture system DMU Replay has been a key part of the university's UDL framework. Originally, it was intended that all staff-led activities would capture content for students by 2018/19. The changes proved so popular amongst students that Replay was rolled out to all students in the 2017/18 academic year. Lecture capture technology is becoming increasingly widespread in universities and DMU has one of the most comprehensive policies in its expectation that all staff-led activities are recorded. This section will examine the emerging literature around lecture capture and engage with debates about its impact on attainment and attendance. It will then discuss the impact of lecture capture on staff, including issues raised by various University and College Union (UCU) branches.

Attendance

A key issue surrounding lecture capture is the contention that it has a negative impact on student attendance to lectures. Some scholars assert that if content is recorded students will have no impetus to attend the lecture. The literature remains mixed on this issue. A recent study by Nordmann and McGeorge (2018) argued that there was 'no systematic evidence to suggest that access to recordings alone significantly impact attendance'. Conversely, Edwards and Clinton (2018) demonstrated a negative impact on attendance and a resulting negative impact on attainment. Their study examined a compulsory second year research methods module using data from two matched cohorts, one with lecture capture and the other without. It found that only in a minority of the cohort did lecture capture negate low attendance and instead 'attainment showed a significant positive relationship with attainment' (Edwards and Clinton, 2018). Essentially, attendance has more impact on attainment and the availability of lecture capture jeopardises this.

These contrasting findings on the impact of lecture capture on attendance suggest a lack of systematic evidence, which is unsurprising in light of other pedagogic innovations and the difficulty in unpacking impact on its constituent elements. As lecture capture looks set to become a fixture in higher education, Edwards and Clinton (2018) argue that lectures need to be made more interactive to ensure attendance and make them substantially different from what students would get from lecture capture alone. It needs to be clearly communicated and demonstrated that lecture capture alone will not ensure a good grade. The issue appears to be the equation of the recording with the lecture itself, instead of a

separate learning resource, which demands a consideration of the pedagogical issues around lecture capture.

Pedagogy

One study was found that examined whether lecture capture supported UDL principles. Watt *et al* (2014) analysed the introduction of lecture capture for a course within the faculty of Social Science at a Canadian university. A mixed methods approach of a questionnaire and interviews were held with students and the findings 'indicate that lecture capturing may address multiple principles of UID from a single student's perspective'(p.10). The study argues that lecture capture supports UDL principles and found that a large percentage of the cohort engaged with lecture capture to improve their knowledge and understanding. However, the study highlighted the need for further research focusing on students with reported academic accommodations to ascertain if lecture capture has the same impact on different groups of students.

Nordmann and McGeorge (2018) argue that 'there has been less attention on how to maximise the pedagogic value of lecture recordings', although they note that 'for the majority of students the greatest value of recordings is as a learning resource'. Again studies find both positive and negative pedagogic value to lecture capture. Nordmann and McGeorge's study is mixed about improved levels of attainment across all levels, suggesting it works for certain groups of students more than others. In response to these findings they highlight the need for interventions to show students how to effectively use lecture capture to promote deep learning rather than as a replacement for lecture attendance.

Students reflect positively on the impact of lecture capture on their learning experience. Hall and Ivaldi (2017) took a qualitative approach to examine students' experience of lecture capture via six focus groups engaging with a total of 42 students. Thematic analysis revealed two themes: enhancing the learning environment and working and learning strategically. They found that students recognised lecture capture as a separate learning event to the related lecture, which remained the primary learning event. Instead, the students used lecture capture to reinforce understanding of topics discussed in the lecture and clarify complex information (Bongey *et al.*, 2006; McKinney *et al.*, 2009). This suggests lecture capture has a positive impact, alongside lecture attendance. Nonetheless, focusing solely on student views may give an overly optimistic view of how lecture capture technology is used.

Studies do highlight the use of lecture capture as a revision tool. At this juncture it is pertinent to flag the series of video podcasts produced by Malcolm Andrews for a second year module on Pharmaceutical Microbiology at DMU in 2008, which he evaluated via a series of questionnaires and focus groups with his students. These podcasts were typically around ten minutes long and introduced students to a key topic before the weekly lecture and were also used for revision at the end of the course. The evaluation found the podcasts to be well used amongst the students and concluded that the podcasts did not cause a drop in lecture attendance (Andrews, 2008). These results chime with findings in the wider literature. Edwards and Clinton (2018) found that 68% of the class with lecture capture made no significant use of it during term time and, instead found that two thirds of usage

occurred during the revision period. This corresponds with the findings of Elliot and Neal (2016). They used a revealed preference approach over two years to gauge the use of lecture recordings by students in a first-year undergraduate economics module. Their study found extensive use of recordings by students and demonstrated their value as a tool for independent study. There were clear spikes in views in weeks when tests occurred, which shows that recordings were used as a revision tool. The number of viewings increased over time which they suggest reflects 'students' growing recognition of the value of the lecture recordings' (p.158). Moreover, viewing figures demonstrated that students tended to watch parts of the lectures rather than the entire recording and the questionnaire conducted in the study supported the assertion that the recordings were 'a supplement rather than a substitute for lecture attendance'. The study did not gather lecture attendance data or students' test and final examination results. Therefore, there is no evidence of how such usage impact upon attainment. However, if students are not attending as a result of lecture capture and then only engaging with content just before the exam this is undoubtedly liable to prevent a deep understanding of the material being reached.

Indeed, qualitative research conducted with lecturers has exposed concerns that lecture capture may cause the loss of essential learning skills. Bond and Grussendorf (2013) surveyed staff perceptions of lecture capture and noted that staff feared students were losing the ability to take notes effectively, based on the assumption that recordings make note-taking redundant. Furthermore, it is suggested that lecture capture can also affect the performance of staff. Witthaus and Robinson (2015) acknowledge that lecture capture can stimulate interactive teaching approaches such as flipped classroom. Staff views on lecturers will be examined in more detail later, however concerns have been raised that the presence of lecture capture can inhibit the performance of lecturer who self-censor because they are being recorded. Joseph-Richard *et al* (2018) make the pertinent point that whilst the Teaching Excellence Framework (TEF) rewards state of the art technology in higher education, there has been little consideration of whether such technology could in fact make the delivery of teaching blander. This will have an impact on the quality of learning. There appears to have been a widespread adoption of lecture capture without any corresponding training for either staff or students about how it is best utilised or a consideration of how it can be used to ensure quality enhancement.

Who's Watching

There is little evidence about the effect of lecture capture on particular groups of learners. Nordmann *et al* (2017) triangulate user views of recordings with attendance and GPA to see the effect of lecture capture on attainment. They examine the utilisation of lecture recordings across different year groups in the psychology department at Aberdeen University. The study identified 'the greatest benefit of additional recording use is seen in low GPA students with high attendance' which indicates that lecture helps students with lower average marks when used as a supplement to lecture attendance. This, in turn, implies that lecture capture benefits certain groups of students more than others.

Some initial findings have been forwarded about certain groups of learners, although further research is required. Nordmann and McGeorge (2018) show that second language learners demonstrate different patterns of usage, suggesting their use of lecture capture helps to

overcome parts of the lecture that were missed because of unfamiliar language used or lecturers talking too quickly. Meanwhile, Edward and Clinton (2018) found lecture capture to have different effects across gender. Their study showed that the adverse effects of lecture capture on attendance and attainment may affect women more than men, although they were unable to identify why this was the case and recommended that further research is needed to understand this.

Given the adoption of lecture capture at DMU in response to changes to DSA provision, it is frustrating that there is little existing literature about the impact of this technology on students with declared disabilities. The withdrawal of DSA for many students with disabilities has had an impact on the availability of note takers to offer assistance for students with specific learning needs in lectures. Lecture capture has been presented as the alternative and research is needed as to whether this is providing an equitable alternative. Leadbeater, Shuttleworth, Couperthwaite and Nightingale (2013 p.186) found that recorded lecture helped students whose first language is not English, or who had dyslexia to overcome initial linguistic and/or learning difficulties, but noted that it did not directly impact upon attainment.' This demonstrates that further research is needed to examine if lecture capture has adequately overcome the loss of note takers with the withdrawal of DSA, which underpinned the adoption of DMU Replay. More broadly, there needs to be a breakdown of Replay views by various intersections of students to enable a comprehensive analysis of who is watching and engaging with Replay.

Staff Views

Lecture capture is, unsurprisingly, a contentious issue for staff. Bond and Grussendorf (2013) conducted a qualitative study of staff at the London School of Economics to gauge their attitudes via semi-structured interviews. This included staff that had adopted lecture capture and those that had not. This study highlighted four main areas of concern: discomfort of being recorded for posterity; lecture capture adversely effecting attendance at lectures; loss of the essence of the lecture through recording and the loss of learning skills. There was greater acceptance that lecture capture could be used as a form of contingency in the event of illness or adverse weather conditions, but there remains a wider anxiety that lecture capture is changing the way teaching is delivered and consumed in universities. The student as a consumer stands juxtaposed to the notion of the student as co-creator that is central to ideas of inclusive teaching and learning.

Focusing solely on staff that did use lecture capture, Joseph-Richard *et al* (2018) used a survey alongside in-depth interviews to explore the impact of lecture capture on academic practice at a UK university that piloted Panopto in 2015. A small majority of lecturers felt that lecture capture had little impact on the design or planning of their lecture, although it does heighten self-awareness and reflection of staff. One key shift they noted was that lecture capture had 'subdued the informal discourse of the pedagogic relationship by introducing surveillance effects (p.386).' Staff worried that recordings would be used for appraisal and other surveillance measures beyond their intended purpose. Joseph-Richard *et al* (2018) were wholly positive of the effects of lecture for students (without engaging with any) noting that lecturers became more learner orientated and that students were supported by lecture capture as lecturers received fewer email queries from students. This

assumes a pedagogic advantage for students, but does highlight the pertinent concerns that staff continue to have.

Policy

The potential impact of lecture capture on the position of staff at universities has prompted the involvement of unions and calls for clear policies on the purpose of recordings. Clear policies are needed in regards to copyright over recorded material and whether it will be used in staff appraisals. It is down to individual universities to produce policies about lecture capture in their institutions. As a consequence, there are myriad of opt-in and opt-out policies, which have left many staff unsure of where they stand (Nordmann, 2018; Nordmann and McGeorge, 2018). Jisc (2010) also produced copyright guidance on lecture capture, although this is not necessarily adopted in universities.

The University College Union (UCU) continues to raise issues surrounding lecture capture, no doubt in response to the varied policies in place. Motions carried at the 2016 annual UCU convention called on members and branches to issue clear policy guidelines so lecture capture is 'not used to replace people or as a performative object'. These concerns were exacerbated during the USS strike in 2018 by university staff, during which Edinburgh University proposed using recordings to substitute lost lectures. At the most recent UCU convention, Nottingham Trent University and Edge Hill issued a motion over concerns that universities were ignoring their own guidelines and those which JISC has issued. The motion that carried stated a preference for opt-in policies and more stringent policies to protect staff during industrial action, as well as casual staff whose workload is unduly affected by requirements for uploading recordings etc. This issue is not resolved and demonstrates another consequence of imposing lecture capture technology without fully considering the impact on staff. In their report on the roll-out of Replay at DMU, Pettit and Hall (2018, p.1) argue that 'a blend of different approaches to change management, project management and stakeholder engagement is required to effect sustained institutional change.'

Discussion

Lecture capture is a technology that looks set to become a fixture in Higher Education (if it is not already), although there remain unresolved policy issues that need to be addressed. In regards to research on lecture capture there is a lack of evidence over the pedagogic impact for students. Existing studies have focused on a particular module or departments rather than the institutional role out of this system and only one study considers the capacity of lecture capture to support a UDL framework (Watt *et al*, 2014). This should not infer that lecture capture is consequently of no use, but instead reinforce the need for further research to explore its impact on the diverse student body. Indeed, Hall and Ivaldi (2017) emphasise the need to further examine the impact of lecture capture on retention and widening participation, challenging our assumptions that the main function of lecture capture is as an attainment tool in higher education. Elliott and Neal (2016) call for more research on the potential use of lecture capture as a tool for formative assessment to examine how students can engage with lecture recording beyond simply listening. The evolving role of lecture capture technology in universities will doubtless prompt further studies to grapple with these issues.

5. Higher Education Landscape

This final section will examine DMU's approach in response to the broader landscape of Higher Education and current issues in the sector. Lifting the cap on students in 2015 has increased the numbers attending university, although there remain significant challenges around widening participation and the attainment gap for students from 'non-traditional' university attending backgrounds. This section also examines policy changes including tuition fees and infrastructural changes such as the recent establishment of The Office for Students. These shifts in the sector not only reveal government policy, but the shifting expectations that students hold when at university. It is necessary to consider these in relation to DMU's approach to teaching and learning.

5.1 Fees

Perhaps the biggest shift in higher education in recent years has been its increasing cost for students. Tuition fees trebled from £3,000 in 2006 to £9,000 in 2012. The Sutton Trust has noted that the increase of fees has had a persistent negative impact on the perceptions of university among young people (Cullinane, 2018). Added to this, the government announced in 2015 that non-repayable maintenance grants would be replaced with maintenance loans, which graduates would repay like tuition fee loans. UK students from low-income families were awarded up to £3,387 a year until 2016 and a report by the Institute for Fiscal Studies argued that this group were disproportionately affected by the cuts to maintenance grants (Britton, Crawford and Dearden, 2015). The withdrawal of maintenance grants was highly criticised at the time and there continues to be calls from high profile individuals and organisations, including the IFS, The Sutton Trust, Tim Bradshaw chief executive of the Russell Group, and the House of Lords for the re-introduction of maintenance grants, particularly for students from lower-income backgrounds (Belfield, Britton and Hodge, 2017; The Guardian, 2018; House of Lords, 2018). There are hopes that the current Review of Post-18 Education and Funding, which the government is conducting, could bring about the re-introduction of maintenance grants for those from the poorest backgrounds. Certainly, The Russell Group which is submitting proposals for the evidence call is arguing for this.

The increased financial burden placed on students has prompted much discussion around 'value-for-money'. Since 2006 the Student Academic Experience Survey has asked students whether they feel their studies offer value for money. Results for this measure in the 2018 survey had improved on a 5-year downward trend. Nonetheless, as it stands, just 38% of students in the UK perceive 'good or very good' value for money from their course and the survey highlights the different experience of ethnic minority groups who are more likely to give a lower rating. Value for money remains a controversial measure for education and reinforces the notion of the student as a consumer in higher education. Nonetheless, the establishment of the Office for Students in 2018 and the collection of Longitudinal Education Outcomes (LEO) data looks set to ensure this remains a key benchmark in the assessment of HE provision. LEO data reveals what UK graduates from different courses at different university are earning now, either one, 3 or 5 years since graduating by linking up tax, benefits and student loans data. While this is complex data and has substantial caveats, commentators have noted that it has the potential to be 'used to identify the long-run

individual economic returns to higher education, which can in turn be used to regulate (read: minimise) levels of state subsidy' (Morris, 2017). Indeed, McGettigan (2015) argues that the profusion of performance metrics is symptomatic of the government's urge to instil consumerism into higher education. The Treasury's concern with the size of state subsidy built into the student loan scheme that they are unlikely to recoup, he argues, prompted the government to introduce these metrics in order to 'let the market determine what should be offered' in higher education (McGettigan, 2015 p.2). From such metrics, prospective students can determine what would bring the greatest return on their investment. Rather than degrees having a generic value and universities enhancing public knowledge, these metrics entrench the idea of degrees as private undertakings to boost future earnings.

5.2 Widening Participation

On both occasions that tuition fees rose there was an increased policy focus on widening participation. In order to charge more, universities had to increase efforts to reduce inequalities in access to higher education. This was against the backdrop of efforts to get fifty per cent of young people to university discussed earlier. The Office for Fair Access was responsible for evaluating widening participation outreach activities, although this, like HEFCE, was recently subsumed into the Office for Students. In 2012, the Widening Participation Research and Evaluation Unit (WPREU) was set up at the University of Sheffield and, subsequently, produced a range of reports and articles on aspects of widening participation. Their most recent publication reflects on their work in the preceding five years and the field more broadly (Crockfield *et al*, 2018). This provides an excellent background on widening participation and the impact that initiatives have had, including approaches to the effective evaluation of these projects.

Crockfield *et al* (2018, p.42) argue that government changes made to tuition fees and DSA provision have created barriers to widening participation efforts made by universities. This has created a paradoxical situation whereby government is demanding more progress on widening participation but is cutting the funding to provide it. Recent research indicates that the increase in fees can put off the debt-adverse from applying to university and that those most likely to be debt-adverse typically come from widening participation groups such as working class students (Callender and Mason, 2017). The Russell Group has recently been in the spotlight for failing to admit sufficient numbers of students from ethnic minorities and poorer backgrounds, with a decline in numbers at some universities from previous years. The Higher Education Statistics Agency recorded a 0.1 percentage point increase in the proportion of state-educated students starting full-time undergraduate courses in autumn 2016, although the overall number had fallen by 17% since 2011-12 when part-time student numbers were taken into account (Weale and Barr, 2018).

Despite the fact that more people are going to university there are differences in attainment and outcome for various groups of students (Brewster, 2016). The attainment gap for students from BAME backgrounds as well as students with disabilities represents ongoing challenges for the Higher Education sector, as do differential graduate outcomes for these groups of students. This is particularly striking given the higher level of aspiration amongst BAME young people. Whilst 75% of white pupils aged between 11 and 16 state they intend to attend university this figure rises to 81% of Asian pupils and 85% of Black pupils

(Cullinane, 2018). This disparity between aspirations and attainment at university requires further action.

HEFCE's 2017 Catalyst Fund supported seventeen different projects on the theme of 'Addressing barriers to student success.' There was an express aim to 'cover a broad range of areas across the student lifecycle, including:

- Inclusive and active teaching and learning practices;
- Well-being for students;
- Progression to postgraduate study; and
- Graduate employability. (OfS, 2018)

A database of these projects can be found on the Office for Students website and there is a prominence of projects focused on addressing the differential outcomes of students from lower socio-economic backgrounds and BME students. These 17 projects involve 59 HE providers and this includes DMU's Freedom to Achieve programme. There is less attention on students with disabilities. A limited number list students with disability as a target audience and just one, 'Embedding and sustaining inclusive STEM practices' conducted by the Open University in partnership with the University of Leeds and Plymouth University has disabled students as its specific target group. As these projects are still in progress there are no available evaluations currently, although it is clear from the first bullet point the congruence held between innovative teaching and learning practices and widening participation.

5.3 Teaching Excellence Framework (TEF)

The government introduced the Teaching Excellence Framework (TEF) in 2016, which built on the Research Excellence Framework (REF) and further entrenched the trend for metrics to measure universities and performance. The aim of the TEF is to assess the quality of teaching to enable differentiation between universities and, in turn, shape the amount universities could charge in fees. As a result, teaching quality has become part of the wider discussion around value-for-money in higher education.

Emphasis was placed on widening participation in the first TEF submission as universities had to provide metrics on age, disadvantage, ethnicity, sex and disability of their students (Crockfield *et al*, 2018). Ideas of access, mobility, outcomes and quality are, therefore, all folded into discussion about teaching excellence. The TEF also draws on nationally collected data on student satisfaction (via the National Students Survey), continuation (using HESA data) and employment outcomes (via Destination of Leavers from Higher Education Survey). The metrics used has led some to reflect that it is a measure of student experience more than actual teaching quality, and the NUS urged a boycott of the NSS in response to the measure.

De Montfort University achieved gold status in the TEF and its UDL framework was a central part of its submission. The TEF panel statement, noted the 'outstanding support for students' learning, involving them in changes to support assessment methods and teaching delivery' (DMU, 2017).

The TEF remains a controversial measure of teaching and learning at universities (Crockfield *et al*/2018, p.42). A pilot of a subject-level TEF has been carried out (2017/18) and there are plans for a postgraduate-level TEF to follow. There are planned changes to the metrics for TEF, although it looks set to remain as part of an increasing effort to measure the performance of universities quantitatively. Paradoxically, the TEF persists whilst direct funding for teaching quality enhancement within the sector has ceased. In his discussion of the present dearth of funding for teaching enhancement projects at a national level, Kernohan (2018) notes that metrics such as the TEF and NSS do not in themselves enhance teaching, although 'the visibility of these data sources leads to a decline in 'risky' experimentation' within universities.

6. Discussion

This literature review has analysed the existing literature on UDL in post-secondary education and, crucially, placed it within a broader discussion of inclusive learning and the landscape of higher education in the UK to enable a reflective examination of UDL at DMU. It is, of course, impossible to cover everything. Certainly, there are reams of literature on ITL as well as much in-depth work on disability and education that have not been covered here in addition to the countless articles, blog posts and so forth on the UK higher education sector. The aim of the literature review was to point up key debates and arguments within these fields.

There are a number of key ideas that have been raised in this review that must be considered moving forward.

- The existing studies of UDL do not go far enough. There is no comprehensive study of UDL throughout an institution. This precludes an examination of how UDL affects the teaching and learning in different faculties and can be mapped onto a broader idea of institutional change. Indeed, an institution-wide study of UDL would contribute to a deeper understanding of the structure and language of change.
- More work is needed on how UDL affects different intersections of students. Does it effectively level the playing field or is this realistically beyond the scope of UDL methods?
- Whereas DMU Replay is a cornerstone of UDL provision at DMU, there is little existing literature that examines the capacity of lecture capture to deliver the principles of UDL. This demands considered enquiry due to the subsumption of UDL as lecture capture by some at DMU.
- None of the studies on UDL in post-secondary education have been carried out in UK universities. Therefore, there has been no consideration of how UDL can be used as a strategy to meet the learning demands of students in relation to changes to the DSA, widening participation initiatives or the government's increasing emphasis on measurable impact and outcomes for universities using a range of metrics from TEF to NSS.
- The methodologies of existing studies rely predominantly on qualitative data retrieved via interviews and questionnaires. Whilst these methods reveal important trends and themes around the implementation and reception of UDL, DMU's commitment to co-creation between staff and students has the potential to develop innovative methods to evaluate the impact of UDL and experiences of students.
- Further work is also needed around the impact of UDL on staff development and, more broadly, quality enhancement. The emergence of metric driven reporting of the performance of universities in the UK has led to an onus being placed on quality assurance ahead of quality enhancement in the context of alleged pedagogic innovation. Without the availability of external funding, risk-taking in relation to experimental pedagogic practice is contingent on the flexibility of institutional innovation and the support provided within universities. There needs to be a meaningful discussion about how innovation in teaching and learning can deliver quality enhancement and, crucially, this discussion must be driven by an understanding of quality enhancement that is predicated on more than measurement

analytics. Quality enhancement must be recognised as a means to ensure continuous improvement for both staff and student alike.

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