ABSTRACT

This case study highlights a number of approaches to building a UDL community of practice (CoP) within a higher education institution. The traditional method of building a CoP was followed to develop staff knowledge and awareness across the university on UDL principles. This was underpinned by the creation of membership of shared interests, working groups, developing policy and staff guidance, and providing training and development for staff. A second more personalized approach known as ‘Plus One’ was also utilized to embed UDL principles to a new aerospace engineering module. The areas to focus on, known as pinch points, related to the historical expertise of the academic that are often repeated each term. In this case study, it was decided to focus on clear communication, choice, flexibility, accessibility, and inclusive assessment. The results showcase a positive appreciation from learners by having choice incorporated into their learning and assessment. It reduced the academic workload in terms of learner queries by having clearer consistent communication channels put in place.
Building a Community of Practice Across an Institution

INTRODUCTION

The case study described in this chapter outlines how Queen’s University Belfast (QUB) in Northern Ireland is attempting to build a Universal Design for Learning (UDL) community of practice (CoP) among both academic and non-academic staff. The chapter firstly highlights the traditional way of building a CoP. This includes a shared interest in a topic, building knowledge among faculty and the dissemination of good practices of embedding UDL across campus. Some examples of building a CoP include the development of policies, faculty training and professional development, lectures, seminars, faculty guidance, resources and online courses. In addition, a second less traditional method of a CoP was explored by collectively incorporating the “Plus One” approach (Tobin & Behling, 2018) where an academic developer supported a faculty member to embed UDL into their practice.

For a number of reasons, faculty can be hesitant to embrace UDL. This can be a consequence of time constraints, teaching philosophy, lack of familiarity, or just seeing a change of practice as another add-on to an already high workload. All that may result in not implementing the UDL principles at all.

Therefore, rather than concentrating on the various checkpoints from the UDL framework (CAST 2018) which can sometimes be overwhelming, this case study provides an insight into an alternative approach, the “Plus One” method, as an introduction to UDL. Moreover, the approach targets ‘pinch points’ based on the expertise, knowledge and previous teaching experiences of faculty, that allows faculty to intentionally focus on areas that cause barriers to learn such as inaccessible PowerPoints, group work, no structure to a course or lack of clarity around assessment. The use of pinch points to “retrofit a course to embed UDL principles can reduce the number of emails, questions in class from students seeking clarity on a topic or assessment and save significant time re-teaching” (Tobin & Behling, 2018 p.109-112).

The chapter starts by outlining the institutional context and background of the university and of the case study. The literature review describes four key areas relevant to the case study, CoP, UDL in education, Plus One approach and accessibility. Details of the module showcase the methodology of the case study by describing some of the pinch points, choice and flexibility, inclusive assessment and accessibility. Rather than focusing solely on the results or outcomes of the case study, the faculty member and academic developer wrote a personal reflection outlining the process of the collaboration and describing the enablers and barriers of embedding UDL into a new module from two perspectives. The chapter concludes by outlining the limitations and sustainability of the approaches that could benefit other higher education institutions (HEIs) and possible future research.

INSTITUTIONAL CONTEXT

Queen’s University Belfast (QUB) was founded in 1845 as Queen’s College and eventually became a university in 1908. QUB has approximately 25,000 learners with 4,500 staff and it is located in Belfast, Northern Ireland. It is a Higher Education (HE) institution that is part of the Russell Group that includes 24 universities across the United Kingdom (UK) that put the emphasis on evidence based research. Some other well-known universities in this group are Oxford, Cambridge and Imperial College, with Queen’s the only institution not on the mainland UK, but instead on the island of Ireland. Within QUB there are three faculties: EPS (Engineering and Physical Sciences), MHLS (Medicine, Health and Life Sciences) and AHSS (Arts, Humanities and Social Sciences). The three faculties are divided up into fifteen schools that deliver different programmes.
BACKGROUND OF THE CASE STUDY

QUB is at the early stages of its journey to embed UDL into the curriculum institutionally. Within the university, the Centre for Educational Development (CED) provides professional academic development, accreditation and support for faculty across teaching, learning and assessment, and digital skills. The author is an academic developer who works within CED and is the lead on numerous Equality, Diversity and Inclusion (EDI) projects that include UDL, Accessibility and Internationalising the Curriculum. Over the past two years, UDL has been written into a number of policy documents in the University, along with faculty guidance through UDL checklists, UDL workshops, embedding UDL in online courses and an accessibility toolkit underpinned by UDL. Numerous resources have been developed to promote the three UDL principles and to disseminate best practice. Institutionally, the approach of embedding UDL across the curriculum took what Moriarty and Scarffe (2019, p.55) call “a slow burn” approach. This approach consists of gradually building an awareness of UDL, to increase faculty knowledge and understanding through various methods and communications, rather than adopting a top-down only approach, where it is enforced upon faculty.

A formalised UDL working group was set up and chaired by the academic developer that consisted of key stakeholders across the institution drawn from faculty, professional services, student support, and directors of education (middle management) to build knowledge and awareness of UDL institutionally. However, when examining the group’s membership or indeed the faculty attendance of the UDL training provided, it became clear that there were limited numbers from any Engineering disciplines. Therefore, it was decided to reach out to some Engineering faculty and propose specialised support with the intention of embedding UDL principles across a module. A faculty member with limited UDL knowledge or experience who was developing a new module was identified as a suitable partner in the collaboration. The case study started with a simple conversation around teaching philosophy, current teaching and learning practices, learning outcomes, curriculum content, assessment and accessibility. The overall purpose was to build a community of practice and to encourage others from the discipline to start the journey of embedding UDL principles.

LITERATURE REVIEW

The literature review for the case study explores the traditional CoP approach of building networks among shared interests to embed UDL across an institution. The CoP approach highlights the benefits of sustained collaborations among faculty and non-academics toward the same goals through a top down, middle out and bottom-up approach. The increasing interest around UDL within HEIs are highlighted and discussed, including STEM subjects. The “Plus One” approach is outlined and showcases how the academic developer and instructor worked collaboratively by focusing on a number of pinch points. Finally, accessibility is discussed in how it compliments UDL, how the UK accessibility regulations are now in force and the various attempts across QUB to support faculty to ensure a more inclusive and accessible learning environment.
Community of Practice Approach

The theory related to Communities of Practice (CoP) has evolved over time and crosses many boundaries into a range of sectors and across many platforms. The main purpose of CoP as a concept, irrelevant of the context, is that it refers to groups of people who share a concern or a passion for something they do, and who wish to learn how to do it better as they interact regularly to discuss their reflection on practice (Wenger and Traynor, 2015). A CoP may be characterised as a “group of practitioners who interact with each other to share their expertise about some aspect of their practice. They jointly develop and learn about a shared repertoire of resources” (Lewis, 2013 p.2). Similarly, Wenger (1998) defines a CoP as a mutual engagement in a joint enterprise with a shared repertoire, and this resonates strongly with this case study. According to Boud and Brew (2013), building and sustaining academic communities creates meaningful professional learning opportunities and fosters context-specific knowledge in shared practices, such as UDL, in this case.

The domain, the community and the practice are the three characteristics that are essential in creating a CoP and it takes a combination of these to see it come to life properly. Firstly, there has to be a shared domain where a commitment is made that distinguishes the members from other individuals in the organization. Secondly, the membership forms a community that showcases a commitment to the topic and a desire to learn from one another. Thirdly, through these shared collaborative efforts and intentional sustained interactions, the outcome should result in further exploration of the topic, leading to co-creation in applying best practices or practical solutions to the issues outlined. A combination of these three characteristics will result in a CoP (Wenger, 2009).

The work of Lave and Wenger (1991) in relation to CoP focused on situated learning theory that emphasises knowledge and skills sharing and viewed it as participatory in nature, and as a process of building relationships, networks and social participation. CoP encourages faculty and staff to participate in professional development opportunities to enhance their teaching skills in HE (Chun and Williams 2020, p.3). According to De Carvalho-Filho (et al, 2019) the act of intentionally adopting a CoP for faculty development needs to incorporate a number of elements such as: a specific goal, intentional invitation of members, institutional support, worthiness for both the members and the institution, sustainability, communication of success, and evaluation of the CoP. According to Linet (2016) the role of academic developers should include developing networks, facilitation, providing relevant expertise, improving harmony within CoPs, and harnessing the benefits of internationally dispersed CoPs. Although academics, as educators, often experience success in developing instructional methodologies in relation to the discipline within which they have expert knowledge, they sometimes “lack a powerful connection to CoP opportunities that could contribute to improving the quality of teaching and learning” (Bouchamma & Michaud, 2011 p. 404).

In QUB, a CoP framework for UDL has been adopted through a three-prong approach. In the first stage, a top-down approach was utilised with support from senior management, within which UDL was written into various institutional policies and faculty guidance documents from CED. In the second stage, a middle-out approach through various forms of communication with middle management was adopted. This approach was based on the engagement with the Directors of Education (DE) who at QUB oversee all aspects of teaching, learning and assessment in the schools. The main aim was to advance the understanding of UDL and to provide a strong foundation upon which to build a collaborative approach to change management in relation to curriculum and pedagogy, as suggested by Moriarty and Scarffe (2019 p.66). Finally, in the third stage, a bottom-up approach driven by the academic developer was achieved.
Building a Community of Practice Across an Institution

and involved supporting staff through UDL workshops, designing and developing a UDL checklist and UDL institutional guidelines, speaking at school education training days, hosting internal seminars, and inviting external experts to QUB. To date, these approaches to CoP across the institution have involved approximately 500 faculty members and will continue to be discussed throughout the chapter.

UDL and Education

UDL according to Capp (2020, p.708) “is based on the view that when a student does not make progress in their learning, educators look for potential barriers in the curriculum and their pedagogy, rather than barriers caused by the student”. The aim for the UDL framework is for students to become expert learners. Students have varying abilities, preferences, cultures, languages, and experiences, all of which affect how they learn (Meyer, Rose, & Gordon, 2014). In addition, Olaussen and colleagues (2019 p.13) state that each “learner is affected by different experiences, strengths, age, abilities, and while they have different perspectives and preferences, they all come with the expectation of learning”.

UDL has existed for over thirty years, and the majority of the research in the first 20 years has been based on formal educational settings of school aged children in the United States of America (USA). For many years the main aim of the research was on the implementation of UDL principles in a school context, in relation to disability, inclusion and systems of equity (Nelson 2014; Novak 2016, 2017; Long 2018), with few studies related to STEM specifically (Rao et al., 2014 and Basham and Marino 2013). More recently, UDL has been written into school policies and legislation such as the Every Student Succeeds Act (ESSA 2015) in the USA references UDL, referring to it as a scientifically valid framework (Criag and colleagues 2019, p.2). Also, the Australian Curriculum Assessment and Reporting Authority (ACARA) (2012) implemented UDL considering it as an “inclusive pedagogical framework for breaking down barriers to the Australian Curriculum for students with disability and diverse learning needs” (Capp 2020, p.709).

Globally, with the expansion of enrolment in HEIs, the number of under-represented groups and diverse learners gaining access has increased exponentially (Bracken & Novak, 2019). The variability of learners has increasingly changed including a diverse range of abilities, cultural backgrounds and family structures of varied socio-economic levels (Craig and colleagues 2019, p.2). However, expanded access of diverse learner groups does not fully address the issue of social equity. In recent years, there has been a push for scholars and practitioners in HEIs to extend the use of the UDL guidelines beyond students with disabilities (Sheffler and colleagues, 2019), and to align UDL with culturally responsive and sustainable pedagogy (Kieran & Anderson 2018; Hanesworth and colleagues, 2018) to ensure the inclusion of all learners who are black, indigenous and people of color (BIPOC) or black, asian, minority or ethnic (BAME) groups in the UK. Obviously, both acronyms face criticisms as they follow a one size fits all approach, rather than the variability of the different cultures and diversity within each group. International efforts to embed UDL in postsecondary education has significantly increased, with numerous examples of good practice emerging across education sectors as a model for inclusive practices (Gronseth & Dalton, 2020; Al-Azawei Serenelli, & Lundqvist, 2016; Murawski & Scott, 2019; Bracken & Novak, 2019). This new interest in UDL is also a consequence of the widening participation agenda that is specially targeted at under-represented groups gaining access to university (Rainford 2021; Bracken & Novak, 2019), and of the stronger interest on EDI policies and practices for both staff and students (Guyan & Douglas 2019; NUS 2019; EHRC 2019) in response to an increasingly diverse student population.
In terms of STEM at the postsecondary level, UDL principles are still mostly related to disabled students (Thurston et al, 2017; Kreider et al, 2018; Seok et al, 2018; Langley-Turnbaugh et al, 2013) rather than learner variability and inclusion more generally. Nonetheless, embedding UDL into STEM explicitly “help[s] professors and instructors to create syllabi, lessons, and assessments that are accessible that will lead the way for students of all abilities to be successful in STEM fields” Schreffler and colleagues (2019 p.8). While the module in question is a STEM module, the aim of the case study was not specific on STEM. It is nonetheless important to highlight the lack of research that includes STEM and UDL in HEIs.

**Plus One Approach**

While there are more faculty embracing UDL at HEIs (Bracken and Novak 2019) across disciplines, the framework can often be overwhelming. For this reason, the academic developer intentionally chose to utilise the “Plus One” approach with the faculty member, as the foundation for this case study and to further build a CoP. According to Tobin and Behling (2018 p.136) the concrete benefits of adopting a “plus one mind-set, UDL becomes a process of identifying areas of greatest need, based on your previous experiences, and addressing those needs in order to keep students motivated, on task, and learning”. Whereas Thurston and colleagues (2017 p.54) indicate that the goal of the “Plus One” approach is to “directly support staff in building a model for teaching and learning that is inclusive, equitable, and guides the creation of accessible course materials”. In HEIs, “faculty are knowledge experts and have the historical data to identify key issues or challenges that learners face and that re-appear each year”, coined as “pinch points” by Tobin and Behling (2018 p.109-113). For example, each term instructors could experience high levels of student communication, queries on assessment transparency or grading, feedback complaints, conflicts around group work, instruction or trying to locate course materials, issues that most educators can relate to.

The purpose in adopting the “Plus One” approach is to shift from what could initially be considered as an insurmountable amount of effort to implement change, and to instead focus on one or two ‘check-points’ of the UDL framework, or ‘pinch points’ to ensure faculty workload when implementing UDL is more manageable and palatable. In this case study, the ‘pinch points’ related to small intentional changes that focused on specific aspects of the UDL checkpoints: i) accessibility, ii) choice and flexibility, and iii) inclusive assessment.

**Accessibility**

HEIs are becoming increasingly interested in the potential of the UDL framework to support instructors tasked with designing accessible and engaging learning environments (Berquist & Neapolitan, 2019 p.103). UDL is often closely associated with, and aligned to, issues of accessibility, particularly in relation to inclusion, ease of access to materials, provision of multiple formats for learner variability and equality of opportunity for all learners. Black & Fraser (2020, p.252) discuss how “UDL cannot be achieved without accessibility, but attributes of accessibility can in some instances be realized without a systemic UDL approach… UDL is not simply a matter of access; it’s about equity and experience”. Whereas (Tobin & Behling, 2018 p.134) state that UDL is about changing the mindset of faculty so that they no longer focus on specific accommodations, but instead look at inclusion as an “iterative process by creating progressively more inclusive course content and interactions to be increasingly more accessible.
to all learners”. Accessibility is a “hot topic in higher education… [and] there’s a growing recognition that accessibility must extend beyond simply meeting the needs to students with disabilities” (Black & Moore 2019, p.65). Internationally, HEIs have “embraced the core principles of UDL to increase accessibility and engagement, increase retention and attainment, and improve the outcomes of all students” (Bracken & Novak, 2019, p.4).

To further build a CoP across the institution to embed UDL and accessibility, CED designed an online self-study course for faculty called Accessibility Toolkit to showcase good practice in content design for learner variability. This was a direct result of the UK Accessibility legislation that came into force in September 2020 in relation to public body sectors, that included HEIs. The online course was underpinned by UDL principles which impacted “positively on learning flexibility and success, reducing learning stress and enhancing the social presence of learners” (Kumar & Wideman, 2014). This gave further momentum to the increased knowledge of accessibility and UDL through the professional development of faculty that also included online 30-minute drop-in sessions to compliment the course. It was a further example of how to build an opportunity to consolidate the culture of quality in teaching and learning (Carvalho-Filho et al, 2019). At an individual CoP level, Moore (2019 p.235) suggests that first, we must meet faculty where they are in relation to their practice when attempting to embed UDL. Support staff must “listen closely to their needs and the barriers that they face”. Tobin & Behling (2018) put forward the notion that “instead of adopting the mindset that we must relatively address every access need, we can design our interactions so that the greatest number of people can take part in them without having to ask for specific accommodations.”, where faculty can instead focus on creating accessible inclusive learning environments for all learners.

THE MODULE

The case study is based on an effort to embed UDL into a new module (Aerodynamics 4) that is part of the Aerospace programme taught in the School of Mechanical and Aerospace Engineering (SMAE) at QUB. The Aerospace programme includes two pathways: a BEng (Bachelor of Engineering) and an MEng (Master of Engineering), with common modules for the first two years of study. On average 25/30 students per year are enrolled in the BEng and 20/25 students in the MEng Aerospace pathway. In the 2019/2020 academic year, 28 students enrolled in the module. Overall, the students had 36 hours of contact time and 64 hours of self-study time within the module.

The module in question had four students registered with disability services. While disability is not the focus of the chapter, it is interesting to note that none of the four students applied for any form of accommodation that they would have been entitled to. The students kept the same deadlines as all other students throughout the semester, which is mostly not the case. In addition, no other student sought any accommodations in the case of hidden disabilities or students who chose not to disclose before or during the term.

The next few sections highlight what the instructor involved in this initiative did in relation to the module design and the ‘pinch points’ identified, the first one being choice and flexibility. This was based on the instructor’s historical knowledge, teaching experience, confidence in making these changes, and the one-to-one support in academic development available to them in relation to the three UDL principles.
CHOICE AND FLEXIBILITY

CAST (2018) strongly advocates that UDL is not something that one ‘does’ but a framework for viewing one’s teaching and learning practices so that learners have options and choices to challenge themselves and are provided with the opportunity to develop as an autonomous learner. Equally, Anderson (2016) focuses on supporting learners to make effective choices about their learning by empowering them to self-reflect, make choices, and learn from those choices. This in turn minimises the barriers that prevent educators from embracing the UDL framework. Choice in assessment is becoming “more common in assessment practices, as an inclusive approach” (O’Neill & Maguire 2019). For assessment choice to be effective and more widespread, “it needs to be fair to all students and additional staff development needs to be provided to enable staff to explore the design and evaluation of this approach” (O’Neill & Maguire 2019, p283). In addition, Suwannawat (2020, p.17) refers to why “flexible methods of representation are important to academic assessment as they provide students more freedom to demonstrate and express their learning ability, instead of confining them to a single method that might be restricting their actual performance”. Through collaboration the authors were able to navigate their way through embedding inclusive assessment into the new module by providing choice in topics and how learners demonstrated their knowledge.

Flexibility in implementation is the hallmark of the UDL framework (Meyer and colleagues, 2014). Moreover, by “proactively planning for flexibility... learning and teaching is made accessible for all students” (Capp 2020, p.707). Thinking about both of these intentionally in the curriculum design, in the learning and teaching activities and in all forms of assessment, is probably the most difficult aspect of UDL and the one that staff struggle the most with initially. Flexible learning focuses on giving students choice in the pace, place and mode of their learning, and all three aspects can be grounded in pedagogical practices that are supported and enhanced by e-learning (Gordon 2014, p.3). According to Jones-Devitt (2020, p.8), for faculty in HE to develop flexible learning, they “will have to unlearn some of their thinking and practices to become more effective facilitators of flexible learning in partnership with students... rather than acting solely as gatekeepers of expected behaviours and standards”. For the purpose of this case study, the authors agreed that a flexible blueprint would be developed aiming to create an inclusive and accessible learning environment where learner variability was at the core of decisions made, which would represent a shift away from a ‘one-size-fits-all’ approach. According to Al-Azawei and colleagues (2016), the UDL framework is extremely efficient in supporting the design of flexible learning environments and accessible content. Through the many discussions around learning outcomes, teaching methods, materials to be used, and possible assessment formats, it was decided by the authors that they would choose to focus on features of the course where it was possible to incorporate flexibility in the content delivery and assessment.

Multiple Means of Engagement (The Why of Learning)

According to Conner (2016), engagement represents one of the key concerns of educators in contemporary learning. Bracken and Novak, (2019 p.5) note that in order to build engagement, there must be “multiple options to foster both attention and commitment in all learners to address the unique variability, interest, effort and perseverance, and self-regulation strategies”. In this case study, different engagement methods were embedded throughout the module. From the outset, the module overview was posted to the LMS (Canvas) well in advance of the commencement date; it outlined transparent learning outcomes, teach-
Building a Community of Practice Across an Institution

In week one, the lecturer explained what inclusion and accessibility meant in terms of coursework, content design, assessment and activities that would occur throughout the term. The instructor aimed to ensure all text documents, student communications, PowerPoint slides and all content embedded directly into Canvas were fully compliant in terms of accessibility. Throughout the module, students were given clear instructions at the beginning of the week, including all the necessary content and opportunities were provided for students to question or query anything that remained unclear.

Flexible learning methods were a core part of the teaching, and learners worked collaboratively through multiple formats such as discussion forums, flipped learning, in-class discussions on specific tasks, assessments, and working out problems in the lab. Group work was embedded in the module, and a significant amount of negotiation occurred throughout the module to ensure that the groups worked on tasks together. The process involved allocating specific roles, building a rapport, setting up rules and procedures to ensure any barriers or disagreements were minimised. The weekly interactions during class time enhanced individualized and group collaborative learning, along with developing group dynamics that assisted with the final group assessment. Scaffolding and feedback through different stages of the module were implemented and learners had to collaborate and provide a draft submission for peer review, based on the co-created rubric for assessment.

Multiple Means of Representation (The What of Learning)

Representation guidelines remind us to provide multiple formats when teaching in order to activate all of the students’ recognition networks. Historically, for example, “reading and lecturing were popular teaching methods, and such approaches potentially entail countless embedded barriers for many students” (Bracken & Novak, 2019 p.5). To overcome that in the current case study, the learning material was presented using multiple formats such as videos, PPT, Word documents, articles and quizzes posted on Canvas. PowerPoint slides were fully accessible for students, and both PDF and PPT formats were made available. The students were encouraged to edit, change the font, background, include hyperlinks, podcasts and include their own notes for revision purposes, in order to gain a clearer understanding of the course content. Interestingly, by week four a number of students had approached the instructor to thank him for having the option to edit the slides as for them it was revolutionary in terms of clarity, ease of reading and navigation. The PowerPoint slides were uploaded at least 24 hours in advance through a OneDrive link so that if any changes were made the most recent information was always available to students. According to Kumar and Wideman (2014), posting learning materials ahead of time prior to the class can reduce learner anxiety and allow students to better engage with the material at their own pace and in their own time. As well as weekly lecture notes and PPT slides, all tutorial demonstration worksheets were uploaded by week eight so students could go through the solutions before the final lab session and prepare any questions or queries regarding assessment. Communication practices were also transparent and explicit from the beginning of the module in the sense that learners were informed of the various ways to collaborate in the discussion forums and were made aware of how any official or formal communication would be sent through Canvas announcements and emails.
Multiple Means of Action and Expression (The How of Learning)

Bracken and Novak, (2019) highlight that it is imperative to engage students and to present content in a way that is accessible. However, in order to determine if students have gained an understanding of the content, instructors must evaluate learning using multiple strategies. In this way students have options regarding the type of assessment and ways in which they demonstrate skills (p.5). It has been well established in research that assessment drives learners’ behaviour (Careless, 2015; Boud & Molly, 2013; Winstone & Boud, 2020). Faculty have a role and a “responsibility in developing student partnerships because they have often control over assessment and feedback policies, design and methods” (O’Neill & Maguire, 2019, p.282). According to Rose and colleagues (2006), the choice as to the most suitable assessment method relies on the core goals of a module. Following Tobin and Behling’s (2018) recommendation, the “Plus One” design gives learners choice and provides the learners with the feeling of having control and options (p.91). They also expand saying that students are then able to demonstrate what they have learned in a manner that reflects their learning preferences or circumstances (ibid, p.196). Providing learners with the opportunity to demonstrate their learning and mastery of content and concepts through multiple means was the alternative assessment model that the educator developer and instructor tried to adopt.

INCLUSIVE ASSESSMENT DESIGN

The second pinch point was inclusive assessment. While there were pre-set assessment topics for learners to choose from there also was an option for learners to come up with their own topic once a rationale was provided to the instructor. Two groups sought out their own topic of interest, while the other four chose a proposed topic. Having the option to choose a topic title within the module content increased learners’ investment in the course as it was something, they were more interested in researching and exploring further. The coursework intentionally focused on a choice of just two types of assessments to avoid any concern, anxiety or feeling of being overwhelmed among learners. In order to minimise the barriers experienced by students the following process was followed:

Step 1: Introducing the Concept

Embedding UDL throughout the new module aimed to provide learner empowerment. One such way of achieving this was by incorporating choice in assessment. The idea was to allow students to choose how they wanted to demonstrate mastery of knowledge, ideas and concepts within a specific topic, in a way that focused on their personal strengths, interests and skills. Learners had a choice of the type of assessment within the coursework, as well as a written exam at the end of the semester. This gave students flexibility and ownership over the choice of assessment mechanism. Moreover, students had the possibility to directly contribute to the rubric (Table 1) of the summative assessment.

Step 2: Assessment Choice

The main object of the assessment was to allow students to research and investigate how the different aerodynamic and propulsion concepts taught in class were actually applied in the design of hypersonic
vehicles. The learners were divided into groups of four and given two different options of assessment. The first option was to develop a Screencast presentation; the second option was to design a poster. In order to meet the same learning outcomes between the two types of assessment, the poster included an extra step, a short 10-minute presentation. Both types of assessment included a final Q&A session.

The students may have been more familiar with the design of a poster having done it in previous modules. For this reason, one tutorial was dedicated to showcasing examples of Screencast recordings developed by students in a different module which the lecturer used to teach a few years previously. This allowed the students to have an insight into the development of a Screencast recording and to have the opportunity to discuss, during the same tutorial, standards and expectations, software to be used and so forth. Students were asked to make their decision as to the type of delivery they selected, one week from the tutorial. Overall, the choices were equally split between the two types of assessment.

**Step 3: Co-Creation of the Assessment Rubric**

A second tutorial was used to promote discussions among the students about the rubric, allowing them to have direct input in the definition of the headings for the rubric of this assessment and their weight (see Table 1). The students, divided into groups, were provided with different rubric exemplars for poster, Screencast recording, presentation and Q&A. They were then asked to discuss the exemplars among their group and to come up with their own rubric’s headings, their own weights and a rationale for their choice. At the end of the tutorial, everything was reported back to and discussed with the whole class. All the headings weights and rationale were annotated on a flip chart and collected by the lecturer at the end of the tutorial. Table 1 was the result of the co-creation of the marking scheme for the choice of assessment provided.

**Step 4: Time Allocated in Class for Discussion**

Building on Step 3, there were 30 minutes allocated during each tutorial for the student groups to communicate and work on their assessment. This time was an opportunity to share ideas, develop concepts and focus on the purpose and process of the assessment. There were a number of occasions where the groups chose to utilise the time in breakout rooms to work collaboratively within their assigned groups and focus their attention on the progression of the poster/screencast. It was also an opportunity to ask any queries, questions about what was covered in class or any issues that may have arisen from the group work.

**Step 5: Continuous Support and Feedback**

There was a Q&A discussion forum set up by the instructor where learners could post a comment or ask a question in relation to the assessment, which was utilised on a weekly basis. Students were also invited to showcase their poster or their screencast a week before the final submission deadline. The purpose of this opportunity was to showcase their work and to provide the students with the opportunity to see other posters/screencasts recordings and to provide peer-feedback. A mechanism was put into place so that each group was required to provide feedback on the work of other two groups. Peer-feedback was provided through an online form, set up by the instructor, which was based on the rubric that was co-created. In addition, further generic feedback was provided based on the assessment criteria by a different lecturer involved in the review process before the final submission.
Overall, students positively commented, both privately and through the module feedback process, regarding the different modifications introduced to the course. The possibility of having PowerPoint files instead of PDF was welcomed by two students because it did allow them to adapt the format to their needs: tablet, printing and so forth. One learner commented to the lecturer privately after class: “I really appreciate that you are not converting the PowerPoints slides to PDFs, this makes it so much easier for me to edit them and add in my own content, nobody has ever done that before” (4th year student). Another aspect that drew out comments from students and which was reported in the Lecturer Evaluation Questionnaire was related to the active participation of the students on the development and co-creation of the rubric, stating

<table>
<thead>
<tr>
<th>Categories</th>
<th>%</th>
<th>Not achieved</th>
<th>Acceptable</th>
<th>Proficient</th>
<th>Exemplary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro/Conclusion</td>
<td>10%</td>
<td>The introduction has not set the scene or have enough relevant information to introduce the topic. Conclusions do not highlight any major outcomes from the poster or vodcast.</td>
<td>The introduction has set the scene in an ad hoc manner but enough relevant information to introduce the topic. The poster or vodcast contains a conclusion but it is not clear.</td>
<td>The introduction contains information about the topic that is somewhat clear, interesting and logical order. The conclusion is clear and highlight some outcomes from the poster or vodcast.</td>
<td>The introduction clearly states information about the topic and is presented in a logical order leading the reader/listener to want to know more. The conclusion is strong and clearly highlights the major points.</td>
</tr>
<tr>
<td>Coverage of the topic</td>
<td>40%</td>
<td>The content includes minor details and it has several mistakes in the facts. Resources included are few and not relevant.</td>
<td>The content includes basic information about the topic, but it has some mistakes in the facts or key content omitted. Includes resources that are not always relevant to the topic described.</td>
<td>The content includes essential knowledge about the topic with minor mistakes in the facts or some content omitted. Includes some resources relevant to the topic.</td>
<td>The content covers all the topics in-depth with details and examples. The knowledge of the topic is excellent. Includes a variety of well researched and informative resources.</td>
</tr>
<tr>
<td>Clarity</td>
<td>10%</td>
<td>Layout, figures and flow are of poor quality. The reader/listener cannot fully engage with the content.</td>
<td>Layout, figures and flow are of acceptable level but do not facilitate the reader/listener into engaging with the content.</td>
<td>Layout, figures and flow are of good level but at times the reader/listener cannot fully engage with the content.</td>
<td>Layout, figures and flow are of excellent level and help the reader/listener to fully engage with the content.</td>
</tr>
<tr>
<td>Originality</td>
<td>10%</td>
<td>The product shows no evidence of originality and ideas are presented in a basic approach.</td>
<td>The product shows little evidence of originality and ideas are presented in a somewhat clear approach.</td>
<td>The product shows some evidence of originality and ideas are presented in a clear approach.</td>
<td>The product shows originality in the way the ideas are shown and/or presented in a creative approach.</td>
</tr>
<tr>
<td>Presentation level</td>
<td>15%</td>
<td>Delivery appears unprepared and speakers are unclear and difficult to understand.</td>
<td>Delivery appears rehearsed and speakers are clear but at times difficult to understand.</td>
<td>Delivery appears rehearsed and speakers are clear and understood.</td>
<td>Delivery is well rehearsed and smooth. The speakers are very clear and well understood.</td>
</tr>
<tr>
<td>Handling of questions</td>
<td>15%</td>
<td>Lack of understanding and awareness of concepts and topic. Responses of questions to a low standard.</td>
<td>Some understanding and awareness of concepts and topic. Responses of questions to an acceptable standard.</td>
<td>Good understanding and awareness of concepts and topic. Responses of questions to a good standard.</td>
<td>Exemplary understanding and awareness of concepts and topic. Responses of questions to a very high standard.</td>
</tr>
</tbody>
</table>

Table 1. Assessment rubric co-created with students of the aerodynamics 4 module
Building a Community of Practice Across an Institution

this was great communication with students to allow us to discuss and decide the marking rubric and how to give effective feedback. (4th year student)

A second student referred to it as good practice and stressed the clarity of mark allocation when setting a new assignment the lecturer held a session where the class could have input on the marking criteria in terms of what marks would be awarded for and how much for each section before using these suggestions to come up with a robust rubric for assessment that the class was happy with and understood clearly. This was very good practice and was helpful in shaping the assignment into one the class would find rewarding and easily understood where the marks came from.

COVID-19 Impact and Change in Assessment and Showcase Sessions

The COVID-19 health emergency brought the suspension of all lectures and tutorials just three weeks before the end of the semester. This led to unforeseen challenges for students in terms of collaborating efficiently. To address this pressure, the learners were given the possibility of changing the type of assessment delivery chosen. This flexibility was very welcomed by all students and interestingly all the groups decided to go for the poster presentation. Because flexibility on the assessment was already present in the module, the learners had already evaluated the pros and cons of the two different approaches. Consequently, when the situation changed and increased difficulties around collaboration arose during the lock-down, the change to a different type of assessment was natural, and easily accepted by the students. To allow students to adapt to the new situation, the deadline was postponed by a week. The poster presentation and Q&A session were moved from face to face to the virtual environment through the use of Microsoft Teams; a number of time options were provided to the groups for them to choose and this included the evening time. The peer-feedback was already designed to be carried out online, so no changes were required.

EMBEDDING UDL INTO PRACTICE: AN INSTRUCTOR’S REFLECTION

As a lecturer of seven years and a researcher six years prior to that, the author has always had a more traditional mind-set of teaching, in particular when it came to the way they would assess students. Over the years, however, the instructor has tried and tested different forms of assessment methods in order not to rely only on the final term exam. This has included group work assessment, screencast, report writing, presentations, oral interrogation, critical reflection and multiple-choice questions (MCQs). However, the concept of assessment choice was completely new to the author and slightly frightening.

In the last academic year, the author has had the opportunity to develop a new module that was never taught before in the School of Mechanical and Aerospace engineering. Having the possibility to design a new course gave the author the possibility of considering several aspects of the course, focusing not only on the pillar of content, which was always the starting point, the assessment and its alignment but also on the question of how to promote wider participation, student engagement and how to make the course more inclusive by thinking for the first time about accessibility. For those reasons, the author was interested to work with CED to investigate further how the UDL principles could have been embedded into a new module. After an exploratory discussion with the academic developer, the author’s reaction
was of partial resistance, feeling slightly overwhelmed by the UDL framework in an already busy period during which the focus was the development of content and assessment. The author also had some concerns on the introduction of the UDL principles related to assessment choice. The major concern was on how to ensure that the same learning outcomes were met by every student.

However, during the collaboration between both authors, different options were discussed, and a plan was put forward. The UDL discussions and increased growth mindset were pivotal in the implementation and success of this collaboration. One fundamental advantage of this synergy was the possibility of obtaining immediate feedback from the academic developer and examples of best practices to build upon. Eventually, two changes, underpinned by UDL principles, were implemented in the module where the students had a choice to demonstrate their knowledge through a screencast or presentation and the student inclusion in the co-creation of the rubric.

To the surprise of the author, the discussion activity on the rubric was very well attended and well received by the students as it had been shown in the teaching and module evaluation comments. The inclusion of the students in the workflow was facilitated because a rubric had to be developed for the new module. However, considering the comments received on how this activity increased understanding of “where the marks were coming from”, this is a form of practice that will be included again in a slightly modified approach into the course for next term.

Accessibility, choice and flexibility and inclusive assessment were the three ‘pinch points’ which, from the perspective of the author, were the areas of greatest need to ensure learner engagement, motivation and personal development. Consequently, for the new academic year, the author is planning to use these concepts further in order to help design the way the module is delivered. The COVID-19 pandemic has brought new challenges to the way teaching is provided and, based on the experience gained in this case study, the author is planning on including student voice within future discussions around the different ways one can deliver content in relation to learner variability.

### SUPPORTING UDL INTO PRACTICE: A REFLECTION

For the past two years, the academic developer has attempted to build a CoP through various ways as outlined in the chapter by focusing on a shared interest of UDL to include various campus stakeholders, across a multitude of activities, collaborations and projects. This case study allowed for an opportunity to collaborate with an instructor in a more collaborative way by providing personalised support in a process framed by an alternative method, the “Plus One” approach. This approach was manageable and sustainable as it is a situational, timely and dynamic process based on historical data drawn from the teaching experiences of the instructors involved.

There were many ways the authors communicated with each other. This included face to face informal open and honest conversations about barriers instructors face in their teaching and administrative workload, thirty-minute virtual meetings to check-in and discuss the inclusive design process and assessments of the module, as well as email correspondence to share resources and gather their thoughts in relation to the ‘pinch points’ that were to be chosen for the study. Having different ways to communicate and not being bound by one unique method or restricted to one meeting, as would be the case during faculty training, allowed for a more fluid process and better outcomes for the module. It was a process of ‘thinking together’ coined by Pyrko and colleagues (2016) that built a CoP by having a common purpose and goal to embed UDL.
Building a Community of Practice Across an Institution

Interestingly, the instructor came from a very traditional European educational experience (non-UK) but was very willing to learn, open to new ideas and wanted to change practice to better inform and prepare learners to become knowledgeable about the content and develop life skills through problem-solving and working in groups. The idea was always to work with the instructor to make intentional and informed decisions around what to pay attention to regarding the design, implementation, and delivery of the new module. For the instructor, having one-on-one support allowed for a move beyond their comfort zone; instead centering on one pinch point, was encouraged to delve deeper into more difficult aspects of UDL implementation, such as inclusive assessment by adding choice in learner demonstration of knowledge.

Before the term was over, a global pandemic hit during which COVID-19 forced all educational settings into a full lockdown resulting in a shift to emergency remote teaching. The fact that this module incorporated assessment choice meant that no further accommodations or alternative assessments were required. In fact, the only change that was eventually required was to move the presentations to an online platform, rather than on campus. Here too the instructor provided further options of suitable times (even outside of working hours), and the option to turn on or off their camera or to have the presentation pre-recorded if preferred. While the majority of the communication was done before the module commenced, due to the changing nature of the pandemic both authors kept in touch and discussed the different options available and have since remained in contact regarding various changes to be made to the module for next term, as it will be offered fully online through an online blended learning approach. The guidance provided was organic and was tailored around the needs and interests of the instructor in relation to UDL implementation and to the ‘pinch points’. There was no technological requirement or support needed in terms of digital skills or technological equipment as the instructor was highly competent in terms of navigating the LMS of the institution and designing digital content.

As far as the academic developer is concerned, the process was equally rewarding. The sharing of knowledge and expertise around UDL was enriching, and so too was the observation of witnessing the instructor reflect on their practice at a deeper level, to question and critique educational theory and see results of positive learner experiences. Nonetheless, without this type of support for faculty, the change process would be a lot slower, at a more surface level and would require a specific amount of time set aside to read, become informed, unlearn, reflect, discuss and share ideas which in reality is not always possible for most instructors, especially in research driven institutions.

LIMITATIONS

There were some limitations to the case study. Only one formal type of feedback from learners was collated regarding the process, and this was done through the standard module evaluation. The feedback was compiled from students approximately two weeks before the end of term, not allowing any further changes to be made to the module. The case study would have been enhanced if the authors had sought ethical approval for the project, but due to time constraints and the beginning stages of COVID-19 lockdown, this was not possible in practice. There was also an intention to seek further clarification from students before the final awarding of grades, but it was agreed that this would not be pursued due to unforeseen circumstances. Finally, while the “Plus One” approach worked well and a lot was gained by both authors, moving forward it would be very difficult to sustain or further develop this approach to a larger scale, involving more instructors due to time and staffing constraints and limited resources being
available. A more targeted approach to working collaboratively with EDI champions and programme
directors across the university would be more sustainable.

FUTURE RESEARCH DIRECTIONS

There are a number of potential future opportunities that could further develop and promote UDL across
the institution. Firstly, one way forward could be to support the setting-up of discipline-specific UDL
faculty professional development as part of the wider institutional promotion of UDL in collaboration
with the EDI champions across the three faculties, in particular within STEM disciplines. Secondly,
there is currently very little support or training specifically targeted at program director level within
the institution. This is an area that will eventually be developed further, as programme directors play a
key role in overseeing the course content of all module coordinators, the types of learning and teaching
activities that occur, the assessment practices adopted, exam board outcomes, feedback from external
examiners, drop-out rates, and learner progression results. Having a broader understanding of UDL and
encouraging intentional changes and collaborative conversations about modules will hopefully lead to a
training those who actually do the “development work on materials and interactions that UDL touches
upon would result in greater levels of adoption of UDL across the institution”.

Tobin (2019, p.4) highlights that “we should move the focus away from training only faculty mem-
bbers about UDL but also train the people who support them e.g. information technology departments,
teaching-and-learning centers, media services, academic-department staff, and the help desk”. A UDL
working group is already set up and consists of key stakeholders across the institution. The group already
increases knowledge and awareness, and promotes UDL and accessibility across campus. However, it
would be ideal, moving forward, to establish a more formal way to gather evidence of the impact, if any,
this has had on their own practice or that of their peers.

Finally, as pointed out by Fovet (2019), CAST explicitly altered its discourse to include all learners
and not just those with disabilities. He highlights the importance of ensuring international students are
included in the discourse and this was very evident in the CAST 2020 annual conference entitled UDL
Rising, where the emphasis was on the next iteration of the guidelines to include race, culture and more
inclusive pedagogies. Therefore, working across schools and the international officers that support and
work closely with international students (including BAME students) would be one way to further embed
UDL and build a community of practice.

CONCLUSION

The chapter explored different approaches to build a UDL community of practice across a Higher Edu-
cation Institution. The purpose of the case study presented was to further build on the CoP through an
alternative “Plus One” approach through a collaboration among an instructor and an academic developer.
The new module was in a STEM discipline and some non-traditional ways to engage and collaborate
with learners have been shown. It highlighted how the instructor implemented small changes to embed
the UDL framework that resulted in positive outcomes for learners and time savings for the instructor,
through focusing on ‘pinch points’. The chapter also highlighted the gains for learners in offering choice
Building a Community of Practice Across an Institution

and flexibility on how they present their knowledge and understanding of that topic, but also making content more inclusive and accessible. Evidence is presented showing that choice as part of the student assessment and partnership in co-creating assessment rubric increased learner engagement.

The collaboration, discussion around UDL, and the adoption of a “Plus One” approach with the instructor resulted in the development of novel teaching, learning and assessment approaches. The instructor already explored opportunities to further embed UDL next term by focusing on other ‘pinch points’ such as having to deliver an online blended learning module, chunking content and scaffolding and pre-recording short videos with captions. Moreover, the instructor has also shared his findings and experiences with work colleagues about UDL and accessibility, which has caused a snowball effect and helped further build and develop the CoP.

The collaborative experience between the instructor and the academic developer has provided some encouraging results in relation to designing and developing a new module embedding UDL principles. Thinking at a deeper level regarding interactions and communication also reduced the instructor’s work-load and resulted in less queries from students seeking clarification on tasks and assessments. From this project a deeper understanding was gained of the challenges, obstacles and doubts that faculty face, on a daily basis, around implementing any form of change to their practice due to time constraints, lack of support or accountability in having to do any form of professional development in teaching, learning or assessment.

To embed UDL across an institution is by no means an easy task to achieve and there continues to be a lot of work to carry out in this institution in this respect. However, there is an acceptance that UDL is good practice and that its adoption develops inclusive and accessible learning environments. It is acknowledged that adequate time, funding and resources are required to make the adoption and the embedding of UDL more tenable and sustainable across the university. There needs to be a joint approach, strong leadership, funding, resources, sufficient academic development and support, and an evaluation of the CoP that all come together before UDL implementation can be fully achieved. Incorporating a bottom up, top down and middle out approach is one such way to achieve this, but nonetheless, context is important as all HEIs will have their own policies and strategies already in place or that they might still need to plan and develop. Irrelevant of the institutional leadership or lack of it is important to remember to recognise in the words of Bracken and Novak 2019, p.356) that “educators, acting as committed agent of cognitive and social change for good, and drawing on the inspiration that UDL provides, can make a significant difference in transforming the lives of learners”.

ACKNOWLEDGMENT

The chapter is dedicated to Laurie who was part of the instructors’ journey in attempting to effect positive change in the learner experience. Sadly, Laurie passed away unexpectedly during the summer 2020, before receiving his final degree classification award. Laurie was a committed, highly motivated, determined and passionate learner who was not only a loss to his peer group, family and friends but also to the University community.
REFERENCES


Anderson, M. (2016). Learning to choose, choosing to learn: The key to student motivation and achievement. ASCD.


Tobin, T.J. (2019). Reaching all learners through their phones and universal design for learning. *Journal of Adult Learning, Knowledge and Innovation.*


**KEY TERMS AND DEFINITIONS**

**Academic Developer**: A person who is employed to support academics professional development in the areas of teaching, learning and assessment.

**Accessibility**: Within this case study accessibility was related to the content development and ensuring that all communication, PowerPoint slides and word documents were fully compliant in terms of accessibility legislation.

**Inclusive Assessment**: It is considered good pedagogical practice to use a range of assessment methods, implementing student choice, consider assessment and feedback timing, and develop assessment literacy.

**Instructor**: A person working in further or higher education with expertise in a specific area, that teaches and carries out research.

**Plus One**: A term coined by Tobin and Behling (2018) to think about UDL as a mindset of plus one thinking intentionally about interactions in your course/module. Is there one more way that you can keep learners on task, just one more way that you can give learners information, just one more way that they can demonstrate their knowledge or skills.