A Critical Evaluation of The Integration of a Universal Design for Learning Approach into a Module Using An ePortfolio: A Student Perspective.

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Abstract.

The concept of Universal Design for Learning (UDL) has been part of the teaching process for many years. Research articles have outlined UDL principles and how they can be used to promote inclusivity, but there is less research in relation to UDL practice from a student perspective. This research study aims to address that gap by critically evaluating the integration of a UDL approach into a brand management module using an ePortfolio, from a student perspective. The approach used in this study incorporates two of the UDL principles: multiple means of engagement and multiple means of action and expression. Both principles are applied through several assessment tasks using an ePortfolio. Objectives of the study include a review of the existing literature relating to UDL and an evaluation of the student experience in an Irish Higher Education Institution (HEI) using a responsive case study. The methodology adopted for this study combines constructivism and pragmatism as a basis for a mixed methods design. Overall research findings indicate positive student perceptions of the UDL approach adopted in the areas of multiple means of engagement and multiple means of action and expression. Students embraced the flexibility of choices offered through the range of ePortfolio tasks and expressed themselves in unique ways, both individually and in groups. They developed their reflection skills and took more autonomy over their own learning through peer assessment. Findings suggest that the use of such an approach enhances student engagement and enjoyment of the learning experience as they chose their own learning paths.

Keywords: ePortfolio; Student perceptions; Universal design for learning.

1.   Introduction.

Universal Design for Learning (UDL) is a key pedagogical approach used in education to promote inclusive and equitable education (Flood & Banks, 2021). UDL grew out of research in the fields of education, neuroscience, and the influence of digital technologies (Mayer, Rose & Gordon, 2014). It is an educational framework that guides the design of learning goals, materials, methods, and assessments with regard to a diversity of learners (Rose & Mayer, 2002). The principles are based on the idea that there is no such thing as a '*typical'* or *'average'* student. All students learn differently. Flexibility is built in that addresses learners' strengths and needs by applying the principles of UDL to programme design, delivery, and assessment (Rose, 2001, Heelan & Tobin, 2021), and the whole of the education and training system can be made more inclusive (Centre for Excellence in Universal Design, 2020). Teachers can examine their traditional teaching and learning practices and effectively make the transition to meet the needs of all students by applying a UDL approach.   The purpose of this study is to demonstrate a framework for lecturers to follow if they decide that such an approach is relevant to their teaching practice. There is research on specific applications of UDL within learning environments, including conditions necessary for implementation, common barriers, and lessons from the field (Centre for Applied Special Technology (CAST), 2018) but the area of implementation research is in its early stages. There is less research in relation to UDL practice from a student perspective (Murphy, 2020) and none specifically relate to the implementation of a UDL approach within the Irish HE system in the area of brand management. This research study addresses that gap.

CAST developed a UDL framework which incorporates three learning guidelines: (i) to provide multiple means of engagement, where teachers should stimulate motivation and sustained enthusiasm for learning, (ii) to provide multiple means of representation, where teachers should ensure that learners are provided with a variety of formats for learning, and (iii) to provide multiple means of action and expression, where learners are given ample opportunities to express themselves and demonstrate their knowledge in a variety of ways so that they get a chance to show their potential (CAST, 2018). This research study focuses on the UDL principles of multiple means of engagement and multiple means of action and expression.

There is also little empirical evidence about how Irish HEIs engage and adopt ePortfolios in teaching practice (Farrell, Buckley, Donaldson & Farrelly, 2021), and none within the area of brand management. This research study addresses that gap by integrating a UDL approach

through an ePortfolio. There are many definitions and interpretations of ePortfolios. Corley and Zubizarreta (2012, p. 65) define a learning portfolio as: "*a vehicle for bringing together judiciously selected samples of students' work and achievements inside and outside the classroom for authentic assessment over time. A typical learning portfolio may include both academic materials and personal profiles and may designate some of its contents as public or private*". Though elements of this definition fit within the context of the Atlantic Technological University (ATU) research study (e.g., sample of students work, authentic assessment, personal profiles, content can be made public or private), it does not include the technology aspect of the learning. Eynon and Gambino (2017, p.1) define student ePortfolios as "*web-based student generated collections of learning artefacts and related reflections, focused on learning and growth.*" This definition has been adopted for the purposes of this study. Student progress is documented through an e-platform (Pebblepad) and students are involved in the universal design of the learning assessment and related reflections, which makes the experience more authentic.

A responsive case study was conducted to critically evaluate the effectiveness of the integration of a UDL approach using an ePortfolio. A responsive case study is described as "*a methodology that allows participants to contribute what they perceive as relevant data to assist in the planning of the next offering of a course*" (Bates, 2008, p. 98). This research is limited to one module in ATU entitled Brand Management and one cohort of 56 students, year 4, on the Bachelor of Business (Honours) in Marketing and Sales. This case study is bound by the confines of this discipline, cohort, and module in ATU.

This paper begins with a review of the literature in relation to integrating a UDL approach into modules in the HE system across many disciplines. The research methodology is then outlined, followed by the design of the ePortfolio tasks, research findings, conclusions, and recommendations.

2.   Literature Review.

Many articles have been written about UDL principles and how they can be used to promote inclusivity (e.g., CAST, 2018; Meyer et al., 2014; Rao, Torres & Smith, 2021). Though the research indicates that there are benefits associated with the use of UDL, the wide variation in how UDL is described and applied in research presents a challenge for defining when and how UDL is effective (Cook & Rao, 2018). A key principle of UDL is that learner variability in the classroom is the norm (Meyer et al., 2014). Teachers can address learner variability by designing lessons that proactively build in flexibility, choice, and engagement so that students experience a more inclusive environment with fewer barriers to learning (Celestini et al., 2021).

In addition to the work by Meyer et al. and CAST, other organisations, such as AHEAD (Association for Higher Education Access and Disability) which is an independent non-profit organisation in Ireland, SOLAS (Further Education and Skills Service) and ETBI (Education and Training Boards Ireland), which are Irish state bodies, have also published useful guidelines to help educators learn about important aspects of introducing UDL as a key concept for creating inclusive learning (AHEAD, 2017; AHEAD, SOLAS & ETBI, 2021: Quirke & McCarthy, 2020). For the purposes of the ATU study, the literature has been reviewed in relation to two aspects of the CAST framework: multiple means of engagement and multiple means of action/expression.

2.1 Multiple Means of Engagement.

Multiple means of engagement has been referred to as the "*why*" of learning (Rose & Meyer, 2002) or the motivation for learning. This principle encourages teachers to keep students interested and motivated to learn. The affective networks of the brain determine how learners get engaged and stay motivated. Course instruction is designed to allow the learner to make an affective connection with the course content (Boothe, Lohmann, Donnell, & Hall, 2018). When applied to assessment, this means that there should be options for students to demonstrate their capabilities and opportunities provided for them to become more autonomous learners (CAST, 2018; Carrington, Saggers Webster, Harper-Hill &, and Nickerson, 2020; Tobin & Behling, 2018).

Flexibility and choice have been frequently argued to be an inclusive assessment option, where

students do not have to take up a task type that might disadvantage them (Lawrie et al., 2017). Allowing them to have a choice about how they demonstrate the skill is enough to increase their sense of motivation in the programme and increases the chances that instructors can connect with their students and their learning needs (Kennette & Wilson, 2019; Tobin, 2014; Tobin & Behling, 2018,). Parker, Novak and Bartell (2017) suggest that giving student real choices in the assignments they complete and the peers with whom they work, can boost their engagement and motivation, allow them to capitalize on their strengths, and enable them to meet their individual learning needs. Students want the opportunity to show what they know in real-life settings (Tobin & Behling, 2018). UDL in assessment draws out creativity and can improve the experience of all involved in multiple ways. It moves towards engaging students through assessment as learning activities where they are partners in the process (O'Neill & Maguire, 2019).

Corley and Zubizarreta (2012) suggest that an ePortfolio is an ideal way to achieve such authentic assessment. This view is supported by Rao et al., (2021) who suggest that digital portfolios can provide an authentic way for students to self-reflect on progress, highlight accomplishments, and share work with their peers. Torres and Rao (2020) suggest that digital tools can support students to build ideas incrementally and share with peers. This fosters collaborations and community and is supported by earlier research by Katz (2015) which showed that the application of the principles of UDL increased student engagement and peer interaction. Similarly, in a universal design study by Street et al., (2012), students commented favourably about peer engagement.   Seminar group work and discussions fostered peer interaction and collaboration. Burgstahler (2020) suggests that assigning group work places a high value on different skills and roles for which learners must support each other and can result in more inclusive cooperative learning.

An important technique in UDL pedagogy is scaffolding, which involves using step-by-step instruction to build skills until students master the steps on their own. It is essential to provide scaffolding and give students opportunities to express what they know in varied ways and provide feedback as students incrementally demonstrate their understanding of concepts (Cook & Rao, 2018; Rao et al., 2021). Teachers can provide scaffolds, such as allowing students to compose their thoughts using formats of their choice (e.g., recording audio and using images with text or creating a video), and giving students options to build projects incrementally.

2.2 Multiple Means of Action and Expression.

A study by Kumar and Wideman (2014) describes student appreciation of incorporating multiple means of action and expression into a course. Multiple means of action and expression relates to learning outcomes and how students demonstrate their knowledge and understanding of the course content (Boothe et al., 2018). Choice and variability is regarded as good assessment practice but it is not often used as an assessment instrument (Heelan, 2015). Using a variety of assessment types allows students with differing learning preferences to excel (Padden et al. 2019) and they should be able to choose from a broad range of options that let them demonstrate their understanding (Kennette & Wilson, 2019). Options can be expanded by using technology, which can empower students to be able to choose the supported learning pathway that aligns with their learning preferences and priorities (Gronseth & Hutchins, 2020). However, Yin, Ou, Davison & Wu (2018) caution that providing multiple gadgets, functions, information, and resources could be counterproductive, through inadvertently inducing technology overload.

Basham, Blackorby and Marino (2020) argue that UDL, along with the integration of modern technology can provide a proactive mechanism to account for learner variability and maximises student learning. This study builds on the work of Meyer et al., (2014) who suggest that technology offers a critical means by which to overcome learning barriers and to design learning environments with fewer barriers right from the start.
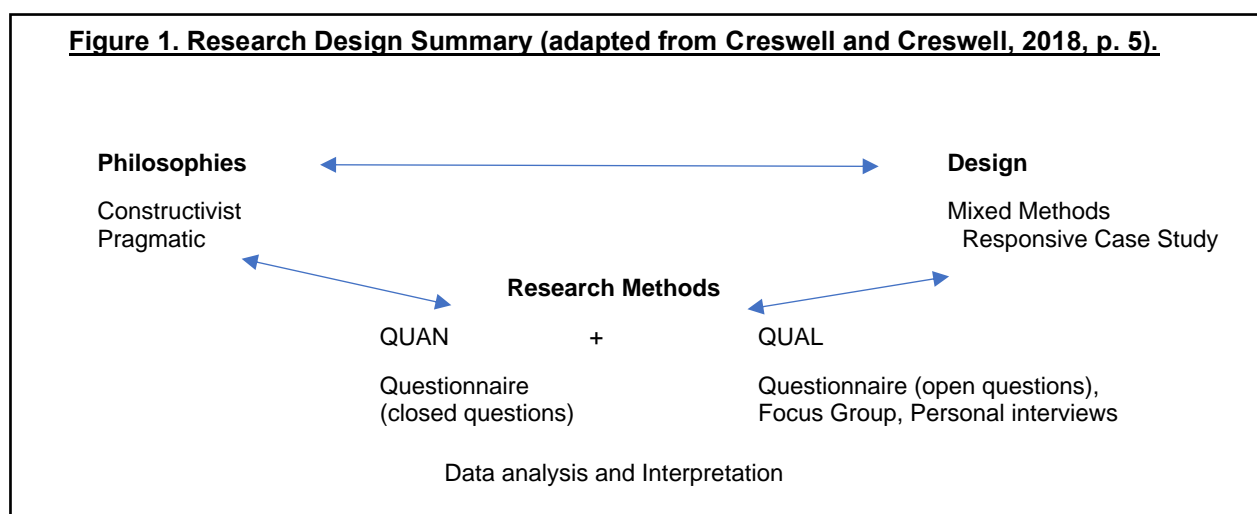
Though UDL can be implemented without the use of technology, learning technologies often enable designers and instructors to develop a responsive and interactive learning experience where the learner can interact with the content (Twyman & Heward 2018). This view also resonates with the study by Gronseth and Hutchins (2019) who suggest that UDL technology applications can help facilitate diverse learner needs and flexibility. They also suggest that pairing active learning strategies with technology tools can make learning more visible and foster collaboration. Social media tools such as Facebook or Twitter could be used to provide flexibility and encourage collaboration with other learners (Gronseth & Hebert, 2019). These strategies can provide supports for persistence and engagement by giving students ways to see and hear what peers are doing and saying about a topic and to give feedback to each other (Rao et al., 2021).

Giving students opportunities to demonstrate what they know using digital tools that allow them to use text, images, audio, and video, enables students to develop their ideas and express themselves in varied ways appropriate to the lesson goals at hand (Rao et al., 2021). Students

can create a digital portfolio/ePortfolio to showcase their work and progress over time, not only to peers and teachers, but to a wider community. White (2019) suggests that ePortfolios offer students the opportunity to create a well-organised visually appealing record of their academic and professional knowledge, skills and attributes and practical achievements. Morreale, Van Zile-Tamsen, Emerson, and Herzog (2017) suggest that ePortfolios help students integrate their learning and Moran, Vozzo, Reid, Pietsch and Hatton (2013) highlight the role of ePortfolios in facilitating collaboration with peers. Learning with an ePortfolio supports the development of critical thinking skills and reflection (Farrell, 2019, Scully et al., 2018) and provides an opportunity to observe student development over time (McManus, 2021). The next section of the paper outlines the research methodology.

3.   Research Methodology.

Constructivism embodied the ontological approach to this research. In terms of epistemology, a pragmatist paradigm was adopted. The mixed method design included both qualitative and quantitative methods. Qualitative methods were used, most notably personal interviews, open-ended questions on questionnaires and a focus group, to build up a deep picture of the student experience of the integration of a UDL approach into the Brand Management module using an ePortfolio.   This research study viewed the quantitative data and qualitative data as complementary to drawing meaning from the research findings to address the research aims. An outline of the research design used for this study is illustrated in Figure 1.

Figure 1. Research Design Summary (adapted from Creswell and Creswell, 2018, p. 5).

Philosophies   **Design**

Constructivist   Mixed Methods
Pragmatic   Responsive Case Study

                          Research Methods

QUAN   +   QUAL

Questionnaire   Questionnaire (open questions),
(closed questions)   Focus Group, Personal interviews

                    Data analysis and Interpretation

A mixed method design using a single responsive case study was deemed suitable for the current study as it was fit for purpose from a philosophical point of view and allowed students to contribute what they perceived as relevant data to assist in the planning of the next offering of the Brand Management module in ATU from a UDL and ePortfolio perspective.

Using a constructivist and pragmatist framework, a triangulation approach was used for data collection, including online questionnaires, a focus group, and a series of one-to-one personal interviews, as mentioned above. A mixed method convergent design was used to collect quantitative and qualitative data separately and then data was compared and contrasted (Cohen et al., 2018).

Teddlie and Tashakkori (2009) suggest that it is commonplace for mixed methods research to use more than one kind of sample. As the current study generated qualitative and quantitative data, it was considered appropriate to use a mixed method sample. The sampling procedure used was purposive sampling. In purposive sampling, researchers handpick the cases to be included in the sample based on their judgement of their typicality or possession of a particular characteristic being sought (Cohen et al., 2018). This sampling method is selective and biased, which may be considered a limitation, but it gave access to students who had in-depth knowledge about the impact of the universal design learning approach using an ePortfolio on their learning experience. In terms of the sample chosen for the questionnaire, complete collection sampling was used in which all the Bachelor of Business (Honours) in Marketing and Sales class (56 students) were invited to participate in the online surveys. In parallel with the questionnaire samples, students were chosen from the complete collection sample to participate in the focus group and personal interviews. This was achieved using probability systematic random sampling.

Part 1 of the data collection was the distribution of five short online questionnaires to students in relation to 1) needs analysis and 2) ePortfolio tasks (Appendix 1). Responses were collected anonymously using Microsoft Forms. The questionnaires which were designed around a five-point Likert scale, consisted of open and closed questions related to themes which emerged from the literature. Part 2 of the data collection was an online focus group with the lecturer and 8 students using similar criteria to the questionnaire. The final part of data collection included personal interviews with the lecturer and 3 students who had not previously participated in the focus group. Data from the focus group and personal interviews was compared with the questionnaire data. The needs analysis questionnaire was conducted at the beginning of the

semester. The ePortfolio task questionnaires were conducted at the end of each task, after formative feedback and results were issued. The focus group and interviews were conducted during the last week of the semester. Brand Management was the final module that students had with the lecturer in year 4.

Ethical approval was sought and received from the Research Sub-Committee for Academic Council in ATU prior to the commencement of data collection and analysis.

4.   Design of the New UDL Module Assessment.

The UDL ePortfolio assessment is part of a brand management module (5 credits), which is delivered in year 4 of the BBS (Honours) in Marketing and Sales programme. It is worth 40% of the overall module marks. A draft ePortfolio plan was presented to the students at the beginning of the semester. Students suggested that there were too many tasks in the original plan and suggested other options for action and expression. The revised plan which was agreed by the students and the lecturer is outlined in Table 1. It reduced the number of tasks to five and incorporated more choice.

Table 1: Revised ePortfolio Design Plan

Component	Options	UDL principles applied	%
Bio (Biography) Individual task.	Introduction about yourself/ you as a brand and your goals for the year. This can be completed using photos and text OR create a video. Add to your e-portfolio.	Multiple means of engagement: choice of how a student engages, authentic.	6
		Multiple means of action/expression: choice of how they express their learning.	
Interview/ Discussion Working in pairs.	Ask three consumers about their brand loyalty in the following categories: toothpaste, shampoo, cereal, and ice-cream. You can submit a video, Microsoft teams recording or an audio file of your findings. Add to your e-portfolio.	Multiple means of engagement: integrating life experience/real world, choice of engagement, engaging with peers.	6
		Multiple means of action/expression: choice of how they express their learning. Multiple means of representation: scaffolding learners use of technology to enhance their learning.	
Social Media Individual task.	Source a brand article, discuss on twitter, comment on a peer's post. Add the article link on your e-portfolio, reflect on how the article links back to the theory covered in lectures.	Multiple means of engagement: integrating real world examples, active learning through engagement with peers and the wider community, self-reflection of content.	6
Brand Audit Group project.	Reflect on the brand audit group project which you peer assessed. Add the completed rubric to your e-portfolio and consider your experience of the process.	Multiple means of engagement: integrating real world examples, group work, peer assessment, peer discussion.	12

	Digital badge award for most popular project as marked by peers.		
e-Portfolio design and content Individual task.	Final review of e-portfolio. Digital badge award for best ePortfolio.	Multiple means of engagement, representation, and action/expression. Students are assessed along the way, and they now refine their work based on the feedback provided at the end of each task. They represent how they have learned and what they have learned through the e-portfolio. They carry this with them to future employment and can add to it later.	10

5.   Research Findings and Analysis.

The following is a distillation of the main findings of integrating a UDL approach into the Brand Management module in ATU using an ePortfolio, from a student perspective.

5.1 Needs Analysis.

A needs analysis was conducted at the beginning of the semester to assess student needs in relation to UDL and ePortfolios. 92% of students had never heard of UDL before and only 2% agreed that they had some knowledge of ePortfolios. However, the majority of students (53%) stated that they had completed reflective writing exercises at some stage in their degree. The majority of students indicated that they would like a choice in the way they would be assessed.

70% of student responses felt that groupwork is important for their learning but less of them (62%) agreed that they enjoyed groupwork on projects. Similar themes in relation to groupwork and collaboration were presented in the research of Katz (2015), and Rao et al., (2021).

Many students (80%) thought that assessment should be linked with what was happening in the real world. This reinforces the research by Tobin and Behling (2018) where students wanted the opportunity to show what they know in real-life settings.

76% of students surveyed felt that the use of technology in assessment enhanced their learning. This result is similar to the findings of Basham et. al (2020) that integrating technology can maximise student learning.

Separate surveys were conducted in relation to each ePortfolio task during the semester i) Bio, ii) Interview, iii) Social Media and iv) Peer Assessment Reflection.

5.2 Bio Task.

In relation to the multiple means of expression offered in the Bio task, results indicate that most students chose text and photos to represent their Bios as illustrated in Figure 2.

<u>Figure 2: Bio: Multiple Means of Expression.</u>
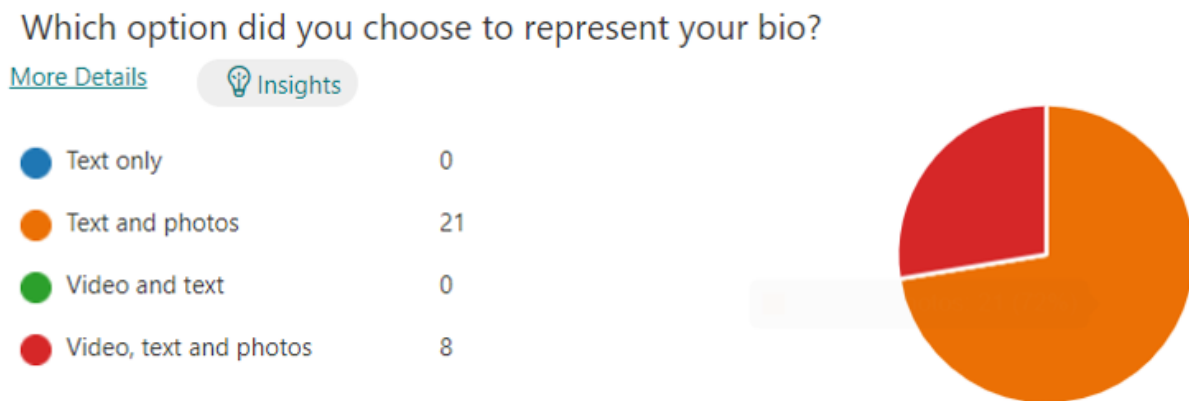
Students commented that they found the combination of text and photos more visual than text only and it was perceived as easier to do than video. In the focus group, Student D suggested that they used video because they felt that it expressed their personality more. In a personal interview, Student K stated "*I have low concentration levels, so I prefer looking at pictures. I was able to express myself most through this option.*" This reinforces the research findings of Lawrie et al., (2017) in relation to students not having to take a task type that might disadvantage them.

In relation to engagement, most students surveyed found the Bio task engaging as illustrated in figure 3.

Figure 3: Bio: Multiple Means of Engagement.

Student B in the focus group suggested that they found it engaging because they could express themselves the way they wanted "*gives you the choice to put your own twist on it*." In a personal interview, student J felt that it was engaging because they hand never done an ePortfolio before. They suggested that it was "*more exciting*," "*unique*" and something they could continue to build on. 90% of students who completed the questionnaire agreed that the Bio task was a useful learning experience relevant to the skills required after they graduate from their degree.

5.3 Interview Task.

In relation to the interview task, most students used a Microsoft Teams recording (57%) to complete the task as illustrated in figure 4.

Figure 4: Interview task: Multiple Means of Action and Expression.

Which of the following options did you choose to express your learning?

More Details   💡 Insights

🔵 Audio   12
🟠 Video   2
🟢 Teams recording 18

Student 23 who completed the questionnaire suggested that "*the teams recording seemed like the most efficient way to get our interview done without having to spend a lot of time chopping and editing voice recordings*". Student 24 who completed the questionnaire stated, "*I recorded the interviews on my phone as I felt it was the easiest way because the participants were in the same room*". Student 10 who completed the questionnaire felt that they wanted to challenge themselves and learn how to use the audio software demonstrated in class, so they chose the audio option. In the focus group, student C stated that they chose audio because the interviewees did not want to appear on video. These results reinforce the research by CAST (2018), Carrington et al., (2020) and Tobin and Behling (2018) that students demonstrate their capabilities in different ways and there is not one means of engagement that will be optimal for all learners in all contexts.

Most questionnaire respondents (85%) suggested that working in pairs made the interview task more engaging and that the use of technology in this task enhanced their learning (91%). However, in the focus group, student D suggested that the task would have been easier to complete individually as only one person would have to edit the audio in the Adobe Audition software. In a personal interview, student J commented that the Adobe Audition software looked too complicated, and they were more familiar with an audio app on iPhone. In a survey response, student 12 commented "*The interview task for the ePortfolio was quite challenging for our pair, as we had to do it remotely and the Wi-Fi was bad. We were anxious in front of the camera and had to record it over and over again, very frustrating and tiring*".

94% of students surveyed indicated that interviewing consumers in this task helped them relate

brand loyalty to the real world. This finding supports the notion that relating learning to the real world and making it authentic can increase engagement (Corley and Zubizarreta, 2012, Tobin and Behling, 2018, Rao et al., 2021).

5.4 Social Media Task.

In relation to the social media task, most students who completed questionnaires (94%) agreed that the social media task enabled them to participate with a wider community. In a personal interview, student K commented that they reached out to classmates who they would not normally engage with. In the focus group, student F recommended that the article should be posted on both Twitter and LinkedIn as this is where the prospective employers would be, and the student would be conscious of being professional in their posting. Other students in the focus group agreed with this suggestion. They also commented that it was useful to have a repository (#brandmanagement2021) of over 50 branding articles to refer back to for other modules or assessments.

81% of students who completed questionnaires found the task engaging. In the focus group, student B mentioned that it was engaging because it combined research, reflection, discussion, and collaboration with peers. Student A in the focus group commented that they liked the flexibility of being able to choose a brand article they were interested in rather than a prescribed one. In a personal interview, student I commented that it they read and responded to more than one article. The social media task encouraged collaboration as suggested by Bronseth and Hebert (2019).

The majority of students who completed questionnaires (59%) felt that they had reflected on the content of the article in their ePortfolio and linked it back to the theory covered in class. The marks awarded to students for the reflection part of this task support this finding.

5.5 Peer Assessment Task.

In relation to peer assessment, 96% of students surveyed indicated that they felt that their contributions mattered, and that peer assessment encouraged them to reflect more on their own projects. In a personal interview, student K stated that when they saw what others did well, they wondered if they could have done better in their own project. This supports the research of

Farrell (2019) and Scully, O'Leary and Brown (2018) where ePortfolios contributed to the development of reflection skills. The peer assessment task gave students ways to see and hear what peers were doing and saying about a topic and to give feedback to each other as suggested by Rao et al., (2021).

All students surveyed stated that the rubric provided by the lecturer gave clear guidance on how to mark a peer's work and 88% suggested that the peer-to-peer learning was engaging. In the focus group, student E commented that they found it difficult to mark someone else's work but that the rubric helped. This highlights the importance of scaffolding as suggested previously by Cook and Rao (2018) and Rao et al. (2021). In a personal interview, student I stated, "*I wanted to mark it fairly as that's how I wanted mine to be marked*." All students surveyed suggested that it was a good idea to use anonymous marking in relation to the peer assessment. Student 2 who completed the questionnaire stated that if the peer assessment was not anonymous, it would cause friction and they did not want conflict with classmates. Student 11 who completed the questionnaire indicated "*It is a valuable experience because it gets you to really learn to analyse and give your opinion. With it being anonymous makes the grading a lot easier because you don't feel that you are offending anyone*". In a personal interview, student K suggested "*there is less guilt if it is a friend's project that you are marking and give it a low mark*". The next section of this paper summarises key research findings, highlights the most significant conclusions and makes recommendations arising out of the research.

6.   Conclusions and Recommendations.

The purpose of the study was to critically evaluate the integration of a UDL approach into a brand management module in ATU using an ePortfolio, from a student perspective. In the areas of multiple means of engagement and multiple means of action and expression, the integration of a UDL approach using an ePortfolio has proved a useful experience for students in this study. It provided them with opportunities to choose their own learning paths and connect with course content, which has been highlighted in the past by Boothe et al. (2018). Despite the lack of awareness of UDL and ePortfolios among students at the beginning of the semester, students embraced the choices provided through the ePortfolio tasks and expressed themselves in unique ways to show their potential. Therefore, a UDL approach can provide flexibility for students in demonstrating their capabilities in different ways as highlighted by previous scholars (Carrington et al., 2020; CAST 2018; Tobin & Behling 2018). In the next iteration of the module,

a choice of tasks will continue to be offered and the percentage weighting of the ePortfolio will increase from 40% to 60%. This will allow students to consolidate more of their learning.

Students recognise the importance of groupwork in their learning, but fewer agree that they enjoy groupwork on projects. However, overall, there were positive results relating to the collaboration aspects of the interview task and the group peer assessment. These results highlight the importance of choice in relation to who they collaborated with on tasks and the importance of a well-structured rubric which helped the peer assessment task. Anonymous marking was also seen as crucial to the peer assessment process. In the next iteration of the module, peer assessment will be extended to other ePortfolio tasks.

The ePortfolio tasks were linked to what was happening in the real world and this engaged students, particularly through the interviewing of consumers and communication with a wider network through social media. As highlighted in research by Tobin and Behling (2018), students wanted the opportunity to show what they know in real-life settings. Relating the ePortfolio assessment tasks to the real world helped them analyse and reflect on what they had learned about branding. In the next iteration of the module, tasks which combine research, reflection and discussion in real-life settings will be expanded to include prospective employers and industry practitioners.

In relation to the use of technology/digital tools in UDL, this study illustrates that it does engage students and provides them with many options to express themselves and integrate their learning. This is similar to research by previous scholars (Morreale et al., 2017). The concept of an ePortfolio was new to the students and they explored many options for its use. They felt it was something they could build upon, even after leaving college. Students varied in their approach to using technology for the ePortfolio tasks. Some chose on the basis of what was perceived to be the easiest option although others wanted to try the new technologies that had been demonstrated in class. This flexibility allowed them to choose their own learning paths.

Offering choice is beneficial and engages students but software should be perceived by students as easy to use and not a barrier to learning. For example, in the interview task, scaffolding was provided to the students in the form of training in Adobe Audition which is a stand-alone audio editing and sound-mixing software programme. However, few students used it and opted for software and apps that they perceived as easier to use or software that they were already familiar with. The scaffolding provided for the interview task was not effective for all the students and this negated the positive impact of scaffolding as highlighted by previous

scholars (Cook & Rao, 2018; Rao et al., 2021). The students could have experienced technology overload as highlighted by Yin et al., (2018).

Technology should be reviewed in each iteration of the module, ensuring that it aligns to the learning outcomes so that learners can build connections and enhance their learning. The use of Pebblepad as an ePortfolio platform was positive, particularly because of the combination of research, reflection, discussion and collaborate in one space but also because students bring the licences with them when they leave college. Provision for the cost of licences should be considered at institute level to ensure that the budget continues to include such ePortfolio platforms.

Overall, the student response to the UDL approach through an e-Portfolio was positive. From a lecturer perspective, I found it a rewarding experience. Students like choice, not just in the co-design of assessment tasks but also in the way they participate in class, present their views, and communicate with the lecturer. One of the learnings for me was comments from many students in relation to my teaching approach. They view me as approachable, helpful, enthusiastic, and fair. They feel that this encourages them to try new ways to learn because they trust the person and the process.

Other important recommendations arise out of this study. In each iteration of the module, a needs analysis of the cohort of students should continue to be carried out at the beginning of the semester. This had a major influence on the UDL assessment design implementation using an ePortfolio in this study. Involving students in the design gave them a sense of ownership and they had many innovative ideas in relation to choice of expression and engagement.

It would be beneficial to students if the integration of UDL using ePortfolio was implemented at an earlier stage in their programme of study. This study introduced it in year 4 of the honours degree so students who graduated after year 3 did not have the opportunity to experience it. A recommendation for future iterations is to implement the approach in year 3 or earlier so that students can see how they are developing over the duration of the programme. It could also be implemented across modules.

Further studies in the area of UDL using an ePortfolio could include more implementation research from specific fields. Additional studies could also examine class size in relation to approach adopted. Is there an optimum class size for integrating a UDL approach using an ePortfolio? Would the research results differ if the same strategy was implemented for a larger cohort of students on a higher degree programme?

This case study has provided in-depth information in relation to the integration of a UDL approach using an ePortfolio into one module in ATU. In this iteration, applying the UDL principles, enabled by digital technology, has been perceived by students as engaging and motivating. Students embraced the flexibility of choices offered through the range of ePortfolio tasks, and expressed themselves in unique ways, both individually and in groups.   They developed their reflection skills and took more autonomy over their own learning through peer assessment.

Results are not generalizable from a scientific perspective, but this was not the purpose of the study. It has provided a descriptive account of one cohort of 56 students on the BBS (Honours) Degree in Marketing and Sales, experiencing a UDL learning approach through an ePortfolio for the first time. Learnings from this study can contribute to the knowledge among lecturers in other schools and institutes who would like to implement a similar learning approach.

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Appendix 1 Questionnaires for ePortfolio Tasks.

ePortfolio Task 1: Create ePortfolio and Bio Page

1. Which option did you choose to represent your bio?

   ○ Text only

   ○ Text and photos

   ○ Video and text

   ○ Video, text and photos

2. Why did you make this choice?

   > Enter your answer

3. By completing the BIO task, do you think it was useful learning relevant to the skills required of you once you have finished your honours degree?

   ○ yes

   ○ no

4. Did you find the task

   ○ Challenging

   ○ Boring

   ○ Not relevant

   ○ Engaging

5. Did you prefer to have a choice on how you expressed your learning?

   ◯ yes, I like having the choice on how I present it

   ◯ no, just tell us one way you want us to present it

ePortfolio Task 2: Interview in Pairs

1. Which of the following options did you choose to express your learning?

   ◯ Audio

   ◯ Video

   ◯ Teams recording

2. I chose this method because

   Enter your answer

3. Working with another classmate made the task more engaging.

   ◯ Yes

   ◯ No

4. Interviewing consumers helped to relate brand loyalty to the real world.

   ◯ Yes

   ◯ No

5. The use of the technology in this task enhanced my learning.

   ◯ Yes

   ◯ No

6. I found the task

○ Challenging

○ Unnecessary

○ Engaging

○ Not relevant to learning outcomes

7. Did you use Adobe Audition as part of your task?

○ Yes

○ No

8. If no, why?

Enter your answer

ePortfolio Task 3: Social Media – Research, Discussion and Reflection

1. How did you decide which article you would use for this task?

Enter your answer

2. How did you decide which post to respond to?

○ Interesting Article

○ My friend posted it

○ It was posted the same date as mine

○ It was a brand I have an interest in

3. In my ePortfolio, I tended to describe the content in the article rather than reflecting on its relationship to module content covered.

○ Yes

○ No

4. This task enabled me to participate with a wider community/network.

○ yes

○ no

5. I found the task

○ Challenging

○ Engaging

○ Not relevant to learning outcomes

○ Not necessary

ePortfolio Task 4: Peer Assessment

1. I feel that my contributions mattered in the peer assessment.

○ yes

○ no

2. The rubric provided to us by the lecturer gave clear guidance on how to mark the peer's work.

○ yes

○ no

3. The peer to peer learning was engaging.

○ yes

○ no

4. Peer assessment encouraged me to reflect more on my own project.

○ yes

○ no

5. I found it difficult to make judgements about the work of my peers.

○ yes

○ no

6. Is it a good idea to used anonymous marking in relation to peer assessment?

Enter your answer