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Live brief projects in higher education: a contextualized examination of student and staff perceptions of experiential learning

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*A thesis submitted in partial fulfilment of the University's requirements
for the Degree of Doctor of Education*

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**Buckinghamshire New University
Coventry University**

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Abstract

In a context that privileges the development of cognitive measurement, the aim of this research is to examine students' and staff perceptions of an experiential project in higher education in conjunction with intended learning outcomes. Supported by staff, undergraduate students involved in the research worked in cross-disciplinary groups on a live brief, where an agreed outcome was produced for an external client.

An interpretivist qualitative methodology brought together data from two sources: module descriptors and twelve focus groups involving 47 student and staff participants who had taken part in the experiential live brief project. Module learning outcomes were analysed in terms of their alignment with domains from two different taxonomies: Anderson's *Taxonomy for Learning, Teaching and Assessing* (Anderson *et al.*, 2001), also known as 'Bloom's', and an alternative taxonomy, *Atkinson's Taxonomy Circles* (Atkinson, 2013). Focus group transcripts were analysed using Contextual Text Coding (CTC).

Juxtaposed, the results of analysis suggest a discrepancy between intended module learning outcomes and students' and staff perceptions of value and learning. The affective domain is not represented in any of the intended learning outcomes, yet the analysis of the focus groups indicates that this is the greatest area of reported learning. As well as showing changes to values and attitudes, students and staff reported that they appreciated the authenticity of experiential learning to develop students' soft skills, including teamwork.

The unique contribution of the thesis is the juxtaposition of the perceptions of students and staff who have taken part in an experiential learning experience with intended learning outcomes. In doing so, the research has highlighted the shortcomings of traditionally formed learning outcomes in capturing learning that fits contemporary expectations of students' development through higher education study. Findings support existing literature that experiential learning using live briefs, carefully implemented, affords rich opportunities for learning that students and staff see as valuable. Importantly, too, the development of a wider range of learning and skills aligns with the sector's priorities if not the systems that underpin them. The type of learning and unpredictable nature of live briefs should also be considered in a sector where systems favour cognitive learning and metrics are important.

Furthermore, the comprehensive consideration of core theory facilitated through the literature review, namely Bloom's Taxonomy as it is understood through the work of Anderson *et al.* (2001) as a model to plan and design learning is shown to limit opportunities for learning that extends beyond the cognitive domain. This examination grounds the observations of other researchers who have noted shortcomings of Anderson *et al.*'s (2001) work.

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Author's Declaration

I declare that this thesis and the work presented in it are my own and have been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University.
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated.
3. Where I have consulted the published work of others, this is always clearly attributed.
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work.
5. Where elements of this work have been published or submitted for publication prior to submission, this is identified and references given at the end of the thesis.
6. This thesis has been prepared in accordance with Coventry University and Buckinghamshire New University regulations.
7. I confirm that if the submission is based upon work that has been sponsored or supported by an agency or organisation that I have fulfilled any right of review or other obligations required by such contract or agreement

Rebecca Rochon

1 Introduction: the growing accountability of higher education

Learning that occurs ‘through the transformation of experience’ (Kolb, 1984, p. 38) can be classified as experiential learning. Live briefs are a particular type of experiential learning where students are supported through their university to work on a real world project involving a client or user; the ‘brief’ is negotiated between student and client as opposed to communicated by the academic (Sara, 2011).

The aim of this research is to examine students’ and staff perceptions of an experiential project in higher education in conjunction with intended learning outcomes.

As professional doctorates are rooted in both the profession and the academic discipline (QAA, 2020), situating the thesis within the greater context of higher education provides opportunities for a reflexive discussion of key issues that have informed the research in order to build the rationale. The introduction of the thesis situates the research within five different contexts. These contexts are seen to ground all research: national, professional, theoretical, policy and organizational (Plowright, 2011).

1.1 National context

The national context is arguably the most significant, because it affects the role and operation of universities, staff and students.

Higher education (HE) in the UK has experienced a period of significant change over the past three decades, marked by the introduction of the Further and Higher Education Act in 1992. This led to the formation of new ‘post-1992’ institutions, increasing the number of universities significantly. Once seen as having intrinsic value, higher education was suddenly expected to demonstrate its worth (Clark, 2003). Universities began to experience increasing scrutiny and public expectations of accountability (Hooker, 1997; Strathern, 1997; Huisman and Currie, 2004). Several developments have driven the emphasis on accountability for higher education and emphasized the role of universities from places of research and dissemination to places of learning and teaching. These developments include the introduction of national frameworks for assessing research and teaching quality, the Browne Review of 2010, and a shift in the priorities of governing and monitoring organizations.

1.1.1 Frameworks for accountability: the RAE/REF and TQA/TEF

Increased accountability was already part of the national agenda when the Further and Higher Education Act came into being in 1992, but it was still a relatively recent arrival. What are now recognised formal quality assurance systems were introduced in universities between 1984- 1986 (Society for Research into Higher Education, 1994). The Research Assessment Exercise (RAE), first undertaken in 1986 (Research Assessment Exercise, 2008), made it one of the first transparent and public exercises of accountability for universities. Recognition of the importance of teaching in universities came shortly after. The Teaching Quality Assessment (TQA) was introduced in direct response to the Further and Higher Education Act in 1992 (Higher Education Funding Council for England, 2001a). Both the RAE and TQA responded to demand for accountability by providing metrics against which universities could be assessed. Their current equivalents, the Research Excellence Framework (REF) and the Teaching Excellence and Student Outcomes Framework (TEF), have the same intent. A brief overview explains the purpose of each, and their roles in driving the rise of metrics intended to indicate performance.

Research Excellence Framework

As noted, using metrics to capture the value and impact of research activity was formalized through the REF's predecessor, the Research Assessment Exercise (RAE). The purpose of the RAE was 'to enable the higher education funding bodies [...] to distribute public funds for research selectively on the basis of quality' (Higher Education Funding Council for England, 2001b). The RAE's implementation was, however, criticized for its perceived role in perpetuating the channeling of funding to a small number of elite universities and failing to value applied research (Barker, 2007).

Introduced in 2014, the first of the REF objectives is 'accountability' (Research England, 2021). The REF has been similarly viewed as inadequate in providing an accurate representation of research excellence through metrics and, paradoxically, burdensome in process (Stuart, 2015). The REF requires universities to compile metrics including publications, 'impact' as determined by the reach of the publication and subsequent application. Given the relationship between research quality as determined by the REF and funding, the REF is associated with a 'metric tide' across the HE sector that encourages a

gamified use of data that has been manipulated to provide a distorted view of actual performance (Wilsdon *et al.*, 2015).

Teaching Excellence and Student Outcomes Framework

Just as the RAE became the REF, the TQA has become the TEF. When it was piloted in 2016, the framework was simply the 'Teaching Excellence Framework', or TEF. It was quickly seen that in order to be meaningful, the framework would necessarily show an impact of teaching on students' learning. Accordingly, the framework's name was modified to refer explicitly to 'student outcomes', as in, the 'Teaching Excellence and Student Outcomes Framework', although is still commonly referred to as the TEF (Office for Students, 2021a).

Between 2016 and 2019, HEIs participating in the pilot TEF completed a submission that addressed three areas of practice, using criteria set out by the Department for Education: teaching quality, learning environment, and student outcomes and learning gain (Department for Education, 2017). The latter was considered the most problematic because the concept 'learning gain' was, for the first time, considered a key metric.

Learning gain may be broadly described as the knowledge, skills and competencies developed as part of a course of study. The earliest models of learning gain measurement (still in use today), quickly recognised that pre-existing knowledge should be taken into account so that the value added could be viewed separately from the final outcome (Hovland, Lumsdaine and Sheffield, 1949). It is seen as the 'the difference in student performance between two stages of their studies [...] or simply as 'learning'' (Hoareau Mcgrath *et al.*, 2015, p. xi). It is the notion of value added that separates learning gain from end-point achievement as a way of determining the effectiveness of the learning experience.

More recent definitions of learning gain in higher education emphasise breadth and highlight that it continues to evolve. Several years ago, the Higher Education Funding Council for England (HEFCE, now the Office for Students) described it as 'changes in knowledge, skills, work-readiness and personal development during a student's time in HE' (HEFCE, 2018, p. 6). A more recent report produced for the Office for Students defines learning gain as 'as the change in knowledge, skills, work-readiness and personal development, as well as enhancement of specific practices and outcomes in defined

disciplinary and institutional contexts' (Howson, 2019, p. 5). These definitions, and the differences between them, underline the complexity of learning gain and underline the absence of an agreed definition.

The TEF pilot recognised that there was no agreed way of capturing learning gain as a metric. The Department for Education acknowledged the absence of measures that are considered 'robust' and 'applicable for all types of providers' (Department for Education, 2017). Each HEI participating in the TEF was left to define their own measures within their submission.

In an attempt to develop robust and credible measurements for learning gain, there has been a significant investment of public funds. Key funded projects included the 'National Mixed Methodology Learning Gain' project, which set out to identify a way to measure learning gain over time (Office for Students, 2021d) and the 'Higher Education Learning Gain Analysis' (Office for Students, 2021b) which looked at whether existing data could be used to provide insight into learning gain. Perhaps the largest, however, was the investment into pilots in 2015, the Higher Education Funding Council for England (HEFCE, now the OfS) funded a series of projects across 70 universities in the UK (Office for Students, 2021c) at a cost of over £4 million pounds (Randles and Cotgrave, 2017). Together, these projects highlighted the challenges and complexities of capturing learning, and the OfS has indicated that it is 'taking stock of the findings from the evaluations of each strand' but no further research is currently planned (Office for Students, 2021d, 2021b, 2021c).

In the absence of definitive guidance on the measurement of learning gain, a final evaluation report of the funded pilot studies provides the most significant recommendations. Following a review of nearly 30 approaches to measuring learning gain piloted, a key recommendation is that measurements must recognise different dimensions of learning beyond the cognitive, or knowledge-based dimension. The final report on learning gain projects recognised the complexity and diversity of student learning; accordingly, 'multiple measures of learning gain are necessary', seen to include affective, or attitudinal and value-based learning (Howson, 2019, p. 19). These findings were similar to an earlier report on learning gain, the *RAND report on Learning Gain*. Importantly, findings from the latter highlighted the potential to gamify metrics, as well as urging caution in attempting to implement standardization for a process with a number of qualitative

elements of learning, as there is a risk of disrupting effective practice in the process (Hoareau Mcgrath *et al.*, 2015).

In practice, measurement of the cognitive dimensions of learning dominates higher education. A large-scale review of literature by Rogaten *et al.* (2018) analysed studies of learning gain in higher education to determine how learning gains were empirically measured. The review observed variation in approaches to measuring gain but emphasized that most studies focused on measuring cognitive gain, and the fewest studies focused on affective learning gain. The review concluded with the recommendation that there is an urgent need to develop policies and approaches to measurement in the affective area (Rogaten *et al.*, 2018).

A review of the TEF itself concluded that although 'educational gains' should continue to feature as a key metric, the current TEF lacks transparency and consistency in these measures (Pearce, 2019). In the light of this and other shortcomings, a new framework is under development, set for consultation in 2021 (Office for Students, 2021a) with the proposed name of 'Educational Excellence Framework' (Pearce, 2019). Its proposed introduction highlights both the challenge of capturing metrics related to learning and teaching as well as a subtle change from a focus on teaching to a focus on education and learning.

1.1.2 The Browne Review

Almost twenty years after the Further and Higher Education Act in 1992 the UK, the Browne review, an independent review of higher education, was published and was soon considered instrumental to drawing learning and teaching into focus and highlighting accountability. Although another significant review, the Dearing Report, had pointed to the 'importance of the development of teaching as a profession' (National Committee of Inquiry into Higher Education, 1997, p. 215), it is suggested that prior to this time, there was almost no attention to the development of academics as teachers (Blaxter, Hughes and Tight, 1998). The Browne Review also drew increased attention to accountability for public funds, and this coincided with shifting perception of students from learners to customers (Jones, 2010).

The Browne Review formed its recommendations around core principles in relation to a number of areas: investment, student choice, access, repayment of loans and support for different modes of study (Browne *et al.*, 2010). The Browne Review was seen to increase

competition, contributing significantly to the marketisation of higher education and bringing the student voice, via the National Student Survey, to the forefront (Harding, 2012).

It is useful to note that the national picture of change and increasing accountability reflected a global one during the same period. The United Nations Educational Scientific and Cultural Organization (UNESCO) recognised the impact of globalization and massification where the purpose, role and operating procedures were being reconsidered globally, requiring new ways of working across higher education (Altbach, Reisberg and Rumbley, 2009). At the same time, an international review concluded that that the activities of measuring performance in HE were increasingly widespread and largely imperfect (Australian Learning and Teaching Council, 2008).

In the UK, among other types of impact, the Browne review acted as a catalyst for a rapid shift in the identity of academics, from that of subject matter experts and researchers to professionals in teaching and learning. In doing so, it highlighted the role of academics and their accountability in the learning process.

1.1.3 The QAA, OfS, NUS and FHEQ

The main organizations and frameworks for higher education in the UK are essential in defining the national context for the research: QAA, the OfS, the NUS and the FHEQ. A brief overview highlights some of the contemporary features of higher education supported by these, including students as stakeholders, the importance of a learning experience that supports inclusivity and is accountable, and the commitment of higher education to produce employable graduates. Effectively, these organizations set out the guidance and frameworks to which universities are held accountable.

The Quality Assurance Agency, who monitor universities in the UK, set out expected standards of operation in the Quality Code. As the name suggests, the emphasis is on quality and standards. However, alongside the Browne review, the QAA narrative has increasingly focused on the inclusion of students as stakeholders. This applies to the role of student both in the processes of learning as well as the processes that affect learning.

Together with the National Union of Students (NUS), the QAA suggests that there is a need to reconsider the way that students and institutions can work together to improve higher education (Streeting, Wise and Quality Assurance Agency, 2009). This demonstrated their

own commitment to the place and value of partnerships between students and staff. Partnership, according to the QAA, refers to 'joint working between staff [...]' with different levels of engagement expected depending on context (Quality Assurance Agency, 2011, p. 1). This statement was actioned through the introduction of a new chapter of the Quality Code: Chapter B5 on Student Engagement. Chapter B5 framed the role of students within the learning experience, explicitly citing partnership working as tool for the enhancement of students' higher education experience (QAA, 2012).

A similar appetite for an increased role in their education was expressed by students through the NUS, who worked to raise the profile of students as stakeholders in the learning process. They began working with the Higher Education Academy (now Advance HE) in 2010 to create a toolkit for engaging students as partners, and published a 'Manifesto for Partnership' in 2015 (National Union of Students, 2015).

The Office for Students (OfS), who regulate higher education in England, suggest that the purpose of universities is threefold: ensuring equality and diversity in participation in higher education; the provision of high quality education experience; and enrichment through the provision that demonstrates 'value over time' (Office for Students, 2021e). Each of these is very much focused on the learning experience of students. The OfS also commissioned the National Student Survey, the primary vehicle for students to provide feedback on their universities. This questionnaire currently asks 27 questions relating to student experience, the majority of which are linked to learning and teaching (Ipsos MORI, 2021) .

The Framework for Higher Education Qualifications (FHEQ) (Quality Assurance Agency, 2014) is the principal reference point against which higher education providers are required to set and maintain their academic standards. It forms part of the UK Quality Code for Higher Education, which defines expectations for all UK higher education institutions in terms of 'what they are required to, what they can expect from each other and what the general public can expect from them' (Quality Assurance Agency, 2014, p. 3). The FHEQ sets out the hierarchy of higher education qualification levels and describes in general terms the degrees of achievement that are expected at each level. The descriptors for each level take the form of a statement of outcomes which students should be able to demonstrate to be awarded the qualification and a statement of the wider abilities they should have developed. Typically, this is framed in terms of the range, depth and complexity of

knowledge, cognitive skills (analysis, evaluation, application) and more affective transferable skills (communication, problem solving and employability related skills) expected at each level.

Every descriptor in the FHEQ, from Level 4- Level 8, includes the statement that holders of a qualification at that level 'will have the qualities needed for employment (Quality Assurance Agency, 2014, pp. 21, 26, 28, 30).

1.2 Professional context

The professional context of the research is one where academics are expected to have sound knowledge and skills of learning and teaching, and increasingly in the effective use of metrics.

The professionalization of academics in higher education came into focus through the Browne Review, because funding was explicitly linked to the teaching qualifications of staff at universities. As per the report: 'all new academics with teaching responsibilities to undertake a teaching training qualification accredited by the HE Academy' (Browne *et.al.*, 2010, p. 45).

At the time of the Browne review, as now, there were two organizations dedicated to staff development in higher education: the Higher Education Academy (HEA), now Advance HE, which had previously been more student-facing, and the Staff and Educational Development Association (SEDA). Then, as now, SEDA offered awards for professional development in relevant areas such as external examination and research. SEDA is credited for having largely driven professional recognition within higher education (Wisdom, Lea and Parker, 2013). Following the Browne review, however, universities were largely driven to mapping their postgraduate teaching programmes against the UK Professional Standards Framework (UKPSF). Because it tied itself closely with the UKPSF, this largely consolidated Advance HE's status as the professional body for academics in higher education. The presence of a professional organisation is a significant marker for being defined as part of a profession (Neal and Morgan, 2000).

Unlike SEDA, who focused on a variety of areas for professional development, Advance HE is defined by the UKPSF, which relates almost entirely to learning and teaching. The UKPSF sees professionals in higher education as having three 'dimensions': areas of activity,

knowledge and professional values (Higher Education Academy, 2011). The five areas of activity relate almost exclusively to learning and teaching, with significantly less emphasis on research. My organization has had an accreditation scheme with Advance HE since 2014, and the postgraduate teaching qualification has been mapped to the UKPSF since this time. There is a research equivalent (VitaE), but its achievement is not a requirement for those teaching in HE.

Another noteworthy feature of the professional context both nationally and at an organizational level is a growing emphasis on academic proficiency in the effective use of data. The emergence of the Academic Professional Apprenticeship (APA) Standards in 2018 highlight the expectation that academics are able to demonstrate professional competency in using data. The Academic Professional is an alternative model for academics undertaking a teaching qualification, and is in practice co-taught with participants from a non-apprenticeship route. The APA Standards set out the knowledge, skills, values and behaviours of professional academics. One of the Core Skills is the requirement for academics to have 'complex information management and advanced digital literacy' demonstrated through engagement with metrics (Institute for Apprenticeships and Technical Education, 2018).

Further underlining of the importance of understanding the metrics of learning and teaching is seen in a QAA initiative. In 2020, the QAA launched a new project in the area of data and its use which emerged from growing recognition of the use of data in HE (Austen and Hallam, 2020) and the importance of 'data capability' for professionals (Quality Assurance Agency, 2020). This project is supported by a guide for academics to better help them understand and deploy data. The '*Staff Guide to Using Evidence*' has since been complemented by training across the UK in order to develop proficiency in analysing data and using it to frame institutional success (Quality Assurance Agency, 2021). At my university, several members of staff have undertaken the QAA training. Increasingly academics, myself included, have been encouraged to engage with dashboards used in conjunction with a variety of activities including recruitment and retention, evidencing that the national trend is being realized at a local level.

1.3 Theoretical context

The use of defined learning outcomes associated with Bloom's taxonomy (1956, 2001) and outcomes-based learning using constructive alignment are seen as key features of accountability (Bloxham, Boyd and Orr, 2011), and these provide an important theoretical context to the research.

A learning outcome is 'what a learner is expected to know, understand and/or be able to demonstrate after completing a process of learning' (QAA, 2018). Learning outcomes are the distillation of what learners should achieve within a programme of study, or, at a localized level, within a module. Most countries embed learning outcomes across higher education, and the consistency of this practice ensures recognisable transferability across programmes between institutions (Teresevičiene, Zuzevičiute and Hyde, 2007; Gudeva *et al.*, 2012; Havnes and Prøitz, 2016; Gurukkal, 2019). Effective learning outcomes make it clear what needs to be achieved, are appropriate to available time and resource, and measurable (Gudeva *et al.*, 2012). The latter is considered particularly important: 'Critical to writing effective learning outcomes is the use of specific and measurable verbs, avoiding verbs that are unobservable or unmeasurable and thus cannot be objectively assessed' (Newton, Da Silva and Peters, 2020, p. 1). This focus on the measurable shows what some believe is the behaviourist roots of outcomes-based learning, where only perceptible learning is valued. However, learning outcomes themselves may be ill equipped to provide a focal point for measurement. There is concern about the notable variation of the quality and consistency with which learning outcomes are written (Atkinson, 2015; Meda and Swart, 2018; Newton, Da Silva and Peters, 2020).

Outcome-based approaches, where learning activities are planned to enable students to meet defined learning outcomes, are central to the Quality Code for Higher Education (2018) because they are seen to support consistency of standards and support the effective design of delivery (Newton, Da Silva and Peters, 2020; Cleaver and Mclinden, 2021).

Learning outcomes stand both for what will be assessed and, where successful, accredited- in this way, they may be referred to as the 'starting point for a viable model for the curricula in higher education' (Allan, 1996, p. 93). Outcome-based approaches 'insist[...] upon determination of learning outcomes as the first step in course design' (Gurukkal, 2019, p. 1). Put differently, learning outcomes are the beginning of programme development, with

academics firstly considering what learners will achieve on completion of the programme, but also the end point of the learning journey, where these are assessed.

Bloom's (1956) Taxonomy, or rather the revised version of the taxonomy edited by Anderson *et al.* (2001), is considered 'ubiquitous' in higher education to facilitate the planning of learning outcomes (Newton, Da Silva and Peters, 2020, p. 107). Discussed in further detail in the literature review, Bloom's (1956) Taxonomy brought the concept of different domains of learning (cognitive, affective and psychomotor) into the mainstream. The revised version is primarily deployed as a tool for writing learning outcomes in the cognitive domain. As such, it is seen to prioritize attention to cognitive learning. In spite of this and other acknowledged shortcomings, the contribution of both the original and revised 'Bloom's to education cannot be overstated' (Marzano and Kendall, 2007).

A second major theoretical contribution to the design of learning in higher education is constructive alignment, seen to operationalize outcomes-based learning. Biggs (2003), who popularized the concept of constructive alignment in higher education, proposed a two-part theory. Firstly, learning is an active process; knowledge is constructed by learners as opposed to transmitted by a teacher. Secondly, in order to maximize the chances for learners to meet the intended learning outcomes, there should be alignment between the outcomes, the methods used to facilitate learning and assessment (Biggs, 2003a, p.2). As Biggs suggests, when applied correctly, 'the learner is in a sense "trapped, and finds it difficult to escape without learning what he or she is intended to learn"'

While accepted best practice as per the Quality Code, at a theoretical level, outcomes-based learning is seen to have a number of shortcomings (Havnes and Prøitz, 2016). Namely, these approaches are seen to:

- Fail to acknowledge serendipitous or unexpected learning
- Be incompatible with defining more abstract but equally valuable forms of learning
- Dissuade learners from contesting knowledge and
- Discourage meta-level learning

Put simply, those features of transparency, ensuring clarity of expectation and process that constructive alignment seeks to achieve are precisely what its critics find problematic.

Applied without consideration, outcomes-based learning and teaching deter the acquisition of knowledge or skills that are serendipitous or individualized.

While Bigg's framing of 'trapping' learners might be unfortunate, it would be an oversimplification to suggest that the spirit of the theory was intended to promote instrumentalism or reductionism through alignment. As Dewey suggests, the idea that learners will only learn the concept being studied is the 'greatest of all pedagogical fallacies' (Dewey, 1938, p. 48). Failing to capture or value learning that is not set out in the learning outcomes, however, is an ongoing challenge. The naming of *constructive* alignment highlights that Biggs was very much a constructivist. While there is a suggested paradox between having defined learning outcomes and constructivism (Havnes and Prøitz, 2016), there is no indication in the theory that learners should engage in a primarily knowledge-based curriculum that is studied and reproduced. Biggs is highly critical of 'the quantitative outlook [where] learning is conceived as the aggregation of content [and] to be a good learner is to know more (Biggs, 1994, p. 3).

1.4 Policy and organizational context

Policy and organizational context are treated together as this section engages with the policies in operation at my own university, a small post-92 university in the UK. There is some suggestion in research that students in England attending universities at the lower end of the league table, which would include my own, see higher education as playing an important role in improving employment outcomes and future earning (Brooks *et al.*, 2020). In this way, students share similar views to other stakeholders in terms of their expectation that University will equip them to both gain employment and succeed.

The development of 'work ready' students has been a sectoral priority since the Dearing Report (National Committee of Inquiry into Higher Education, 1997) and long been on the institutional agenda. In the past five years, 'work readiness' has become a more visible part of both policy and practice institutionally, again reflecting wider sectoral trends. The University introduced an employability initiative in 2019, ostensibly seeking to embed some form of work-related experiential learning in every course. The placement initiative operationalized the existing University policy, which stated that, 'all programmes will include elements of placement or work-based [learning]. This can be delivered through collaboration with external partners and employers or through internal mechanisms such as

simulation and live briefs' (Buckinghamshire New University, 2016). As a senior academic developer at the time, I was involved in curriculum development for the placement initiative, which was published on the website as a type of institutional promise before the curriculum had been developed. The placement strategy originated from a pedagogically-sound starting point in the policy; the fact that the initiative was marketed before the curriculum was fully realized reflects the reality of operating in a marketized environment. Rightly or wrongly, universities have been marketized and must make money to be sustainable (Molesworth, Nixon and Scullion, 2009).

The University's placement initiative is part of a wider sectoral movement to increase students' engagement with work-based learning as a means to foster the holistic development of cognitive knowledge and affective behaviours (Bandaranaike and Willison, 2015). It can also be seen as a vehicle to address the current mismatch between what employers see as desirable and universities are developing through their courses of study. While vocational courses, such as nursing or teacher training, embed the development of a wide range of skills beyond academic knowledge, there is a recognised shortcoming in many other courses for this type of skills development.

Reflecting practices in Europe, the Higher Education Achievement Report (HEAR) was proposed as a solution to encouraging and capturing a wider skills and experience set for students at university, such as extracurricular activities or voluntary work (Higher Education Achievement Report, 2015). The HEAR was to document a student's development 'more broadly and fully than the traditional academic transcript, and at the same time captures relevant information of interest to employers' (Universities UK & GuildHE, 2012, p. 4). The HEAR was never introduced in my institution, and when I enquired around the time that it was beginning to gain traction in the sector, I was told that we lacked the administrative resource to facilitate its implementation. Perhaps other universities faced similar resource issues, because HEAR has not seen significant growth and has been largely superseded by universities' uptake of promoting graduate attributes.

Graduate attributes are 'the distinctive qualities, skills and understandings that each university considers its students will have on successful completion of their studies' (Fry, Ketteridge and Marshall, 2015, p. 433). These capture what a university commits to offer all graduates, regardless of discipline (Gurukkal, 2019). Across HE, the concept of graduate

attributes has garnered both significant attention and adoption but there is real challenge in seeing these meaningfully embedded within the curriculum and its delivery (Hill, Walkington and France, 2016). At my university, the statement on graduate attributes says that these ‘focus on the development of innovative leaders in professional and creative capacities, who are equipped to operate in the 21st Century labour market and make a positive impact as global citizens’ (Buckinghamshire New University, 2020b). The development of these attributes involved significant consultation. While as academics, we tried to consider this pedagogically, the fact that this was also a marketing activity is undeniable. I do remember, for example, being asked about the ‘Unique Selling Point’ of the university as part of this consultation. As with the placement strategy, universities operate in a competitive environment and try to attract students accordingly.

In order to be effective, it is suggested that graduate attributes must be mapped into the curriculum (Bridgstock, 2009). The embedding of the graduate attributes within validated documents suggests that the University’s approach has some success: graduate attributes have become part of the curriculum development documents at programme and module level. Every learning outcome is ‘mapped’ into one of four categories of attributes: ‘(K) Knowledge and its application; (C) Creativity; (S) Social and ethical awareness and responsibility; and (L) Leadership and self-development’ (Buckinghamshire New University, 2020a). The embedding of attributes following validation is more limited, however, and these are not included in most student-facing documents, such as assignment briefs or module schemes.

The delivery and assessment of graduate attributes also presents a challenge for academics. While academics are generally seen to support the concept of graduate attributes, this does not consistently translate to reported practice (de la Harpe and David, 2012). This indicates the need for the development of academics to support the embedding of graduate attributes across learning and teaching. Having worked as a senior academic developer for several years, I would suggest that, in-house, little has been done in terms of raising other academics’ awareness of how the teaching or development and assessment of graduate attributes might look.

The institutional decision to become an apprenticeship provider is another significant part of the organizational and policy context. Again, this decision reflects a wider national

picture. Launched in 2015, degree apprenticeships presented both financial opportunities and the chance for universities to increase scope of their provision (Universities UK, 2017). These also introduced new ways of thinking about learning for many academics involved in the development of apprenticeships. Apprenticeship standards are grouped into the areas of knowledge, skills, values and behaviours. Apprenticeship programmes are mapped against standards, and one of the more significant challenges is to create learning outcomes that meet the requirement for 'values and behaviours', standards in the affective domain. While certain disciplines within my university, such as nursing, had for some time been mapped against the affective domain, the introduction of standards, which were then mapped to learning outcomes to develop the affective domain present a considerable challenge to even experienced educators. In 2018, I was part of a team tasked with the programme development and leadership of the Academic Professional Apprenticeship, which included the requirement for academic staff to 'the need to be enthusiastic, self-confident, and self-reflective to operate effectively in the role'. Not having written learning outcomes for work-based learning previously, I was significantly challenged by the limitations of Anderson's revised taxonomy (2001) in the development of affective learning outcomes.

1.5 Rationale

The five contexts discussed in the introduction provide a rationale for the research aim.

The national context for the research can be described as an 'ethos of measurement' (Spence, 2019, p. 773). Driven by government initiatives, metrics have emerged from the need for universities to demonstrate accountability through teaching quality and support informed student choice. The 'datafication of higher education' should not be viewed negatively as a whole, as metrics afford opportunities to enhance learning and teaching (Williamson, 2018). Learning gain is seen as an important but poorly defined metric, and existing research has highlighted the need to recognise different types of learning.

The national context has influenced professional expectations as academics, who must have both recognised proficiency in learning and teaching and who are increasingly expected to use metrics effectively to capture effective practice. This creates some tension because there is, from a theoretical perspective, an understanding that valuable aspects of learning may not be captured in metrics.

One of the most significant contributions to the theoretical context is Bloom's taxonomy, operationalized through Biggs' theory of constructive alignment. Together, these theories underpin the outcomes-based systems in higher education in the UK. While Biggs' stressed the constructive nature of learning, the application of constructive alignment risks being oversimplified in a climate where metrics are prioritized. Transparency risks excising some of the more valuable aspects of learning; it 'promotes instrumentalism' where teaching and learning process may become overly streamlined in a bid to perform well on what is measured (Torrance, 2007, p. 290). The widespread use of learning outcomes based on cognitive learning outcomes is insufficient to support the holistic development of students (Atkinson, 2013). Capturing experiential data that goes beyond the end product, that is, a graded result, is proposed as an appropriate counterbalance to the focus on end results (Beghetto, 2019).

At a local policy and organizational level, the embedding of policies and practices that place an increased emphasis on graduate attributes highlights the perceived lack of holistic development of existing programmes in developing different types of learning. The introduction of degree apprenticeships, too, highlighted a new type of learning and teaching for many staff including myself, in the area of values and behaviours.

Within these contexts, alternative forms of teaching including experiential learning are potentially at risk. Outcomes-based learning involves students carrying out tasks that are pre-determined by academics, but experiential learning necessarily involves unknowns, is responsive and ultimately unpredictable (Fitch, 2011; Scott, Penaluna and Thompson, 2016). There is recognition of the potential of authentic experiences to offer meaningful learning, but the complexities of these real-world situations are difficult to capture using existing strategies (Serrano *et al.*, 2018). Experiential learning acknowledges that learning outcomes can be planned or unplanned and that the skilled educator should support both (Beard and Wilson, 2002). Together, these facts mean that it is potentially uncomfortable for academics, as there is a perceived tension between recognising educational worthiness and its measurability.

As a type of experiential learning, live briefs are in keeping with the sectoral and institutional priorities of developing students' work-readiness. Their participatory design further means that live briefs support the current ethos of partnership valued by the QAA

and, indeed, other key organizations across the sector, including JISC and SEDA. However, while offering significant opportunities for students' learning and development, live briefs require significant resource to organize and facilitate, with less control over the outcome (Chiles and Till, 2004; Sara, 2011; Christiansson, Grönvall and Yndigegn, 2018).

For some time, support for innovation in learning and teaching in higher education has been observed to be 'fragile' (Hannan and Silver, 2000 cited in D'Andrea and Gosling, 2005, p. 15). Within this climate, there is legitimate concern that the privileging of metrics undermines the holistic development of students, because systems favour more visible but superficial indicators of quality in learning and teaching (Spence, 2019). 'At a time when there is increasing pressure on teaching academics to produce measurable results, resource-heavy innovative practice may be side-lined in favour of less resource-intensive approaches that provide similar metric-friendly outcomes' (Rochon and Knight, 2019, p. 20). Seen in the wider contexts examined in the introduction, these concerns, provide a rationale for the research aim.

1.6 Research aim

The aim of the research is to examine students' and staff perceptions of an experiential project in higher education in the context of intended learning outcomes.

The aim positions this as explanatory research, a type of investigation that looks beyond descriptive findings to scrutinize deeper connections, and examine the associations between what exists (Ormston *et al.*, 2014). The examination of students' and staff perceptions provides insight into what key stakeholders in experiential learning believe has been learned, what they value and the challenges that they have faced when engaging with a live brief. Juxtaposing stakeholders' perceptions with the intended learning outcomes contextualizes their views in relation to intended learning and facilitates a wider discussion in relation to existing literature and sectoral practices.

1.6.1 The live brief and my own role

Given the breadth and complexity of the research process, it is important to establish a clear sense of what actually took place. This section describes the live briefs that provided the basis for the research. I also clarify my own role as an insider researcher and how it relates to reflexivity in the research process.

The vehicle for the research, or 'case' as discussed in the methodology, consists of two cycles of implementing live brief projects at a small post-92 university in the UK. Each cycle involved different cohorts of students who participated in the live brief, and this activity formed the bulk of the taught element module work over one semester (c. 14 weeks).

The live briefs emerged from a relationship between a local council and the University. Aware that the University offered Computing courses, the council asked for help in the development of two different app prototypes:

Year 1 live brief: propose a prototype to meet defined parameters in the creation of a 'Heritage Trail' app to help locals and visitors to the area navigate to different parts of the town centre.

Year 2 live brief: propose a prototype to meet defined parameters in the creation of an app dedicated to 'Safe Spaces' in the town centre.

Staff from Computing realized the project would require expertise beyond their own discipline. Computing academics involved those from Creative Arts to discuss how the project could be taught using a cross-disciplinary approach and still meet intended module learning outcomes for the modules concerned.

Over the two years of the project, students from four different courses were involved: Computing, Graphic Arts, Illustration and Creative Design. Students and staff from the latter group are referred to as 'Creative Arts' students throughout this thesis. While expediently grouping these disciplines misses the 'nuance, difference and particularity' of the programmes, there is a case for doing so where it affords a streamlined discussion (James, 2017).

Each year, academics from Computing and Creative Arts developed a working plan to embed the live brief as the main teaching activity across relevant modules. Students were organized into cross disciplinary groups of between 3-5 groups students to respond to the brief. The resulting artefacts formed the basis for students' written assignments.

The live brief was planned by academics as the main teaching activity for all students on relevant modules. As per the method, participation in the research was optional.

1.6.2 Reflexivity

The discussion of reflexivity brings the introduction to a natural conclusion, and Creswell suggests that there is a recognisable trend to situating research both within different contexts and with attention to reflexivity (Creswell, 2013). Reflexivity refers to the way in which researchers explicitly refer to their personal beliefs, values, role or experience as a tool for self-awareness, but also to inform the reader of the degree to which they may have influenced the process or outcomes (Nolas, 2011; Creswell, 2013; Lub, 2015). Having looked outward at the external contexts that have provided a rationale for the research, it is appropriate to look inwards and situate myself within the research.

I trained as a teacher over twenty years ago and have been working in higher education for over a decade. My current role is as an Associate Professor in Professional Education, and I teach postgraduate courses almost exclusively. Virtually all my students are themselves teachers, clinical educators or aspiring education practitioners; many have been academic colleagues obtaining a teaching qualification.

Almost fifteen years ago, about the time I entered higher education, literature suggested that academics had a sense of 'powerlessness' and 'weariness' in response to the considerable workload associated with bureaucratic accountability that had resulted from considerable changes (D'Andrea and Gosling, 2005, p. 15), many of which have been discussed in the introduction. I recognise the challenges of the sector, but most were a part of my world when I became an academic. I am, however, increasingly aware of the rise in metrics and the use of data as part of my day-to-day practice. My own feelings are of wariness as opposed to weariness. I have real concerns about the time it will take me to learn new systems and ways of understanding data properly, and I am acutely aware of the limitations of data. Like many academics, I feel at times that I am a receiver of change rather than a participant in the process (Hotho, 2008) and this can be frustrating.

My concerns are recognised in much of the literature that underpins this work. The shortcomings of metrics and the burden they place on academics have also been reported beyond academia, with headlines like 'Our obsession with metrics turns academics into data drones' (Guardian, 2015). The pandemic has added further complexity, leading to frustration among academics who suggest that, 'the TEF's metrics were already an extremely poor proxy for quality but will be of even less use in light of the impact of Covid

[...] Many staff are already facing burnout and heightened stress and don't need more pointless box-ticking bureaucracy' (Parker, 2021).

My frustrations with metrics, while significant, do not define my practice nor this research. Acknowledging my own frustrations with metrics is just one piece of the reflexive process in this work. In making elements such as my frustrations, my role and my experience explicit in the narrative in the outset, I am cautioned through my own writing to endeavor to produce a balanced narrative, and I invite the reader to judge that I have done so. Transparency is a vehicle for reflexivity as it ensures that the reader is made aware of where and how the researcher might affect, or be affected by the process (Smith, 2009); I have attempted to embed reflexivity throughout the narrative.

Moreover, the insight brought by an insider may be seen to have a positive impact. The scholarly work of education practitioners provides credible and powerful contributions to political and social discourses, and 'subjective personal knowledge' should be valued rather than hidden by excluding the use of 'I' (McNiff, 2008, p. 352). My own professional knowledge and experience have been essential both in engaging with literature as well as at a practical level, such as in the analysis of learning outcomes described in the method. A second and, I believe, positive impact has been my own view of students as key stakeholders. In the past, I have sought opportunities to carry out research with students (e.g. Knight, Rochon and Hailey, 2015; Procter-Legg and Rochon, 2017). I believe that as key stakeholders, students should be actively and ethically involved in research on learning and teaching. This belief has also informed the way I included and approached students and their views in the research.

1.6.3 The insider-researcher

A key point in relation to reflexivity is my own role in relation to the live brief projects. This thesis is based on a piece of insider research. Insider research is characterised by having some insight into the group or organization where the research is carried out (Fleming, 2018) and part of an established trend, driven in part by professional doctorates (Mercer, 2007). In this case, I am an academic carrying out research in a university with which I have an established relationship. The students are not my own students and the academics who facilitated the live briefs are not part of a team I work with directly. There is nonetheless significant complexity of having some type of relationship with the organization and

individuals where research is being carried out. Understandably, insider research is suggested to have both benefits and tensions (Brannick and Coghlan, 2007; Mercer, 2007; Unluer, 2012; Humphrey, 2013; Fleming, 2018).

Although it is often chosen for reasons of practicality and time constraints (Hewitt Taylor, 2002), insider research also carries some benefit in terms of being able to operationalise knowledge. When deployed openly with reflexivity, insider research affords rich insight that might otherwise not be achieved (Brannick and Coghlan, 2007).

According to Unluer (2012), there are particular challenges in relation to being an insider researcher as part of a case study. These include tensions between being an educator and a researcher, issues of familiarity which might lead to key information being overlooked; assumptions based on previous experience that may prevent a thorough engagement with data, or a lack of perspective that prevents the researcher from seeing issues clearly and potential for participants to make assumptions about what might already be known.

Engaging consciously with each of these issues is seen as a means to mitigate their potential influence (Unluer, 2012). Accordingly, I have been explicit about my role and relationship with the university as a means of being open about the tensions that exist. Familiarity was less of an issue for me in relation to this research; I was not involved with the students or academics prior to the research and had had limited experience with live briefs. In this way, I had an open mind to what might be said about the experience. As per the method, I deliberately selected contextual text coding (CTC) to analyse focus group transcripts in part so that I could both recognise any assumptions that were supported by literature and look beyond them at the data itself. The analysis element of any research should be fully transparent the 'basis for claims' transparent in reporting as well, as there is always a risk that the passionate researcher frame information in a way that they believe to be the most persuasive (Brooks, te Riele and Maguire, 2014, p. 126). While this can happen unconsciously, using CTC made the process of analysis as transparent as possible.

Unluer's (2012) observation that there was a potential for participants to assume I had certain knowledge was, in fact, an issue. At several parts of the focus groups, for example, students would make passing comments about processes or issues of which I had no knowledge. When this happened, I reiterated my role in a light touch way and made it clear that I had no knowledge of processes outside of the live brief. This also happened with staff

who, for example, referred to teaching processes with which I had no familiarity, such as personal tutoring. As with the students, I clarified that was not familiar with the process, and asked for further information.

1.7 Introduction summary

The introduction has built a rationale for the thesis and situated it within national, professional, theoretical, policy and organizational contexts. Having established its aim to examine student and staff perceptions of an experiential project in higher education in the context of intended learning outcomes, it has also established details of the project and my own relationship with the research. Chapter 2 of the thesis reviews and discusses the literature relevant to the way that learning in higher education is designed and examines existing literature on experiential learning. Chapter 3 outlines the methodology and details of the method undertaken to collect and analyse data. This is followed by the results and discussion in Chapter 4, and the work concludes by drawing together these findings in Chapter 5, where they are resituated in relation to professional practice.

2 Reviewing the literature: how learning is understood in higher education and experiential learning

In order to provide the basis for the critical discussion of the findings in the results and discussion section, this chapter provides a review of contextual literature. Following a brief outline of the approach to the review, the first part of the chapter draws together literature on learning domains used to inform the design of learning in higher education. The second part of the chapter reviews literature on experiential learning, its key features and criticisms, and how it has previously been investigated by other researchers.

Particular attention is drawn to literature relating to live briefs as a specific type of experiential learning. Where appropriate, theoretical knowledge and theory-based studies are juxtaposed with perspectives from cognitive psychology and neuroscience. Cognitive psychology and neuroscience are immense fields in their own right, and here offer complementary and contrasting views that provide a more rounded perspective on how learning occurs. While these fields are often mistakenly used interchangeably, 'cognitive psychology focuses on explanations related to the mind, whereas neuroscience is concerned with figuring out what happens in the brain' (Weinstein, Sumeracki and Caviglioli, 2019b, p. 15).

2.1 Exploring knowns and unknowns through a narrative review

Systematic reviews, where processes for searching are defined in advance and set out in a way to support replicability, are viewed positively for their rigour and transparency, both of which are seen to enhance objectivity (Pae, 2015; Davies, 2019; Pellegrini, 2019) when used as a discrete methodology. Education research, however, typically uses a narrative style of literature review, which relies on the expertise of the researcher and is focused on findings as opposed to approach (Bryman, 2012). It is my professional experience, for example, that has given me some grounding in relation to the writings of Dewey and Kolb on experiential learning.

As well as being more suited to prefacing primary research as opposed to a research approach in its own right, using a narrative review has also provided practical advantages. This approach was deemed better equipped to deal with research over an extended period of time. While it is often considered an essential starting point of the research process (Bell, 2005; Boote and Beile, 2005), engagement with literature is expected to be continued

through targeted further reading, for example, in conjunction with research findings (Leedy and Ormrod, 2015).

Narrative approaches also have the benefit of taking advantage of literature happened upon by 'chance'. The serendipitous acquisition of literature or relevant information is seen to enhance the research process (Nutefall and Ryder, 2010; Makri and Blandford, 2012; Darbellay *et al.*, 2014), and my own experience of chance conversations with colleagues would seem to confirm this. For example, it is a recognisable concern that the spheres of education and cognitive psychology do not tend to overlap naturally in practice (Weinstein, Sumeracki and Caviglioli, 2019b), and certainly my own targeted searches had not yielded any links to cognitive psychology. As a professional doctoral student, I therefore found it helpful and appropriate to engage with literature signposted to me through chance conversations with colleagues. Several key articles, including a book on cognitive psychology, were recommendations via a chance conversation.

Breadth and depth cannot be left to collegial support and serendipity, however. There is a case for employing key principles including transparency and rigour to enhance the structure of a narrative literature review, while taking advantage of approaches that are seen to enhance the final output (Mallett *et al.*, 2012). For this reason, an initial methodical review of literature was carried out on experiential learning in higher education. A simple model of searching using targeted key words, abstract screening and inclusion based on suitability as per Randles and Cotgrave (2017) was employed. Databases targeted included ProQuest, Science Direct, ERIC, Wiley Online Library and Emerald Insight.

This methodical approach, coupled with ongoing discussions with colleagues and the development of my own knowledge in relation to accepted theory, was instrumental in shaping the research aim. At the outset of my research, for example, I was particularly interested in the affordances of experiential learning to support learning through partnership; that is to say, the way that the traditional student-staff relationship was disrupted by live briefs and how this might create increased opportunities for learning, particularly when used across disciplines.

Engaging with the literature highlighted that focusing on partnership was limiting, and that the wider context of how learning is designed was important to the research. The literature suggested multiple benefits of experiential learning, and 'partnership' between students

and staff did not appear to be the main reported benefit. More importantly, I had not initially realized the richness of the background reading on the domains of learning and their impact on the development of learning outcomes. The importance of the context of the intended learning outcomes became apparent, and I adjusted my aim accordingly. From a starting point of examining the perceptions of students and staff working in partnership on a live brief across different disciplines, the research aim was refined over time to one that examined students' and staff perceptions of an experiential project in higher education in the context of intended learning outcomes.

2.2 Domains of learning and their use in higher education

This section reviews the theory of domains of learning. In doing so, it situates the claim in the introduction that the cognitive domain is well provisioned for in higher education within literature.

The proposition that there are different domains of knowledge is most recognisably set out in the *Taxonomy of Educational Objectives* (1956), a publication led by Benjamin Bloom. This explains the ongoing, if slightly misleading, attribution of 'Bloom's Taxonomy' for a newer revised version in which Bloom had no involvement (Hoque, 2016). The revised taxonomy, written by a team that included a key member from the original publication, has sufficient resemblance that the continued attribution to Bloom is understandable. In spite of the widespread use of 'Bloom's' to refer to the revised taxonomy, I have used Anderson *et al.*'s *revised taxonomy* (2001) or *the revised taxonomy* throughout the thesis and referenced its authors as would be expected.

In the original work edited with colleagues, Bloom introduced three domains of learning: cognitive, affective and psychomotor. While its application is broad, it was designed for higher education (Krathwohl, 2002). The original work defines the domains of learning thus (Bloom *et al.*, 1956, p. 7):

Cognitive domain: 'knowledge and the development of intellectual abilities and skills'

Affective domain: 'changes in interest, attitudes and values, and the development of appreciations'

Psychomotor domain: 'manipulative or motor-skill area'

I have used these definitions throughout the thesis unless otherwise clarified.

2.2.1 Cognitive domain

Bloom *et al.*'s Taxonomy (1956) was subtitled *Handbook 1: Cognitive Domain*. The authors briefly introduced the other domains and their plan to produce dedicated handbooks for each (Bloom *et al.*, 1956), but the original taxonomy was exclusively focused on the cognitive domain. It was not the intention of the original team to suggest that domains of learning, such as cognitive and affective could- or indeed should- be separated (Bloom, Krathwohl and Masia, 1964). The separate treatment of domains happened for pragmatic reasons: the research was only completed on the cognitive domain (Bloom *et al.*, 1956). However, the release of the cognitive domain as the 'first' taxonomy was perhaps the start of its being privileged in education.

Many educators have either not known or forgotten that there was an intention for any other domain to be published beyond the cognitive (Booker, 2007). While two more handbooks were envisioned for the affective and psychomotor domains, these domains never received the same attention as the cognitive domain. *Handbook 2*, the affective domain, was published in 1964 with the authors noting they felt it to be far less robust than the first handbook (Bloom, Krathwohl and Masia, 1964), perhaps leading educators to be less likely to deploy the integration of the work into practice. The handbook for the psychomotor domain was never published.

The revised *Taxonomy for Learning, Teaching and Assessing* was published in 2001 (Anderson *et al.*, 2001). It remains focused on the cognitive domain, but attempts, via a two-dimensional taxonomy, to introduce some aspects of the affective domain (Appendix 8.5.1). The two-dimensional model is pictured as a table. The rationale for this conceptualization is, according to the authors, the realization of a taxonomy whose primary focus is in its use as a planning tool and educators are invited to plot their learning objectives (outcomes) within the table (Anderson *et al.*, 2001). This is perhaps in recognition of the way that practitioners had, for some time, operationalized the original taxonomy to support planning in learning and teaching.

In the revised taxonomy table, the *cognitive process dimension*, which strongly resembles the original cognitive hierarchy, appears across the top. The new *knowledge dimension* appears down the side. The knowledge dimension shows a progression of categories of knowledge: factual, conceptual, procedural and metacognitive (Anderson *et al.*, 2001). It is the metacognitive knowledge furthest along the continuum of categories of knowledge, that ‘in some respects bridges the cognitive and affective domains’ (Anderson *et al.*, 2001, p. 259).

The creation of a single taxonomy is, according to the authors in response to legitimate criticism that the original separate treatment of domains gave the misleading impression that it would isolate different domains of learning. In practice, cognitive and affective learning would naturally occur together (Anderson *et al.*, 2001), a perspective that has some grounding in neuroscience (Immordino-Yang and Faeth, 2010; Immordino-Yang and Damasio, 2011). The creation of a two-dimensional framework was in partial response to avoid the separation of domains in the original *Handbook*, with the metacognitive category viewed as a bridge between cognitive and affective domains (Anderson *et al.*, 2001).

The subtleties of this brief discussion are often missed, however; as with the release of *Handbook 1*, the cognitive domain is somewhat advantaged by the publication of the revised taxonomy. The addition of a second dimension, or the allusion to the cognitive-affective ‘bridge’ has seen virtually no attention in popularly used resources available. Instead, the most notable change to the revised taxonomy are modifications to the original classifications that have attracted the attention of practitioners. The revised taxonomy sets out hierarchical dimensions of the cognitive process, beginning with the most basic category of *Remembering*, where students might be able to label or list something from memory (Anderson *et al.*, 2001). This was formerly *Knowledge* in the original classifications. As in all the categories, there has been a shift from noun to verb. In the revised taxonomy, the most ‘cognitively complex’ is the category of *Creating*, the newly defined category replacing the original *Evaluation* (Anderson *et al.*, 2001).

2.2.2 Affective domain

The affective domain is recognised as being particularly challenging to capture. In *Handbook 1*, Bloom *et al.* (1956) acknowledge the challenges of trying to articulate the affective domain in *Handbook 2*, which was under development. In their words, ‘It is difficult to

describe the behaviours appropriate [...] since the internal or covert feelings and emotions are as significant for this domain as are the overt behavioural manifestations' (Bloom *et al.*, 1956, p. 7). *Handbook 2: The Affective Domain* took almost a decade to complete.

Importantly, the authors suggested that they had been compelled to produce an affective taxonomy, however imperfectly, because educators had overwhelmingly recognised the place of emotion and values in learning (Bloom, Krathwohl and Masia, 1964). The affective domain continues to be seen as both important and yet underdeveloped in education (Ringness, 1975; Brett *et al.*, 2003; Brownell and Jameson, 2004; Boyd, Dooley and Felton, 2006; Beard, Clegg and Smith, 2007; Shephard, 2008; Birbeck and Andre, 2009; Matthews, 2010; Neuman Allen and Friedman, 2010; Savickiene, 2010; Immordino-Yang and Damasio, 2011; Buissink-Smith, Mann and Shephard, 2011; Hyland, 2011; Kiener, Green and Ahuna, 2014; Bandaranaike and Willison, 2015; Grawemeyer *et al.*, 2017; Rogaten *et al.*, 2018; Salzmann, Berweger and Ark, 2018; Ilonen and Heinonen, 2018). Large-scale reviews of learning outcomes (Atkinson, 2015) and learning gain (Rogaten *et al.*, 2018) in higher education suggest that the affective domain is the least provisioned for in higher education.

Bloom *et al.* defined the affective domain as being related to 'changes in interest, attitudes and values, and the development of appreciations' (Bloom *et al.*, 1956, p. 7). In practice, it includes 'awareness or discernment of our and other's emotions, the ability to connect our emotions to those of others, the display of emotion, and the ability to manage or regulate one's emotions' (Brett *et al.*, 2003, p. 1). It can also refer to feelings about learning itself: 'attitude, confidence, enjoyment, enthusiasm for a topic, feeling comfortable with complex ideas, interest in a topic, motivation, satisfaction and self-efficacy' (Rogaten *et al.*, 2018, p. 5).

The notion of thoughts and feelings being important in learning is regularly cited as being an inseparable part of learning. It is suggested that the 'feelings and thoughts aroused by [learning]' are in themselves important (Aitchison and Graham, 1989, p. 17). Without them, there is little incentive to learn. In discussing his model for adult skills development, Dreyfus acknowledges that feelings that range from disappointment due to failure to excitement about success mean that learners care. In his words, 'For embodied, emotional beings like us [...] success and failure do matter. So the learner is naturally frightened, elated,

disappointed, or discouraged by the results of his or her choice of perspective' (Dreyfus, 2004, p. 178).

Affective learning can therefore be seen to have two aspects: firstly, the 'learner's attitude, motivation and feelings toward the learning' and secondly, 'the feelings, attitudes, and values that are identified, explored, and modified in some way because of the learning experience' (Neuman Allen and Friedman, 2010, p. 2). The first of these is sometimes described as an affective state. Positive affective states, where a learner is interested or curious, for example, have been proposed as supporting the learning process; negative affective states, such as frustration or feelings of vulnerability in relation to the materials or the environment can be said to negatively impact the learning process (Smith *et al.*, 2013; Grawemeyer *et al.*, 2017). The level of comfort students feel, a positive affective state, is further seen to increase affective outcomes, such as perseverance with difficult material (Kiener, Green and Ahuna, 2014). 'Safe spaces', which are environments where those present feel that they can communicate with honesty and without judgement, are also seen to support affective attributes where those present feel valued, listened to and respected (Kisfalvi and Oliver, 2015).

While both aspects of the affective domain are important, it is the change or modification aspect that is associated with learning. As Bloom *et al.* (1956) note, the affective domain recognises internal emotions and their explicit expression. The complexity of the affective domain is in part due to this interplay between the internal and external. According to Brett *et al.* (2003), emotion is often seen as involving three subcomponents:

1. Feeling: 'physiological sensation'
2. Cognition: 'subjective thoughts that accompany the sensation'
3. Behaviour: includes a range of external actions relating to feelings and cognition

Like the cognitive domain, the affective domain is set out by Bloom *et al.* as a hierarchy (Bloom, Krathwohl and Masia, 1964). At the most basic level, the learner is prepared to listen or 'receive phenomena'. At a higher level, the learner may meet the objective of 'valuing'. Valuing might be manifested through some type of demonstration that the learner believes in the process and shows initiative in planning positive change. At the highest level, learners have internalized values, and act accordingly. This might be demonstrated through actively and positively participating in teamwork, or actively taking on what others say. The

overlap between the affective and cognitive domains is evident when considering how affective learning might 'look' in practice. For example, in showing initiative, a learner would require some sense of what is needed, involving cognitive engagement (Bandaranaike and Willison, 2015).

Finally, the affective domain is of interest to educationalists because of its potential impact on the learning process and longer-term impact on commitment or beliefs. In cases where students are learning to become part of a profession, 'affective occupational commitment', where learners emotionally commit to become part of a profession, is seen as having a potential long term impact on retention (Salzmann, Berweger and Ark, 2018). In this way, cognitive development, in the form of knowledge, can be seen to have a shorter impact than its affective counterpart.

2.2.3 Psychomotor domain

While the cognitive and affective domains received individual treatment in the original works led by Bloom, the psychomotor domain handbook was never realized. This was based in part on the challenge of developing the psychomotor domain, but Bloom *et al.* (1956) were more concerned with its usefulness. In their words, 'so little has been done [in the area of this domain] that we do not believe the development of a classification of these objectives would be very useful at this time' (Bloom *et al.*, 1956, pp. 7–8). The authors invited comments on their views of the usefulness of the domain and expressed interest in hearing from teachers who were interested in it.

Several taxonomies were created to address the perceived gap. Three key works are those of Dave (1967, 1970), Harrow (1972) and Simpson (1972) (Krathwohl, 2002; Hoque, 2016; Sideeg, 2016; Begam and Tholappan, 2018; Ramlee *et al.*, 2020). According to Sideeg (2016), Harrow's model focusses more exclusively on physical movements, while Simpson and Dave's models are seen to incorporate aspects of both the cognitive and psychomotor in terms of perception.

The psychomotor domain is perhaps one of the least addressed in education, but more recently there appears to be a greater case for its recognition. A domain that incorporates physical activities is seen as particularly relevant to vocational learning, where skills including designing, for example, involve both cognitive and psychomotor domains (Ramlee *et al.*, 2020). By this definition, there is also a valuable place for recognising the

psychomotor domain in higher education, which includes a significant number of vocational pathways.

According to Atkinson (2015), the perceived lack of relevance of the psychomotor domain is attributed to the restricted nature of its interpretation, 'often undermined by a narrow conceptualisation of physical tasks, but if we widen the definition to include software applications as the use of tools, its relevance becomes immediately evident' (Atkinson, 2015, p. 161). Atkinson's Circles (2013) (Appendix 8.4) is one of several alternative holistic taxonomies, created in part by drawing together elements of existing works (Suto *et al.*, 2020). Although Atkinson is highly critical of the prioritization of the cognitive domain that has resulted from the overreliance on Anderson *et al.*'s revised taxonomy (2001), Atkinson nonetheless recognises its value. The Taxonomy Circles therefore draw heavily on the work of Anderson *et al.* (2001) and Dave's (1967, 1970) psychomotor domain. Atkinson justifies the selection of Dave's (1967, 1970) taxonomy because this is seen to highlight the progressive nature of skills development both appropriate to vocational learning but equally applicable to higher education (Atkinson, 2018). Dave's taxonomy progresses through the stages of *imitation*, where a physical action can consciously be copied, through to *naturalization*, where different physical skills can be combined and used easily with limited physical or mental effort (Dave, 1970). Atkinson similarly begins with *imitation*, and progresses through to *embody*, which similarly includes the 'ability to perform actions in an automatic, intuitive or unconscious way appropriate to context' (Atkinson, 2018).

2.2.4 Awareness and tacit learning

Atkinson's Circle of the psychomotor domain, and specifically the progression from conscious imitation through to unconscious application, is reminiscent of Dreyfus' (2004) five stages of skills acquisition model. The five-stage skills model sets out stages of novice, advanced beginner, competence, proficiency and expertise. Dreyfus likens progression through the stages as being akin to learning to drive proficiently, where at first a novice is consciously aware of the rules and actions involved, but eventually unconsciously performs and reacts to a wide range of situations consistently and competently (Dreyfus, 2004). Conceptually, both Atkinson (2013) and Dreyfus (2004) offer frameworks which highlight the progressive nature of skills development, and changes to awareness as one progresses through the stages. Bloom *et al.* (1956) themselves saw consciousness as an important

feature of the relationship between psychomotor and cognitive domains. They noted that in the cognitive domain, the rise in complexity happens in parallel with a rise in awareness of complexity; this is seen to happen inversely within the psychomotor domain. For reference, they point to the example of behaviours that become after 'time and repetition, automatic or are accompanied by a low level of consciousness' (Bloom *et al.*, 1956, p. 20).

In the wider literature, a number of key works underline the relationships between unconscious awareness, emotion and learning, and this relationship is evident across education, neuroscience and cognitive psychology. The original works by Bloom *et al.* (1956) noted awareness, or conscious activity, as a fundamental concept: 'One of the major threads running through all the taxonomy appears to be a scale of consciousness or awareness' (p. 19). The association between awareness or consciousness and learning was evident in several areas of literature which have already been discussed in relation to the affective-cognitive domains. As per the discussion of Anderson *et al.*'s revised taxonomy (2001), the cognitive dimension and specifically 'metacognition' is seen to bridge the cognitive and affective domains; metacognition involves both thought and awareness of thinking. Similarly, conscious realization featured in Brett *et al.*'s (2003) explanation of the subcomponents of emotion where 'feeling' (a sensation is experienced) was seen to precede 'cognition', where thoughts accompanied the sensation. Notable educational theorists including Kolb (Kolb and Fry, 1974; Kolb, 1984) and Bruner (1986), similarly recognised that cognition and emotion worked alongside one another. A neuroscientific perspective would support this interplay: Immordino-Yang and Faeth (2010) point to a substantial evidence base that highlights that both conscious and nonconscious emotions as being fundamental to guiding cognitive learning, that is, a demonstrable achievement of an outcome. Moreover, they suggest that without emotion, learning is impaired (Immordino-Yang, Yang and Damasio, 2016).

For educationalists, the relationship between awareness or consciousness of knowledge and its creation is perhaps most recognisably captured in the concept of tacit knowledge, popularized by Polanyi (1966). While there is significant variation in definitions, tacit knowledge refers to 'knowledge that is widely held by individuals but not able to be readily expressed' (Dampney, Busch and Richards, 2002, p. 3). Tacit knowledge is often used as a shorthand to express deep forms of professional knowledge, but in his work, Polanyi

highlighted the relationship between the cognitive and physical self, pointing to experiments that mirror more recent ones in neuroscience. In one experiment, for example, Polanyi suggests that a participant was seen to have 'learned' to avoid using trigger words that were associated with a small electric shock without being able to articulate that they were avoiding certain words. In Polanyi's view, 'These experiments show most clearly what is meant by saying that one can know more than one can tell' (Polanyi, 1966, p. 8).

Other experiments have similarly established the link between physical responses, whether conscious or unconscious, and tacit knowledge in the form of deep expertise (Nakamura and Nagayoshi, 2019). While these experiments highlight the relationship between conscious and explicit ways of learning and knowing, much of what is currently taught and understood about tacit knowledge has emerged through the work of Wagner (1987), who characterizes tacit knowledge as practical knowledge that is learned without formal instruction, and, in a job or profession increases with experience (Wagner, 1987 *cited in* Insch, McIntyre and Dawley, 2008, p. 562). It is expertise, skill, and 'know how', as opposed to codified knowledge' (Dampney, Busch and Richards, 2002, p. 3). Experienced professionals are seen to possess significant tacit knowledge, and characteristically find it difficult to share or develop in others (Roth, 2008).

2.2.5 Domains of learning in higher education

In higher education, the cognitive domain dominates the planning and design of learning. A review of literature suggests that the prominence of the cognitive domain might be attributed in part to the release of *Handbook 1* by Bloom *et al.* (1956). The affective domain was subsequently released with self-declared deficits and the psychomotor domain was never developed by the original working group, perhaps contributing to their limited use across the education community. The popular use of 'Bloom's', meaning a cognitive taxonomy, was then consolidated in Anderson *et al.*'s revised taxonomy (2001) which now underpins the design of learning across higher education (Neuman Allen and Friedman, 2010; Atkinson, 2015).

Cognitive knowledge dominates for other reasons, however, beyond the release or re-release of a cognitive taxonomy. There is an established under development of understanding of the affective domain in education. Literature suggests that academics do value affective learning and actively seek to incorporate it within their teaching (Bowman

and Akcaoglu, 2014). However, facilitating or supporting changes in feelings, attitudes and values is a significant challenge, making the affective arguably the most difficult domain to teach and assess (Neuman Allen and Friedman, 2010). Moreover, the teaching of content is familiar to academic staff. Pre-and post 'Bloom's' and in cultures that have never heard of Bloom's, (1956) or Anderson's *et al.*'s (1956) revised taxonomy, school systems and higher education have historically worked with the cognitive domain.

Understandably, universities emerged as places for the development and dissemination of knowledge (Hooker, 1997). Perpetuating existing models of teaching and learning in higher education are therefore familiar. In the words of one author, 'There is a challenge in moving academic staff from the comfort of teaching content-heavy rules [of the subject matter] to facilitating very high levels of educational and affective behaviours, but the rewards are immeasurable' (Huxley-Binns, 2015, p. 317). This statement is part of a larger commentary on the benefits of experiential learning in a particular subject area (law). However, the word 'immeasurable' here is apt, as it points to the limited perceived benefits of activity that does not result in a recognisable metric. The ability to re-present information studied has been valued with high grades, but this type of learning does not equip students for current jobs that value creativity (Sawyer, 2011).

As well as the comfort of using existing models of learning and teaching, reluctance to include affective learning outcomes at programme level may be attributed to academics' preparedness. It is also suggested that academics teaching in higher education focus on cognitive knowledge in part because there is less understanding of the theoretical basis for affective learning (Shephard, 2008). It is also possible that this knowledge is idealized and academics lack the understanding of or willingness to develop soft skills commonly seen as graduate attributes (Hill, Walkington and France, 2016). There is also concern among academics that programmes that seek to offer alternative teaching methods which promote a more rounded 'graduateness' might be seen as less valuable and therefore poorly received (Bell and Liu, 2019).

Academics who do attempt to include affective learning outcomes are likely to find the task of assessing these extremely challenging (Buissink-Smith, Mann and Shephard, 2011). There is some evidence to suggest, however, that students would like to be recognised for hard

work or diligence, for example, or be involved in discussions where they are able to defend their approach or handling of the subject (O'Donovan, 2017).

A further and considerable issue of affective learning are the ethics involved, which may further cause academics to shy away from the teaching of values. Bloom *et al.* (1964) observed uneasiness about grading learners on 'interest, attitude or character development', noting a lack of robust or credible means of assessing the development of knowledge (Bloom, Krathwohl and Masia, 1964) that continues today. While 'values and behaviours' identified through 'Apprenticeship Standards' provide established and trusted values for academics to teach, going beyond these approved values presents a challenge. There is concern that the teaching of values may be seen as 'indoctrination', as in cases of a hidden curriculum (Shephard, 2007, p. 89).

The hidden curriculum 'refers to the unspoken or implicit values, behaviors, procedures, and norms that exist in the educational setting' (Alsubaie, 2015, p. 125). The phrase 'the hidden curriculum' is attributed to Dewey's concept of collateral learning (Czajkowski and King, 1975; Portelli, 1993; Killick, 2016; Blasco, 2020). 'Collateral learning in the way of formation of enduring attitudes, of likes and dislikes, may be and often is much more important than the spelling lesson or lesson in geography or history that is learned'. It is these attitudes, argues Dewey, that fundamentally matter in the longer term because of their endurance (Dewey, 1938, p. 48). The idea that values and attitudes endure but content knowledge becomes outdated is one of the key rationales for prioritizing affective learning, and is supported by more recent studies (e.g., Caulfield and Woods, 2013).

The hidden curriculum can be viewed both positively and negatively. Positive examples of the hidden curriculum might include an embedding of 'green values' through visible use of renewable energy or promoted activities of care of green spaces (Cotton, Bailey and Tosdevin, 2020). We use signposting around my own institution, for example, such as 'vegetable-based cutlery' in the cafeteria. Another positive example is the availability and visibility of food that meets different cultural needs to promote inclusivity (Killick, 2016). Concern for the environment and inclusivity are relatively, although not completely, uncontested values. A hidden curriculum is often viewed in a negative light, however, and has recently gained attention through issues including colonization of the curriculum and gender rights; accordingly, this type of values teaching must be brought to the surface and

questioned, even when it is seen to have a positive intention (Killick, 2016; Hinchcliffe, 2020). Making explicit does not always equate to reducing tensions, as can be seen with the teaching of 'Fundamental British Values' in schools, for example, introduced in 2014. This is seen to have created significant tensions in its potential interpretation as discriminatory (Struthers, 2017). It is, after all, difficult to know what the 'right' values are. Given the moral complexities, academics may feel some apprehension about entering into the teaching of such values.

A multitude of other systems of taxonomies are available, but as noted by Anderson *et al.* (2001) on reflecting on some of the shortcomings of the revised taxonomy, none of these have seen widespread adoption. Indeed, the popular handbook for higher education practitioners, that I have myself used, makes no allusion to other taxonomies and sets out domains of learning as including cognitive, affective and psychomotor (Fry, Ketteridge and Marshall, 2015). A review of available taxonomies identified nine models that would be considered appropriate for application, including the revised taxonomy (Anderson *et al.*, 2001), suggesting that other taxonomies are 'underexplored' (Suto *et al.*, 2020, p. 26). Several other taxonomies aim for a holistic approach, meaning they bear a significant superficial similarity with Bloom's; this would include Atkinson, Hauenstein but also others in literature (e.g., Kraiger, Ford and Salas, 1993).

As well as other taxonomies, there are other systems of classification, many of which overlap with understandings of Bloom *et al.*'s (1956) or Anderson *et al.*'s (2001). Rogaten *et al.* (2018) suggest that a significant number of studies in education and psychology have applied an affective, behavioural and cognitive or 'ABC' classification to differentiate between types of learning. The ABC classification system is referred to in the OfS final report on learning gain studies (Howson, 2019). Apprenticeship standards must consistently refer to knowledge, skills and behaviours, with the latter incorporating values and attitudes (Institute for Apprenticeships and Technical Education, 2021). In higher education, however, 'Bloom's' is considered a standard way of classifying learning and developing learning outcomes (Newton, Da Silva and Peters, 2020).

2.3 Experiential learning

As Kolb puts it succinctly, 'learning is the process whereby knowledge is created through the transformation of experience' (Kolb, 1984, p. 38).

Experiential learning theory is attributed to John Dewey (1938) and was later popularized by Kolb (Kolb and Fry, 1974; Kolb, 1984). While Kolb credits Piaget, Lewin and Dewey as having informed his experiential learning cycle, he credits Dewey with the accepted integration of experiential learning in higher education, calling it 'the legacy of John Dewey' (Kolb, 1984, p. 4). While Kolb has been criticized for oversimplifying some of Dewey's key concepts (Miettinen, 2000), there are several features of experiential learning that are consistent between Dewey and Kolb. These include experience itself, the organization of experience and the notion of reflection as being central in promoting learning.

2.3.1 Experience and change

Unsurprisingly, both Dewey and Kolb both saw experience, doing something, as central to learning. Building on the work of social constructivist theorists including Vygotsky, Dewey emphasizes the active nature of learning: 'Experience does not go on simply inside a person [...] Every genuine experience has an active side' (Dewey, 1938, p. 39).

Both theorists recognised that learning that emerged through experience was far greater than a cognitive event. Kolb, particularly, recognised learning as holistically bringing together feeling and cognitive learning. In his words, 'To learn is not the special province of a single specialized realm of human functioning such as cognition or perception. It involves the integrated functioning of the total organism- thinking, feeling, perceiving and behaving' (Kolb, 1984, p. 31). Kolb's view of learning as holistic in this way has parallels with literature earlier discussed in conjunction with the role of feelings and affective learning.

2.3.2 Organisation and scaffolding

While an advocate of experience, Dewey acknowledged that his 'belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative (Dewey, 1938, p. 25). Dewey recognised that the organisation of experiential activity was essential. He was critical of experiences that, while engaging to the learner, are not sufficiently considered in terms of promoting learning. In his words, 'unless experience is so conceived that the result is a plan for deciding upon subject matter, upon methods of instruction and discipline, and upon material equipment and social organization, it is wholly in the air' (Dewey, 1938, p. 28). In this way, experiential learning requires both organization and scaffolding. While the term 'scaffolding' emerged from child development theory and still carries a specific meaning in this context, it is now

widely understood to refer to processes and frameworks of support for learning that are contingent to need, and involves the eventual fading of support when it is no longer needed (van de Pol, Volman and Beishuizen, 2010).

Dewey's vision of experiential learning as a robustly organized approach has marked overlap with the work of two other key theories: Bloom's Taxonomy (1956) and the later revised taxonomy (2001), and Biggs' (2003) constructive alignment. Like Dewey (1938), Bloom *et al.* (1956) recognised that the purpose of learning must be clearly defined, that activities should be carefully considered in terms of organisation and evaluated with care. Framed as questions, they ask, 'What [...] objectives should the school or course seek to attain? What learning experiences can be provided that are likely to bring about the attainment of these purposes? How can these learning experiences be effectively organized to help provide continuity and sequence for the learning [...]? How can the effectiveness of experiences be evaluated?' (Bloom *et al.*, 1956, p. 25). This was later reframed in a revised version of the taxonomy, where the questions seem closer to the theory of constructive alignment: 'What is important for students to learn [...]? How does one plan and deliver instruction [...] How does one ensure objectives, instruction and assessment are consistent with one another?' (Anderson *et al.*, 2001, p. 6). As per the introduction, Biggs (2003) proposed that knowledge was both constructed and that the alignment of intended outcomes, activities to facilitate learning and assessment was key. While Biggs' theory is perhaps more explicit in suggesting a tight alignment between outcomes, activity and assessment, the overlap between his views and those expressed by Dewey (1938) and Bloom *et al.* (1956) (and later Anderson *et al.*, 2001) is remarkable.

Kolb's work assists in the organization of experiential learning at a practical level. Much like Anderson's *et al.*'s revised taxonomy (2001), the inclusion of an operational framework has done much to increase its popularity with educators. Kolb's cycle of experiential learning, which he is credited with having conceived (Kolb and Fry, 1974; Kolb, 1984) offers a practical template to operationalize many of Dewey's ideas. This cycle incorporates four stages: experience, reflecting on the experience, conceptualizing or concluding from the experience and then active experimentation or the application of new learning (Kolb, 1984). Given its accessibility, Kolb's experiential learning cycle is cited as the basis for a number of studies on experiential learning in higher education (Wilson, Yates and Purton, 2018; Kim,

2019; Kondratjew and Kahrens, 2019; Richardson, Stenquist and Stenquist, 2019; Tiessen, Grantham and Cameron, 2019; Ahmad and Nauman, 2020; Patil *et al.*, 2020; Sherman and Botkydis, 2020; Trongtorsak, Saraubon and Nilsook, 2021). While Kolb's integration of learning styles has, like other learning styles theory, received significant criticism (Coffield *et al.*, 2004; Clark, Kirschner and Sweller, 2012; Weinstein, Sumeracki and Caviglioli, 2019c), his experiential learning cycle remains well-regarded by educators as evidenced by its widespread use.

2.3.3 Reflection

Dewey and Kolb both stress the role of reflection within experiential learning as being fundamental: it is not the experience, but the reflection on experience that facilitates learning. The relationship between the two is needed to make the most of each. In Dewey's view, 'periods of genuine reflection only [happen] when they follow after times of more overt action and are used to organize what has been gained in the periods of activity (Dewey, 1938, p. 63).

Advocates of experiential learning caution that it is very possible to engage with an experience and not learn from it (Beard and Wilson, 2002). While experience without reflection does not preclude learners developing or gaining knowledge from it, reflection is seen as key. An often cited quote is that of Aitchison and Graham: 'regrettably "the last thing one learns from is experience" [...] experience is what you have to halt, check, negate, in order to get knowledge' (Aitchison and Graham, 1989, p. 17). Incorporating mindful reflection is therefore seen as an important tool in developing affective learning and this may take the form of reflection-in-action through questioning (Hyland, 2011) or as a purposeful 'scaffolded' part of the process in experiential learning (Coulson and Harvey, 2013, p. 401) In a live brief, this might involve an academic asking about progress, or current work. This activity affords insight into the process of learning (Wilson, Howitt and Higgins, 2016), or not, as the case may be, if work has not progressed. The role of the 'teacher' is, in fact, seen as key in facilitating reflection as is the willingness of the student to participate in the process (Fowler, 2008).

Reflection is generally viewed positively and reflective writing seen to have particular affordances which capture students' development in the affective domain (Boyd, Dooley and Felton, 2006) and which can otherwise be difficult to frame. However, reflective writing

as an assessment does have some notable shortcomings in that it is subject to manipulation. Bloom *et al.* (1964, p. 17) note that a student may 'exploit his ability to detect the responses which will be rewarded and the responses which will be penalized'. More recently, authors have also reported that the way that that reflective writing is deployed is subject to being gamified by students (Macfarlane and Gourlay, 2009). There is furthermore concern that, while it affords potential benefits, the 'formulaic' format of student reflection to capture affect risks being both reductionist and inappropriately treated as separate (Beard, Clegg and Smith, 2007, p. 249), a view supported both by the original and the revised handbook (Bloom, Krathwohl and Masia, 1964; Anderson *et al.*, 2001).

2.3.4 Authenticity

'Authenticity' conveys students' development of meaningful understanding versus more artificial and superficial memorization of content (Serrano *et al.*, 2018). Experiential learning is often described as being authentic (Knobloch, 2003; Denton and Papp, 2019).

A study of literature (Herrington, Oliver and Reeves, 2002, p. 281) on authenticity suggests that it has a significant number of defining characteristics. Notably, authentic tasks:

- Have 'real world relevance' as opposed to being situated in a particular location
- Are often ill-defined and complex, and naturally encourage interdisciplinary working
- Are 'investigated by students over a sustained period of time'
- Involve collaboration and reflection

There is real diversity in terms of what authentic experiential learning might 'look like' in practice. One example of experiential learning that illustrates the concept of authenticity is a study by Farley and Jacobwitz (2019). In this research, experiential learning was deployed as part of a midwifery programme where students were to develop knowledge and appreciation of cultural influences on nutrition during pregnancy. As well as research into core issues of nutrition, students selected a culture for examination in terms of its food 'prescription' during pregnancy (e.g. pregnant women to consume 'cold' foods with high water content, considered to be balancing) and then prepared dishes and included photographs as part of a report that contributed to a class cookbook. The resulting reflective discussions from this experience proved rich and insightful, promoting respect and value for different cultural beliefs that extended beyond issues of nutrition (Farley and

Jacobwitz, 2019). This example further highlights the affordances of authenticity in experiential learning in supporting high levels of affective learning outcomes, seen to require 'real world' experience (Ilonen and Heinonen, 2018).

While this illustrative example provides insight into the potential of experiential learning within a more vocational qualification, experiential learning can take a multitude of forms, many of which are suited to the classroom (Dewey, 1938). Each type of experiential learning can be seen to provide different opportunities. An outline of sixteen 'basic typologies', that range from having students 'adjust or suspend elements of reality' to creating restrictions using obstacles or sensory blocking (e.g. blindfolds) (Beard and Wilson, 2002, pp. 47–48) gives some indication of the substantive breadth of typologies of experiential learning.

Studies have shown that students value authenticity (Kaider and Hains-Wesson, 2015). Viewed through the lens of cognitive psychology, the type of experiential learning implemented has the potential to increase students' attention to the subject matter. While highly complex, it is recognised that the more salient, or personally or situationally meaningful the content, the more learners will pay attention (Weinstein, Sumeracki and Caviglioli, 2019c). In this way, experiential learning in the form of live briefs potentially affords both personal and situational interest for learners: the relevance is personally meaningful, because it is based on current and future professional interest. Situational saliency can be enhanced in a number of ways, and notably through social activities where students have opportunities to carry out research that is then shared amongst learners (Hidi *et al.*, 1998 cited in Weinstein, Sumeracki and Caviglioli, 2019c p. 55), and this would seem to occur organically in cross-disciplinary live briefs.

2.3.5 Key benefits of experiential learning

Other sections highlight benefits associated with experiential learning theory more generally as well as those afforded to live briefs. This section considers studies which highlight other key benefits, including enjoyment, improved development of cognitive knowledge, the development of students' soft skills, including reasoning, as well as institutional benefits.

Dewey (1938) refers to the 'agreeable' nature of experiential learning, but this is not used to suggest that enjoyment or interest is a goal. Enjoyment, however, is cited by several studies in higher education which reported on students' ready engagement with experiential learning activities. This was expressed in terms of both enjoyment and

satisfaction (Gundala, Singh and Cochran, 2018; Kondratjew and Kahrens, 2019; Park *et al.*, 2020; Sebby and Brown, 2020; Sherman and Botkydis, 2020). Enjoyment is seen as a positive affective state; as per earlier discussion, students' affective state is seen to be important to their engagement with learning. There is also a pragmatic benefit in offering experiences that are seen to be enjoyable. In the UK, results from the National Student Survey figure within most league table calculations and performing well with 'student satisfaction' is accordingly recognised as important. Universities spend considerable time and money to ensure that they perform well in metrics, notably the NSS (Trowler, Ashwin and Saunders, 2014). It is perhaps for this reason that approaches that are seen to be enjoyable are featured as part of university's marketing as well as supported pedagogically, as seen in the section on live briefs.

Several studies point to the benefits of deploying experiential learning in higher education in relation to the development of cognitive knowledge. While experiential learning might be more naturally associated with complex social problem solving, there are also reported benefits for subject related problem solving as well. An experimental study using a control group that looked at accountancy students' problem solving ability found that, when comparing direct instruction with experiential learning, those learning using experiential approaches performed better (Hulaikah *et al.*, 2020). A similar approach was used in a quasi-experimental study with nurses, and results indicated that using an experiential design enhanced learners' evidence-based practice (Park *et al.*, 2020). And, when combined with other recognised strategies derived from cognitive psychology, the recognised benefits of experiential learning in knowledge retention also appear to be enhanced (Kondratjew and Kahrens, 2019).

Depending on the type of experience, studies suggest that experiential learning supports the development of a range of soft skills (Sherman and Botkydis, 2020). These include team work and communication (Kim, 2019; Richardson, Stenquist and Stenquist, 2019). Studies also appear to suggest that experiential learning can enhance the development and retention of affective behaviours, such as social responsibility (Caulfield and Woods, 2013). An interesting finding from several studies on the theme of challenge, which might be popularly framed as 'resilience' is that students and staff suggested that there were increased levels of 'enjoyment, satisfaction and self-confidence', with the latter particularly

expressed in conjunction with overcoming challenges (Sherman and Botkydis, 2020, p. 84). This may be because experiential learning provides opportunities for learners to try new skills and get feedback in a 'safe environment' (Moody, 2012, p. 17). Safety when addressing challenges is also mentioned as a positive feature in other studies as in, 'the opportunity to try out and fail without causing damage'. This would depend on the type of experience, clearly, as cases where experiential learning involves working with external organizations brings increased risk where things go wrong (Fitch, 2011).

Experiential learning has also been associated with abduction, or abductive reasoning (Taataila, 2010; Johansson and Rosell, 2014; Scott, Penaluna and Thompson, 2016), and this has a particular value as a knowledge-generating tool for learners (Fischer, 2001).

'Abductive reasoning is the process of generating hypotheses, theories or explanations and precedes deductive and inductive reasoning'; as such, it has been described as a combination of the two (Karlsen, Hillestad and Dysvik, 2021). It has been defined as, "hypotheses on probation" that are defeasible, i.e. can be substituted if more promising ones can be found' (Gold *et al.*, 2011, p. 231). It is sometimes expressed in other ways, such as 'fuzzy logic' and is defined by uncertainty or the notion of a best guess, which again denotes the lack of the firm grounding associated with either inductive or deductive reasoning (Mirza *et al.*, 2014).

There is some criticism that this type of reasoning overvalues explanation as opposed to prediction, which may be seen as undesirable as a final outcome (Stogsdill, 2021) but the notion of process rather than product is salient in experiential learning. Used 'conservatively', abductive reasoning proposes avenues for progression within complex subjects where they may be adapted as new information comes to light (Tsaih, Lin and Ke, 2014). This can be seen as ideal within learning experiences and it is seen as a particularly valuable form of reasoning for novices (Mirza *et al.*, 2014). For this reason, the abductive process is seen to have synergies with experiential learning, where the motivated learner can continuously propose solutions to emerging challenges presented in real-world experiences (Taataila, 2010).

Finally, experiential learning activities are seen to afford specific benefits to students in higher education, but they are also seen to benefit staff and organizations. These benefits are brought to the forefront when external organizations are involved. Supporting or

participating as part of experiential learning activities are a means of keeping academia abreast of competencies and skills for employers (Gundala, Singh and Cochran, 2018), and this may enhance the way in which staff work to develop and deliver the curriculum. Working locally, these can strengthen links to the community (Sebby and Brown, 2020) and universities can benefit from esteem and improved relationships.

2.4 Live briefs

Live briefs, sometimes called live projects, are offered by a number of universities (Chiles and Till, 2004; Anglia Ruskin University, 2021; UAL:London College of Fashion, 2021). As per the introduction, live briefs involve projects where students work on an agreed outcome for a client or user. Live briefs are organized through the university and replace or complement more typical activities such as lectures or seminars.

While a considerable body of grey literature on the use of live briefs is available, there is limited material published on their use. As would be expected, live briefs are seen to have a number of benefits in common with experiential learning, such as enjoyment and the development of soft skills including communication, but with the additional benefit of empowerment through interactions with 'real' clients (Chiles and Till, 2004). However, live briefs also share features with other constructivist approaches, including work-based learning, participatory design and capstone learning. This section examines how different theories intersect within live brief projects, resulting in rich experiential learning.

Because of the externality of working with a client, live briefs offer a type of employment context typical of work-based learning. Work-based learning, or workplace learning, are used interchangeably by the QAA and are defined as 'learning that takes place, in part or as a whole, in the context of employment' (QAA, 2018). The interchangeability of the terms suggests that place is perhaps less important than the notion of an employment context.

Work-based learning provides rich opportunities for learning and development in part because of opportunities for informal learning. Informal learning might include conversations with peers on how to approach an aspect of a project or observation of another individual or group undertaking some aspect of learning. These types of opportunities are seen to make up the majority of learning but are most often overlooked in terms of their value. Seminal research on the value of informal learning in the workplace

suggests that between 70-90% of all workplace learning is informal but is treated ‘as an only occasional by-product’ (Eraut, 2011, p. 12). This is consistent with views of development of the affective domain, seen to occur largely through a ‘process of socialization with the participation of parents, teachers, professors. An informal environment is extremely significant’ (Savickiene, 2010, pp. 44–45).

Participatory design is also a significant feature of live briefs (Christiansson, Grönvall and Yndigeñ, 2018). Participatory design is broadly seen to involve ‘all relevant stakeholders as active contributors into the design process’ (Pelliccia *et al.*, 2021, p. 122). In education, participatory design can be used interchangeably with co-design, and actively involves students as stakeholders in the design of their learning experiences (Martens *et al.*, 2019). While staff may also play an important role in increasing ‘the likelihood that the right lessons are conveyed’ (Denton and Papp, 2019, p. 652), students take a slightly different position within live briefs, because they play a key role in deciding what the final output will be. This type of approach aligns well with partnership approaches valued across the national context in higher education, as established in the introduction. The support from other students and academics is an important feature of any student-led learning, as academics and peers play a key role in supporting those students who are less enthusiastic or unwilling to engage with challenges that can emerge during the initial weeks of a new study experience (Herrington, Oliver and Reeves, 2002).

Live briefs share many of the same features as capstone projects. In a capstone project, ‘the curriculum departs from the traditional specialized training and emphasizes working collaboratively across conventionally defined academic disciplines’ (Jiji, Schonfeld and Smith, 2015, p. 188). While they focus on a particular discipline, capstone project experiences enable students to draw on and deploy a range of skills and knowledge from different subject areas.

There is some empirical evidence that taking part in broad, multi-subject projects enhances learning, but not in higher education. One of the largest randomized control trials in the areas of what is called project-based learning (PBL) to develop multiple literacies was carried out in the U.S with school-aged children. The study addressed concerns that holistic projects that combined multiple literacies (science, mathematics, literacy social and emotional learning) result in less learning than if subject areas are studied in isolation.

Carried out across 46 schools, the results concluded that students in the 23 schools that employed the multidimensional project-based approaches scored measurably higher on both assessments of science and social and emotional learning when compared with the 23 control group schools (Krajcik *et al.*, 2021).

Given their capacity to support a culminating experience that draws together different skills and knowledge, capstone learning projects are considered particularly valuable in preparing students for employment (Healey *et al.*, 2013). Capstone projects are most often deployed at the end of a period of study, such as a final year project; however, given their ability to foster ongoing development and deep learning, it is suggested that their use should be more widespread (Milner, 2017).

From a theoretical perspective, live briefs are situated in a type of theoretical crossroads. Live briefs embody elements of work-based learning, participatory design and capstone learning. The complex nature of briefs mean that they also feature characteristics of other constructivist approaches, notably problem-based and discovery learning, but these are broadly touched on in other sections.

2.5 Criticisms of experiential learning

Experiential learning should not be romanticized, and literature suggests criticisms from both student and staff perspectives.

Critics question the broad approach to evaluating the efficacy of experiential learning, suggesting that there is little evidence of enhanced cognitive gain and that these types of approaches can be particularly problematic for novice learners. Researchers from cognitive psychology similarly warn against ‘feel good’ learning that academics might intuitively believe holds value. Finally, the experiences themselves are seen to present challenges to students and academics alike.

2.5.1 Criticisms of constructivist approaches

The main criticisms of experiential learning are notably captured in the work of Kirshner, Sweller and Clark (2006). The authors address the perceived shortcomings of ‘constructivist, discovery, problem-based, experiential, and inquiry-based teaching’. They justify this grouping of approaches by suggesting that these share the characteristics of ‘challeng[ing] students to solve ‘authentic’ problems or acquire complex knowledge in information-rich

settings [...] second, they appear to assume that knowledge can best be acquired through experience based on the procedures of the discipline' (Kirschner, Sweller and Clark, 2006, p. 76).

Their criticisms are varied, but much of the criticism is firstly levelled at the wide range of reported benefits, leading critics to question what is being measured through research into constructivist approaches (Kirschner, Sweller and Clark, 2006). There is some grounding to the concern of varied measures of effectiveness when considered alongside the breadth of reported benefits through different studies discussed in this chapter. And, while some claim 'extensive and credible evidence suggests that faculty consider a nontraditional model for promoting academic achievement and positive student attitudes' (Prince, 2004, p. 229), even its advocates suggest that there is further space available for research on experiential approaches (Scott, Penaluna and Thompson, 2016).

Kirshner *et al.*'s (2006) main criticism of a lack of empirical evidence seems more legitimate if the studies claimed enhanced cognitive learning, most of which do not, and it is the reported affective learning that is difficult to capture with metrics. It must nonetheless be acknowledged that some of the other claimed benefits do not consistently translate to more positive metrics for universities. For example, one large scale study looking at the perceptions of alumni suggested that alumni did not see a clear relationship between experiential learning and subsequent employment (Tiessen, Grantham and Cameron, 2019). This study used a definition of experiential learning that was very broad, but as an empirical study, the results urge caution in any assumption that perceived benefits will translate to measurable impact. There is also research that suggests that, while valued, experiential learning does not translate into higher grades and this suggests a contradiction between the perceived effort applied and the final grade outcome (Ahmad and Nauman, 2020). While again, it is not necessarily claimed that the main benefits of experiential learning are cognitive development, it highlights what may be a significant issue for students.

Kirshner *et al.*'s second major criticism is their concern for the misapplication of minimally guided learning, particularly where novice learners are concerned. While they highlight that this group may be unfairly challenged by the perceived minimal guidance in some approaches, they further conclude that 'even for students with considerable prior knowledge, strong guidance while learning is most often found to be equally effective as

unguided approaches' (p.83- 84) (Kirschner, Sweller and Clark, 2006, pp. 83–84). This underpins their claim of 'overwhelming and unambiguous evidence that minimal guidance during instruction is significantly less effective and efficient than guidance specifically designed to support the cognitive processing necessary for learning' (Kirschner, Sweller and Clark, 2006, p. 76).

Kirschner *et al.*'s critics formulated a formal response which challenged their interpretation of the evidence base as lacking (Hmelo-Silver, Duncan and Chinn, 2007). The response further underlined their concern about the grouping of distinct pedagogical theories, and the assumption that all would be considered 'minimally guided' when it is recognised that most are highly scaffolded (Hmelo-Silver, Duncan and Chinn, 2007, p. 99). Dewey's own insistence on the role of organization, much of which mirrored Biggs (2003) and Bloom *et al.*'s (1956) views of learning design, in experiential learning does not seem to be noted. This seems to be an oversight on the part of Kirschner *et al.*, given that the importance of support for learners in immersive experiential environments is considered essential (Herrington, Oliver and Reeves, 2002; Fitch, 2011), even to the point that it becomes a resource issue for academics, as will be discussed. The suggestion that teaching staff might therefore leave students virtually to their own devices was at odds with practitioners' experience with these approaches.

This article was followed up some time later with a second publication that sets out a case for 'fully guided instruction' (Clark, Kirschner and Sweller, 2012) where Kirschner *et al.* (2006) further differentiate between the needs of expert and novice learners, particularly in relation to cognitive load. Cognitive psychologists underline the importance of recognising cognitive load when planning and implementing teaching activities; cognitive load theory underlines that using some attention to accomplish a task means that there is less available for other tasks (Weinstein, Sumeracki and Caviglioli, 2019a). In the light of the authentic nature of tasks discussed earlier, it is apparent that there will be additional cognitive load for students engaging in experiential learning. Scaffolding, then, is seen to play an essential role in reducing cognitive load: 'Initially the scaffold helps learners acquire skills that they would be unlikely to acquire without the assistance. The scaffolding helps to minimize the extrinsic load so learners can focus their resources on the intrinsic demands of the learning'

(Schunk, 2012, p. 224). If these approaches are not scaffolded adequately, then there is concern that learners will feel overwhelmed.

Alongside criticisms of types of constructivist learning, it should be highlighted that experiential learning is recognised as a form of learning that holds academic value. The QAA's explicit support of accreditation of prior experiential learning (APEL) highlights the recognised value of 'learning and achievement [...] not in the context of formal education and training' (QAA, 2018). The QAA also caution against the oversimplification of learning gained through experience, and that experiential learning such as on work placement 'cannot be captured in simple metrics of study time' (Quality Assurance Agency for Higher Education, 2013, p. 6). Using APEL, however, students quite literally gain academic credit for their experience, based on its robust evaluation in conjunction with intended module learning outcomes.

2.5.2 Overlooking evidence-based approach in favour of intuition or powerful anecdotes

It is suggested that there is a disconnection between cognitive psychology and applied education that has resulted in a lack of evidence-based approaches being deployed effectively in teaching practice. This is perhaps most effectively argued by Weinstein, Sumeracki and Caviglioli (2019). Their work draws together cognitive psychology and teaching, and proposes that the latter is often mistakenly based on incorrect intuition or, at worst, engenders approaches that emerge from marketing. In relation to this latter point I draw the reader's attention to my own experiences of being involved in the activities related to our placement strategy and graduate attributes in the introduction.

Weinstein *et al.*'s (2019) work acknowledges the challenges faced by already busy educators in making sense of and then applying research from cognitive psychology in their teaching. In an attempt to address this, they highlight and model evidence-based strategies to support learning (Weinstein, Sumeracki and Caviglioli, 2019d). These include:

1. Spaced practice with interleaving: a strategic distribution of learning over time in conjunction with 'interleaving' different types of learning on the same subject in different orders
2. Concrete examples: using concrete examples for abstract concepts or using relevant illustration in conjunction with text

3. Retrieval practice: regularly returning to concepts through activities that enable students to practise remembering, and scaffolding with prompts

Their work is extensively underpinned by research in the field of cognitive psychology and the above summaries are necessarily simplified, something which the writers themselves caution against in application. At a glance, there are clear overlaps with some theories of learning, such as the use of scaffolding.

While there is scope to embed the strategies underpinned by cognitive psychology highlighted by Weinstein *et al.* (2019) in experiential learning, only one study was identified that deliberately did this. The work of Kondratjew and Kahrens (2019) combines experiential learning with spaced learning. While relatively small scale, this research highlighted the potential of combining strategies that are grounded in educational theory and supported by research with approaches that have emerged from cognitive psychology. In the study, two groups of students participated in experiential learning, with one group additionally engaging in Spaced Learning. Participants valued the interactivity and the authenticity afforded by the experiential component of the study; in terms of cognitive development, the addition of spaced learning enhanced the improvement or retention of knowledge (Kondratjew and Kahrens, 2019). These findings point to the unique but potentially less measurable benefits of experiential learning in the affective domain as well as confirming the significant existing research on spaced learning.

Read in context, the case made by Weinstein *et al.* for including evidence-based approaches for the development of cognitive knowledge is well made. There is no attempt to engage with the affective domain, and the strategies outlined relate to learning discrete subject-specific content which is then tested in some type of examination format. Kolb's earlier-noted statement on learning, however, provides a more holistic context in which cognitive psychology might be implemented in practice: 'To learn is not the special province of a single specialized realm of human functioning such as cognition or perception. It involves the integrated functioning of the total organism- thinking, feeling, perceiving and behaving' (Kolb, 1984, p. 31). There is a place for evidence-based approaches, but these must be considered alongside wider sectoral priorities for development in the affective domain outlined in the introduction.

2.5.3 Student and staff: acknowledging negative perspectives

Many of the positive and the valued elements of experiential learning that have been discussed, including authenticity, enjoyment and the development of soft skills, dominate the literature in the area. There are also difficulties and negative perspectives that must be acknowledged. In addition to concerns related to measurable impact on students' development, it is suggested that authenticity, valued by some students, may create unwanted challenge for others. From an academic perspective, there is also some concern about the resource needed to facilitate experiential learning and from an institutional perspective, cost may be an issue.

For students, experiential learning presents a significant difference from other more familiar types of learning. This includes a shift in responsibility and power which is more equitably shared between student and academic (Patil *et al.*, 2020). While established models of learning that include a more participatory or partnership approach are valued in the higher education sector, these may not be welcomed by all students. Particularly when they are faced with 'unknowns', students may additionally feel unhappy or disenchanted:

'frustration can arise simply because of the similarity of these authentic learning tasks to the kind of uncertain and messy tasks that people are often required to do in their professional lives' (Herrington, Oliver and Reeves, 2002, p. 284). A completely different mode of teaching may leave students feeling unwelcomingly thrust into the unknown; these students 'value process-focused teaching around their assessment, which offers explicit explanation, modelling and opportunities for practice before submission' (Green, Hammer and Star, 2009, p. 10). In relation to live brief experiences, the client is an extra stakeholder that presents an additional unknown and unpredictable factor; simply put, students' valuing of such a challenge cannot be assumed (Fitch, 2011).

Several articles also point to burdens or preoccupations of academics in offering or facilitating experiential learning. As noted, experiential learning offers a more diverse experience but there may be significant extra work for the academic involved. Dewey himself notes the additional challenge of 'instituting a much more intelligent, and consequently more difficult, kind of planning [...] The planning must be flexible enough to permit [...] individuality of experience and yet firm enough to give direction towards continuous development' (Dewey, 1938, p. 58).

Where live briefs involve interdisciplinary working, as they are often seen to do, these are also seen to require more of academics, who must be willing to take on the additional work involved and be confident in supporting students beyond their unique areas (Jiji, Schonfeld and Smith, 2015). And, with any live brief, there is the added burden of trying to bring the real work into the confines of a module, which has a predetermined timeline that is rigid (Christiansson, Grönvall and Yndigegn, 2018), again requiring more of academics' resources. In the light of the unpredictable and authentic nature of experiential learning, a significant amount of work, too, is seen to be invested in the development of a much-valued 'safe' space for learners (Kisfalvi and Oliver, 2015). Depending on the experience offered, experiential learning can also be expensive (Lesgold, 2001; Moody, 2012; Caulfield and Woods, 2013). Coupled with the 'hidden labour' involved in setting up more innovative types of learning experiences, the potential risk involved in trying different or less explored approaches might mean that practitioners may be put off trying them (Gordon and McKenna, 2018).

One of the few studies focusing exclusively on educators' views of experiential learning involved a large scale study of 24 focus groups in China (Bell and Liu, 2019). For some academics, the perceived loss of control over learning, the move away from 'objective' measures of learning and their faith in the students to play an active role in their learning were of major concern. Academics involved in the study also had concerns around what students might think about a non-traditional approach to learning: 'students might not engage and learn what they should; lose interest and not learn; think the activities were just games' (Bell and Liu, 2019, p. 218). While these concerns may be to some extent rooted in different cultural expectations of learning, these again highlight the importance of not assuming that experiential learning will be valued by all educators.

2.6 Approaches to investigating experiential learning

It is suggested that there are three main categories of research in experiential education: those with a focus on input, such as the participants or type of context; those that focus on process, in terms of how these are implemented; or those that focus on outcome, typically centered on benefits (Allison, 1999 *cited in* Allison and Pomeroy, 2000, p. 95). Most research is focused on the latter, seen as part of an overall trend in education research, where there continues to be significant growth in studies that seek to demonstrate the effectiveness of

educational approaches (Allison and Pomeroy, 2000; Outhwaite, Gulliford and Pitchford, 2020).

A review of research on the impact of experiential learning in higher education indicates that a variety of methods are used. Most draw on qualitative self-perceptions of undergraduate students or recent alumni in a variety of formats, including questionnaires or interviews (Fitch, 2011; Caulfield and Woods, 2013; Gundala, Singh and Cochran, 2018; Wilson, Yates and Purton, 2018; Richardson, Stenquist and Stenquist, 2019; Tiessen, Grantham and Cameron, 2019). Others use both student and staff perceptions (Sebby and Brown, 2020; Sherman and Botkydis, 2020) or staff observations of students (Kim, 2019). Experimental design using a control group is less frequently used (Kolb, 1984; Kondratjew and Kahrens, 2019; Hulaikah *et al.*, 2020; Park *et al.*, 2020), some use both testing and qualitative approaches, and still other studies have looked at students' reflective comments in assignments (Ruholl and Boyajian, 2007).

As has been seen, many of these approaches rely on self-reporting methods. These are viewed as cost effective, but imperfect (Randles and Cotgrave, 2017). This is because learners' perceptions of their learning can be inaccurate (Hagá and Olson, 2017) and this may particularly be the case when it comes to grade outcomes (Ahmad and Nauman, 2020). My chosen methodology does involve self-reporting, as per the next section, but this is seen as appropriate to the aim of the research, which is to examine student and staff perceptions of an experiential project in higher education in the context of intended learning outcomes.

2.7 Literature: in sum

This chapter began with a consideration of how the literature review was undertaken, and the way that wider reading shaped the research aim. The first part of the chapter provided a comprehensive background to how domains of learning are understood in higher education, highlighting a somewhat reductive implementation of what is commonly referred to as 'Bloom's'. The literature suggests that the way that outcomes-based approaches rely on cognitive knowledge development may deter academics from including activities that focus on other domains, notably affective learning domain.

The second part of the chapter discussed the origins of experiential learning and highlighted the importance of planning and organisation within this type of learning, suggesting an enhanced role for academics that may be seen as uncomfortable in contrast with other

more traditional types of teaching. As a particular type of experiential learning, live briefs exemplify one of its key benefits: authenticity. As established in the introduction, there is an increasing expectation for universities to develop the employability of students through their studies; meaningful, real world activities may be facilitated through experiential learning. There are, however, a number of criticisms of experiential learning, with concern that a lack of direction may leave novice learners, in particular, overwhelmed. The chapter concluded with a brief review of how experiential learning has previously been investigated by other researchers in higher education, which naturally leads to Chapter 3: Methodology.

3 Methodology

This chapter begins by engaging with philosophical assumptions as they relate to this research and my beliefs as a researcher and education professional. The examination of ontological and epistemological perspectives provides a means of grounding the method, which takes advantage of the flexibilities of case study research to engage with course documentation alongside student and staff focus groups.

3.1 Research assumptions

Unlike the practicalities of carrying out research, which are explicit, deeper philosophical discussions are most often left unarticulated in published academic work. Engaging with these underlying issues is, to some extent, what sets a doctoral thesis apart from other research types (Byrne, 2017). Some philosophical grounding of research is also seen to denote its quality. In their attempt to capture how quality may be assessed in applied and practice-based educational research, Furlong and Oancea (2005) suggest a framework that includes 'paradigm-dependent criteria' (Furlong and Oancea, 2005, p. 12). Its inclusion within the quality framework implies that the explicit discussion of paradigmatic assumptions is a valued component of research.

Four philosophical *assumptions* are recognised: ontology, epistemology, axiology and methodology (Creswell, 2013, p. 20). The belief system, or world view, that captures the assumptions of ontology, epistemology and methodology is referred to as the research paradigm (Guba and Lincoln, 1994). Ontology may be defined as 'the branch of philosophy concerned with the existence and the nature of things that exist' (Williams, 2016, p. 154). In literature, definitions of ontology are often seen to include the word 'real' or 'reality' (Allison and Pomeroy, 2000; Willis, 2007; Creswell, 2013; Ormston *et al.*, 2014), because ontological assumptions are concerned with the nature of what is real. Within a research context, this involves looking at how reality is mediated by the ways in which the researcher interacts with it. If ontology is intrinsically linked with reality, it is difficult to consider ontological assumptions without linking them to epistemology. Epistemology is 'concerned with the nature, sources, and limits of knowledge' (Mathison, 2011, p. 129), and ways that reality might be known.

There is some argument that the laborious engagement with paradigms is an unnecessary distraction from the research process. As one critic suggests, '...there is no good reason to

believe that there is some single description of the world that patient inquiry might someday unearth that will depict what the basic categories of the world are and indeed must be so that at long last we will have discovered the ultimate nature of reality... To think we can do anything like this is a wild philosophical conceit' (Nielsen, 1991, p. 263).

Bryman rejects 'doctrinaire posturing' in favour of a methodology that will, in his words, 'generate good research' (Bryman, 2003, p. 171). Nonetheless, literature is full of such posturing: the phrase 'paradigm wars' (Tashakkori and Teddlie, 1998) is used to capture the vigour with which different perspectives are expressed and defended. As one author observes, 'the research world can often seem to be divided into camps' (Allison and Pomeroy, 2000, p. 9). The language around paradigms is divisive as well as judgmental. It is most often implied, but sometimes explicit, that one must choose a side, and certainly students in different disciplines may be taught to be on the 'right' side (Plowright, 2011, p. 1).

As a new researcher, reticence (including, admittedly, my own) for engaging with philosophy may be attributed to a reluctance to enter into a discussion that is not only complex but contentious. Paradigms are the subject of significant debate, deeply connected to individual belief systems, with each containing their own truth. As such, developing an understanding of philosophy as part of research may present an unwelcome challenge to student researchers. In the words of one author, a consideration of these underpinnings 'may put students off philosophy for life' (Willis, 2007, p. 9).

Forming and understanding personal epistemologies may be further complicated by the fact that these can develop and change over time (Walker *et al.*, 2012). My earliest research, in secondary school, familiarized me with positivism: science lessons taught me that the truth was something to be observed, like the boiling point of water. Observation of something led to proof that something was true. Positivism sees knowledge as a single reality, observed through the senses where the researcher has little or no impact on the research process (Willis, 2007). When applied to more social realities, however, positivism has limited applicability. Learning metrics may themselves be considered positivist (Bamber and Stefani, 2015) and my questioning of metrics to some extent helped me to recognise what I did not believe about the nature of reality.

In the face of complexity and contentiousness, there is an urge, perhaps, to oversimplify. Quantitative research is often equated with a positivist paradigm that sees a single, discoverable truth and qualitative study is similarly often equated to interpretivist paradigms. This in itself is what Bryman (2003) also characterizes as an ‘assumption’ (Bryman, 2003, p. 171). A concept that has resonated with me from an early point in this research was something Dewey (1938) proposed in his work: his criticism of the *Either-Ors* (p. 17). As in: everything is black or white, traditional or progressive, positivist or interpretivist. Dewey both understood both the natural tendency to align wholeheartedly with a particular perspective, and the impracticality of doing so. It is in many ways far more complicated to take a nuanced perspective, so it is with some relief I am able to point to my discipline as a means to sidestep the more rigorous debate of having to align with a particular ontological perspective. Education is an inter-disciplinary subject. Accordingly, it draws on research approaches from a range of disciplines (Creswell, 2013; Frey, 2018). Paradigms, too, can comfortably co-exist. For any piece of research, there may be more than one paradigm that is defensible (Given, 2020), meaning that paradigms are selected for context and aim, rather than holistically applied across research. For this research, I am using an interpretivist approach, not to suggest that it is superior, but because it is appropriate to this research.

3.1.1 Establishing assumptions

The explicit consideration of philosophical assumptions establishes a shared starting point with the reader. ‘It is the job of philosophy to scratch beneath the surface of ‘agreed meanings’ –the ‘self-evidently true’ pronouncements- and to show that life is much more complicated than is assumed’ (Pring, 2010, p. 56). Practical decisions on method are based on assumptions that will influence the research and its interpretation. It is not the data itself that defines qualitative or quantitative research, as is often suggested, but the paradigmatic assumptions (Willis, 2007).

A natural suggested order would be to recognise or develop a world view and then select the research approach (Al-Ababneh, 2020). However, it would be disingenuous to imply that any explicit philosophical realizations had taken place prior to planning the practicalities of approach. Instead, it was a consideration of *what* I considered worth finding out and *how* that enabled me to determine what I believed or understood at a philosophical level.

It is suggested that qualitative research approaches are, necessarily carried out by researchers who 'embrace' the idea of multiple realities (Creswell, 2013), a concept that I have come to appreciate through my career as an educator. When teaching, I see on a daily basis how the same 'facts' are viewed, interpreted and discussed in a way that is touched by their source, communication or by a student's background. Each of us has a different life experience that shapes how the same reality is perceived.

While positivism seeks proof, interpretivism seeks evidence and accepts its imperfect nature. Research is reductionist. As Bryman suggests, the whole process of analysing data is 'fundamentally about data reduction' (Bryman, 2012, p. 13). This is in part why there is an acceptance that social reality that emerges from research will never be completely accurate (Ormston *et al.*, 2014). I can accept the imperfect nature of the reported perceptions and my own impact on the research process, but still recognise the value that the research has in contributing to wider understanding in relation to the aim of the research. As established, learning itself is exceptionally difficult to measure (Robertson, Cleaver and Smart, 2019). While learning may in part be visibly captured through end-point assessments, there is another part that remains invisible and unique within the learners themselves. Using an interpretive approach has enabled me to engage with the multiple realities of the students' and staff perceptions of learning and consider these alongside the intended learning outcomes.

I was also determined to use an approach that would provide me with the answers that I sought without becoming mired in philosophical debate, which pragmatism provided. Pragmatism 'seeks ways through the polarized [...] debate to find practical solutions to the problem of differing ideologies and methodologies' (Grbich, 2013, p. 27). Popularized by Dewey and Peirce, pragmatism prioritizes the research question over more searching questions of ontology (Williams, 2016). Peirce's writing offers the example of trying to determine the truth of whether an object such as a diamond is hard or soft: what is true is what is felt when it is touched, and not what might be conceived of as hard or soft in its untested or untouched state (Peirce, 1982). Pragmatism suggests that there are not superior methodological approaches and that decisions are less helpfully linked to philosophy but more usefully dependent on the research question as it is posed and the phase of the research (Tashakkori and Teddlie, 1998). As a busy practitioner, there is real

appeal in a philosophy that is focused on ensuring rigour and less concerned with philosophical debate.

A final area of consideration are the axiological or value-based assumptions. From a paradigmatic perspective, axiology is concerned with the ethical context (Daniel, 2016) and involves 'explicit consideration of the concept of ethical behaviour in relation to the research, the participants, the data and audience' (Kivunja and Kuyini, 2017, p. 28). To attempt a 'value neutral' approach that might be possible in other disciplines would be ethically wrong (Carr, 2010, p. 50), and as established, I have taken care to ensure a reflexive approach to the research. As an education practitioner, I felt it was also important to use processes of data collection that would both provide the answers I was looking for and also fit with my role as an educator. This informed my decision to use focus groups, for example, as outlined in the method, because these enabled student and staff reflection as well as providing data for the research.

3.1.2 Qualitative case study research

While data can take a variety of forms, there are often seen to be two types: 'numerical and narrative' (Plowright, 2011, p. 119), referred to as quantitative and qualitative. At a superficial level, qualitative research is text data as opposed to numerical data, although it can also draw on other material, such as film or sculpture (Flick, 2007). As per the earlier discussion of paradigms, however, qualitative research is defined by its assumptions as opposed to the type of data.

This research uses qualitative text data from three sources as part of a case study:

1. Module descriptors for modules that formed the basis for the live brief activity
2. Mixed focus groups with students who have worked on a live brief (Computing and Creative Arts)
3. Mixed focus groups with staff who have supported the live brief (Computing and Creative Arts)

As has been observed, 'it could be argued that any research in social science is a case' (Cohen, Manion and Morrison, 2018, p. 375). Creswell (2013) acknowledges that while there may be some dispute over scope, case studies are a type of methodology that are defined by 'a real-life, contemporary bounded system [... considered] over time [...] involving

multiple sources of information' (Creswell, 2013, p. 97).

Creswell's reference to 'bounded' highlights the importance of framing what is included as part of the case study, and what is not. This case study research frames the implementation of two different live briefs over two academic years. Using two consecutive years has widened the breadth of available data, meaning that the views are not attached to a single type of live brief.

Creswell's definition also highlights the use of different sources of data. Because of the variety of types of data that might be collected, case studies afford consideration of multiple perspectives within a specific context (Lewis and McNaughton Nicholls, 2014).

Consequently, case studies facilitate different sources of data available in a learning environment to be viewed together as part of a whole (Best and Kahn, 1989; Bassey, 1999; Kondakci and Van, 2009; Chapleo and Simms, 2010). In this research, a holistic perspective is achieved by bringing together key stakeholders in the learning experience, students and staff, and considering their perspectives on the live briefs in conjunction with the intended learning outcomes. The juxtaposition enables the comparing and contrasting of what the learners and staff thought about the live brief experience with what was intended as per course documentation.

4 Method

This section outlines how the qualitative case study approach was operationalized. As an educator, I sought data that would both answer the research aim and have the least potential impact on the planned processes of learning and teaching. I achieved this by using existing programme documents as the basis of document analysis and focus groups, which were a potential opportunity for reflection and consolidation of learning. I provide a justified examination of each of these types of data and their treatment through the research process and conclude discussion of the ethical considerations involved in the research process.

4.1 Data: module learning outcomes

In each of the two years of the case study, a live brief formed the main learning and teaching activity across five different modules: 2 from Computing, and 3 from Creative Arts.

The validated documents that underpin the modules are called module descriptors.

Descriptors act as a formal statement of intent, and include general information on what

students should know or achieve on completion (QAA, 2018). As such, these formal documents were an important data source, because they set out the intended learning outcomes.

A document analysis was carried out on the intended learning outcomes. As well as providing me with the information needed to contextualise the perspectives of students and staff, my rationale for including document analysis was twofold. Document analysis does not intrude on participants in any way, and it is a form of non-reactive research (Bowen, 2009). As an educator, I was committed to approaches that would have limited impact on learning and teaching activity. Accessing the publicly available module descriptors does not impact on these. Their non-reactivity was also a benefit. Non-reactive research refers to practices that remain unaffected by the research process (Neuman, 2014). The module descriptors provide a relevant and formal record of what learners are expected to learn from the modules, through the intended learning outcomes. These publicly available documents do not 'react' to my access or analysis, and this limits my impact as a researcher on these as a source of data.

I took the early decision to analyse only the intended module learning outcomes. As discussed in the introduction, learning outcomes are the formal statement of what students should learn through their study. Other sections, such as indicative content or assessment are written necessarily broadly to prevent them from becoming outdated, and as such, these were less useful. I did not undertake any analysis of graduate attributes as these were not included on three of the older module pro formas.

Knowing what was promised or intended from the modules provides insight into the starting point for design. The intended learning outcomes provide essential context for the examination of students' and staff perceptions of learning.

4.2 Learning outcome analysis

There were a total of 15 learning outcomes across five modules (see Figure 1)Figure 1: :

Learning outcomes from across the modules

1. Evaluate, articulate and apply a sound understanding of the complex parameters of a range of data structures, in order to interrogate a given problem*
2. Interpret and implement a software design that incorporates data structures*
3. Critically analyse a given scenario to determine the most appropriate data structure/s to be use
4. Critically evaluate the structures and intentions of major Design Patterns
5. Implement Design Patterns in one or more object-oriented language
6. Evaluate, from requirements specifications/definitions, and propose Design Patterns appropriate to application architecture and implementation*
7. Assimilate research methods, craft skills, personal visual language and relevant media into graphic design project work
8. Demonstrate competence in applied and industry-relevant graphic design studio skills
9. Use contemporary design software and technology to solve creative problems
10. Assimilate research methods, craft skills, personal visual language and relevant media into illustrative project work
11. Demonstrate competence in applied and industry-relevant studio skills
12. Use contemporary design software and technology to solve creative problems
13. Demonstrate a fluent assimilation of technique, style and media in graphic project work
14. Demonstrate applied and industry-relevant graphic studio skills in a variety of formats
15. Develop creative solutions using contemporary design software and technology

*Only the first verb was used for the purpose of analysis.

Figure 1: Learning outcomes

Learning outcomes were analysed by coding them to two different taxonomies in order to position them in relation to a domain of learning:

1. Anderson *et al.*'s revised taxonomy (Anderson *et al.*, 2001)
2. Atkinson's Taxonomy Circles (2013)

I firstly chose to code against Anderson *et al.*'s revised taxonomy (2001) because of its established use across the HE sector (Newton, Da Silva and Peters, 2020). Atkinson's Circles

offered an alternative taxonomy that recognised more contemporary forms of learning, namely the use of computer software (Atkinson, 2015). Seen as a holistic taxonomy (Suto *et al.*, 2020) Atkinson's Circles is one of a limited number published with sufficient detail for practical application (Greatorex and Suto, 2016). Atkinson has continued to adapt this taxonomy on a personal website, but I chose to code to the older version because it is the version referred to as having been reviewed (Suto *et al.*, 2020) and is cited in academic literature, if only in a limited way (e.g., Iwasiw and Goldenberg, 2015; Greatorex and Suto, 2016; Suto *et al.*, 2020).

Before deciding on an approach to the analysis of the learning outcomes, I looked at how other researchers had carried out similar mapping activity across classifications of learning. Rogaten *et al.*'s (2018) large scale study, which categorized studies of learning gain into cognitive, affective and behavioural, involved testing codes with five researchers. A sample was then double coded with a small discrepancy noted in the rate of agreement. Using the established and tested codes, the remainder were then coded by one individual with clarifications as needed with a second individual (Rogaten *et al.*, 2018). In a second study of mapping learning outcomes to different domains, Atkinson (2015) himself coded independently, and provided the details of the coding process.

Coding in isolation is seen to be a limitation (Fereday and Muir-Cochrane, 2006). While I did not have a team as per Rogaten *et al.*, I involved an experienced colleague with 7 years of practice as an academic developer specializing in curriculum development. Bringing in a second individual was also seen as a means to increase the reliability of the process. In the context of coding, reliability refers to consistency of the judgement, as opposed to verification, which is seen as a positivist concept (Boyatzis, 1998). Because of the small number of learning outcomes to be categorized, I did not have the same scope to develop and test consistency in the way that I would with a larger data set. Involving a second coder provided an alternative way to promote consistency with this small data set.

4.2.1 Coding process

The language around coding, like much of the language in literature on research, is used differently to mean different things. Spencer *et al.* (2014) cite differences in the use of *theme* or *category*, for example, but suggest not to 'get bogged down in semantics but to grasp basic aspects of the analytic process' (Spencer, Ritchie, *et al.*, 2014, p. 278), a view

shared by others (Gibbs, 2011). For clarity, in relation to the coding of learning outcomes to domains, I use *map*, *code* and *categorize* in the same way.

I began by preparing a document with a list of all learning outcomes and two coding frameworks:

Coding to Anderson *et al.*'s revised taxonomy (2001): Code descriptions were taken directly from definitions of the dimensions as defined by Anderson *et al.* (Anderson *et al.*, 2001). Coding was then carried out in the framework itself. That is to say, I used the blank template of the framework included in Anderson *et al.*'s (2001) book (Appendix 8.5.4), then pasted the learning outcomes into the relevant section of the framework to determine the cognitive process category (Appendix 8.5.3) and knowledge dimension category (Appendix 8.5.2).

Coding to Atkinson's Circles: Code descriptions were taken from definitions of the of the dimensions as defined by Atkinson (2013). I then created a table with the learning outcomes on one side, and a space for assigning a code on the other (Appendix 8.7).

As per the results, some of the learning outcomes had more than one verb. In this case, I used the first verb only. While there was a case for trying to determine the intention of the learning outcome, I felt this would add an extraneous layer of interpretation.

Throughout the analysis process, I was aware of the need to remain reflexive in my approach and sought to avoid conflating any of my preconceived ideas of what I would find with the coding process as is discussed at the end of this chapter. Having independently coded using my templates, I provided my colleague with a list of the learning outcomes and the same templates (blank) that I had used myself, along with copies of the relevant taxonomies for reference.

I compared the coding results, and discrepancies in coding were recorded. I organized a collegial discussion to review any differences in the assigning of codes. A negotiated final code was then assigned, following much the same process as described in the study by Rogaten *et al.* (2018), but on a smaller scale.

4.3 Focus groups: participants

The participants included students and staff involved in two different live brief projects over two consecutive years. As per **Error! Reference source not found.**, a total of 92 students

and staff were involved in the live brief projects over two academic years. All students and staff came from Computing and Creative Arts. The live briefs presented a novel way of working across disciplines for both students and staff.

While participation in the live brief project was an embedded part of the teaching activity for the modules involved, participation in the research (i.e. focus groups) was voluntary. Approximately half of those involved in the live brief projects took part in the research, for a total of 12 focus groups or 47 participants (see Table 1 Table 1: Participants).

The participation levels differed between students and staff: 38 of 83 students participated (46%) compared with 9 of 11 academics (82%). This might be considered at once a limitation and an ethical success. As per the limitations section, to have less than half of the students participate in the focus groups must be considered as a contextualizing factor in the results. Equally, it is reassuring that students understood the voluntary nature of the research given the pressure that students might feel when an academic is seen to lead research as per the ethics section.

Year	Number involved in live brief	Focus groups
Year 1 2016	43 students 5 staff	21 students (6 student groups: Groups A- F) 4 staff (1 staff group: Group K)
Year 2 2017	39 students 6 staff	17 students (4 student groups: Groups G-J) 5 staff (1 staff group: Group L)
Total	93 participants	47 participants

Table 1: Participants

Because participants were invited to take part in the research activity based on their involvement in the live brief projects, they may be referred to as a purposive sample. Purposive sampling involves using participants because they fulfil defined inclusion and exclusion criteria (Daniel, 2014). The sample may equally be described as ‘convenience’, because it draws on participants who are easily accessible (Bryman, 2012); in this case, I have a relationship with the university where the live briefs were undertaken. It is common for postgraduate students to carry out research using existing networks (Plowright, 2011). While I refer to the limitations of this approach as an academic in reflexivity, this enabled me to reach out to the participants through my existing relationship with the university.

4.4 Focus groups

Focus groups, known as a nominal group technique, is an approach involving a group of individuals where perceptions or thoughts on identified issue(s) are elicited (Fry, Ketteridge and Marshall, 2015). These are more than a form of group interview, because they build shared knowledge through interactions (Finch, Lewis and Turley, 2014). Focus groups are seen as ideal for research with students (Barbour, 2005; Breen, 2006; Brandl *et al.*, 2018) both because these can play a role in recognising the student voice as part of the learning experience, and because other methods, such as questionnaires, might receive limited attention. Because of the context-specific nature of focus groups, the findings must be acknowledged as context specific, and not generalizable to other universities (Breen, 2006).

4.4.1 Organisation of focus groups

Because the students were organized into groups as part of the project, these same groups were used as the focus groups. While there is some suggestion that mixing participants across hierarchies can facilitate meaningful discussion and knowledge creation (Clavering and McLaughlin, 2007), student and academic staff focus groups were carried out separately. I felt this was important to ensure that both groups felt that they could speak freely among peers.

The decision to keep students in their working groups for the focus group, however, was primarily practical: from an ethical perspective, there is a need to avoid intruding on participants' time and lives when carrying out research (Webster, Lewis and Brown, 2014). Because focus groups were organized during scheduled groupwork activity time, all participants would be available in the same time and space. These were carried out in an empty seminar room as opposed to some of the shared working spaces used in the live brief project. Those who chose not to take part in the research component did not come to the dedicated space to avoid any sensitivity that they might feel for having decided not to take part. The focus groups were carried out at the end of the project, once key project deliverables had been provided and presentations to the client made. While this meant that the focus group provided only a single census point, it took place at a time where students and staff had a perspective of the experience as a whole.

4.4.2 Facilitation of focus groups

There are 'many different options [to successfully conduct a focus group], and for each research project investigators need to select a way of using focus groups that matches the goals of the project' (Morgan and Bottorff, 2010, p. 579). Accordingly, I carried out the focus groups in a way that recognised my ethical obligations and drew on my skills as an education professional.

Following introductions, and as per the ethics section, I ensured that students were aware of my role as a researcher and reiterated information already provided regarding the research and particularly the right to withdraw. Prior to asking questions, the focus groups included the recommended welcome, an overview of the area of investigation, and a statement of confidentiality (Breen, 2006). I ensured that students and staff knew that the focus group was being recorded and that it would be anonymized on transcription, at which point there would no longer be the option to withdraw.

Facilitation of the discussion itself involved drawing on my skills as an education professional in higher education. As set out in the UK Professional Standards Framework for HE, promoting 'equality of opportunity for learners' is a core professional value (Higher Education Academy, 2011, p. 3). Because the interaction between group members is the defining feature of a focus group, it is essential that the facilitator fosters a balanced and inclusive discussion (Franz, 2011; Finch, Lewis and Turley, 2014). Franz (2011) suggests that simple follow up questions may be effective in ensuring that there is opportunity for a range of views to be expressed, rather than moving immediately on to the next topic. As a qualified teacher, I was trained to use pauses as well as probing questions. Pausing and making eye contact with the group provides opportunities to speak, but also opportunities to think (Shanmugavelu *et al.*, 2020), and using these techniques can foster thoughtful contributions as well as inclusivity.

In the light of some of the power issues outlined in the ethics session, an almost unstructured approach was deployed in order to provide students, particularly, with opportunities to guide the direction of the discussion. Researchers using focus groups should begin by identifying what they hope to get from the sessions (Breen, 2006). Having accomplished this in the aforementioned introductory statements, the initial question posed in the focus groups was purposely broad: how did they feel that the experience of the

live brief had been different from other types of learning that they had been involved with in higher education? The only other question I included was on learning gain, and how students or staff felt that it might be captured. I had a short list of other prompt questions in cases where conversation flagged, but these were not always deployed (Appendix 8.3).

It is nearly impossible to control all the variables when organizing and carrying out focus groups (Getrich *et al.*, 2016). Indeed, one result of trying to manage variables was that students did not attend the focus group, in two cases leaving a group of two students. Smaller groups are considered ideal from a research perspective as they provide enough space for each learner to provide individual responses of some depth while drawing on and responding to the contributions of others (Lewis and McNaughton Nicholls, 2014); however, having only two students stretched the definition of 'focus group'. I decided to proceed with the questions on the basis that the students had already come to the scheduled meeting and I did not want to waste their time.

4.5 Focus group analysis

The analysis of text data in research can be addressed through thematic analysis or content analysis. Thematic analysis is a tool used by researchers to obtain meaning from qualitative data by identifying themes. In the social sciences, the analysis of text data as a tool to identify themes are often modelled on the approaches of Boyatzis (1998), Braun and Clarke (2006) and Bryman (2012). Themes are the researcher's interpretation of abstract constructs into concrete ideas. These are identified through coding, where the researcher identifies parts of the text that have a similar identified characteristic or meaning, and gives them a name or code. The purpose of coding is to take raw data and produce results that are considered 'partly empirical', by engaging in a process of analysis with increasing intricacy (Ryan and Bernard, 2003, p. 88).

It is well recognised that the treatment of narrative data as part of analysis uses both qualitative and quantitative approaches (Bryman and Burgess, 1994; Willis, 2007; Plowright, 2011). At some point, the researcher will note, for example, that a code or theme occurs more frequently than others, signaling its potential importance. For qualitative researchers, it is important that 'prevalence' is not confused with the notion of 'keyness' (Braun and Clarke, 2006, p. 82). There is merit to this statement, but it does not fully respond to

references to 'recurrence' of themes used in thematic approaches (e.g., Braun and Clarke, 2006).

Because coding requires the researcher to consider the prevalence or recurrence of a particular theme, I decided to adopt an approach that used quantification explicitly as opposed to in a way that was undefined. Content analysis is an alternative process for identifying themes in qualitative data, and also uses a process of coding. However, unlike thematic analysis, which acknowledges the importance of identifying the recurrence of themes but shies away from actively engaging quantitatively with data, content analysis makes active but cautious use of numerical data (Vaismoradi, Turunen and Bondas, 2013).

I selected a type of content analysis called *contextual text coding* (CTC). CTC is a form of content analysis that uses a hybrid deductive-inductive approach to analysing text data, making active and transparent use of quantitative approaches (Lichtenstein and Rucks-Ahidiana, 2021).

CTC was chosen because of two defining features: the first, as noted, is CTC's active and explicit use of quantitative data. This approach sits well with the pragmatic philosophy of focussing on what is needed and, perhaps for this reason, pragmatism is referred to as 'an attractive philosophical partner' for approaches where qualitative and quantitative research are used together (Johnson and Onwuegbuzie, 2004, p. 14). Secondly, CTC has the advantage of transparently making use of deductive and inductive analysis to engaging with data. It is suggested that while qualitative research is 'viewed as a predominantly inductive paradigm, both deduction and induction are involved at different stages of the qualitative research process' (Ormston *et al.*, 2014, p. 24). In essence, I felt that being able to make use of existing knowledge, both my own as an experienced educator and that gained through reading in combination with an inductive approach would afford the most accurate representation of the students' and staff perceptions.

The use of a hybrid approach with both deductive and inductive processes is supported by Fereday and Muir-Cochrane (2006), and there is also significant merit to their proposed model. Unlike CTC, however, Fereday and Muir-Cochrane (2006) use an inductive approach first to review data and identify codes, followed by the creation of a template based on the research question and relevant theoretical frameworks, which is then used to carry out further analysis (Fereday and Muir-Cochrane, 2006). However, having some knowledge of

the subject area as a professional and having engaged with the process of reviewing literature as a starting point as per the literature review, I felt the deductive-first approach would operationalise existing knowledge, as opposed to trying to suppress it.

According to Lichtenstein and Rucks-Ahidiana (2021), the CTC method involves six steps:

1. Data preparation
2. Identification of unit of analysis
3. Identification of codes: firstly using deduction (using existing knowledge of the data and subject) and induction (using a trial run of the initial codes and gaps)
4. Application of the finalised codes
5. Quantification of the data (i.e. adding up coded text to determine prevalence)
6. Quantified data is used to carry out further, targeted qualitative analysis

The actual application of CTC involved more than six steps. This is both because some of the steps CTC uses involve additional stages within them (e.g. as noted, Step 3 involves both inductive and deductive processes), and because coding in general is complex and requires some fluidity between the stages (Braun and Clarke, 2006). The application of the framework of six steps is outlined here and includes details of stages within them.

4.5.1 Step 1: Data preparation

Data preparation

In CTC, data preparation is seen as a significant stage in cases where there are large amounts of data. In the case of this research, existing focus group transcripts were used: 12 student focus groups, and 2 staff focus groups. Focus group transcripts required little preparation until Step 2, in setting up the Excel files.

I also undertook a process of familiarization as part of the data preparation. Familiarization, as the name suggests, is the process of getting to know the data, and is regularly cited as the first step of thematic analysis (Ritchie and Spencer, 1994; Braun and Clarke, 2006; Spencer, O'Connor, *et al.*, 2014; Outhwaite, Gulliford and Pitchford, 2020). Familiarization is not included as a stage within CTC, likely because it purports to be an ideal approach for dealing with large volumes of data (Lichtenstein and Rucks-Ahidiana, 2021).

Approaches described to encourage familiarization are suggestive a more manageable amount of data, as is the case in this research project. Familiarisation quite often happens

as part of the collection process (Thorne, 2000; Suter, 2014). As I facilitated the focus groups, this happened quite organically. Because the focus groups were recorded, I was also able to make notes to myself as the students talked. Both during the focus groups, and immediately after, notes were made as a means of maximising the 'early interaction' advised (Miles and Huberman, 1994, p. 51). While notes may be used to form some initial opinions on the data (Braun and Clarke, 2006), I did not consult these notes as part of the coding process; rather, they served to enhance the listening process to help me focus on what was being said and, consequently, support the process of familiarization.

In this research, there were two periods of familiarisation: the first, using the approaches just described, and a second, following a period of abeyance. Interruptions and delays are endemic in doctoral studies, attributed to a range of factors (van de Schoot *et al.*, 2013; van der Haert *et al.*, 2014; Barnes, 2016). Following a period of abeyance, in order to become refamiliarized with the data all transcripts were printed and annotated. This enabled me to feel that I understood the key features of the data, its diversity and scope, seen to be the main purpose of familiarization (Spencer, O'Connor, *et al.*, 2014; Erlingsson and Brysiewicz, 2017).

4.5.2 Step 2: Identification of unit of analysis

Defining the unit of analysis in CTC involves reviewing the research question to develop 'units' that will provide answers to the question. While actively dividing the text into units is suggested in some approaches to content analysis (Erlingsson and Brysiewicz, 2017), in CTC this is a practical step that informs the way that a processing tool such as a spreadsheet is set up to answer the research question or, in this case, meet the research aim.

I took the decision that units would be the instances where a topic was mentioned as part of a comment, and each transcript would be coded separately. Treating each transcript separately would provide me with insight into individual focus group discussions as well as a view of all the data together. This was achieved by setting up two Excel files: one with worksheets for each of the student focus groups and one with worksheets for each of the two staff focus groups. Every worksheet was set up identically with columns that would then be used to capture instances that each code was mentioned, and 'dummy' codes were used as placeholders ready for Step 3.

Instances	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10
Cat	0	0	0	0	0	0	0	0	0	0
Dog	0	0	0	0	0	0	0	0	0	0
Horse	0	0	0	0	0	0	0	0	0	0
Sheep	0	0	0	0	0	0	0	0	0	0
Goat	0	0	0	0	0	0	0	0	0	0
Squirrel	0	0	0	0	0	0	0	0	0	0
Fish	0	0	0	0	0	0	0	0	0	0
Giraffe	0	0	0	0	0	0	0	0	0	0
Elephant	0	0	0	0	0	0	0	0	0	0
Monkey	0	0	0	0	0	0	0	0	0	0
Hamster	0	0	0	0	0	0	0	0	0	0
Rat	0	0	0	0	0	0	0	0	0	0
Bunny	0	0	0	0	0	0	0	0	0	0
Pig	0	0	0	0	0	0	0	0	0	0
Cow	0	0	0	0	0	0	0	0	0	0
Donkey	0	0	0	0	0	0	0	0	0	0
Rhino	0	0	0	0	0	0	0	0	0	0

Figure 2: Master worksheet with dummy codes

A master worksheet was used in order to facilitate the process of changing code names and enable the total number of instances to be seen at a glance. As seen in Figure 2, the dummy code names were rather nonsensical in the first instance, but using less meaningful terms meant that I did not start to engage with the deductive process until Step 3. The master worksheet collected the number of instances of each code from the other worksheets, using COUNTA functions to calculate the number of extracts listed for each code on each focus group worksheet.

4.5.3 Step 3: Identification of codes

While seen as a single step in CTC, the identification of codes involves several stages: firstly, a list of deductive codes is created. This list is then tested, and the list is modified to incorporate inductive codes.

In CTC, this is accomplished by returning to the research question or aim, and then making a list of codes needed to address it (Lichtenstein and Rucks-Ahidiana, 2021). During the initial deductive stage, I based my codes on themes that had emerged through the literature explored within the introduction and literature review of experiential learning. For example, based on the review of literature, I created a category for abductive reasoning and soft skills, both of which I felt could be important themes. I also created a category for ‘learning’, a shorthand for learning gain which was in place to capture a question that I had asked, ‘Do

you feel that the grade you will receive/have received will reflect all aspects of your achievement?’ (Appendix 8.3).

While the deductive stage made use themes identified from literature, the inductive stage drew on the data itself to generate themes. Inductive reasoning stresses the observational element of research, where generalizations are drawn from observations (Cohen, Manion and Morrison, 2018). In order to test deductive codes and consider codes inductively, I next scanned two transcripts and added codes I felt were important. For example, this activity identified the need to add a code for ‘negative’ in order to accommodate comments of frustration. Three transcripts were then coded and a further code added through the inductive process for ‘positive challenge’. This recognised instances where students had discussed overcoming difficulties in a positive manner.

4.5.4 Step 4: Application of the finalized codes

Before applying the finalized codes, Boyatzis’ (1998) criteria were used to determine the effectiveness of the codes. These included the code itself, a description; a ‘flag’ or way of identifying; qualifications or exclusions to the description, and an example (Boyatzis, 1998), seen applied to ‘Authenticity in Table 2’:

Code	Description	Flag	Qualifications or exclusions	Example
Authenticity	Fidelity to professional life	Real	refers to live brief (not other elements of module)	<i>good experience for actually going out in a real workplace because that’s the kind of thing that you’re going to encounter</i>

Table 2: Defining codes using Boyatzis' criteria

Even with the criteria, there was a significant amount of returning to the codes and some adjustments with the definition, and in the Table 2 example I added ‘actual’ to the flag later. While the ‘recursive’ nature of coding is recognised in other frameworks (Braun and Clarke, 2006), I was surprised given the prescriptiveness of CTC that there was so much fluidity between the steps and many comments were initially coded in several ways while I returned and adjusted codes, replacing the the dummy codes from Step 2.

4.5.5 Step 5: Quantification of the data

The quantification of the data (i.e., adding up coded text to determine prevalence) is where CTC differs significantly from other types of analysis. Having initially considered a type of software designed for coding, using CTC had prompted me to choose Excel, which would facilitate quantification. The use of software is not seen to save time, but can improve the way that data is processed when compared to hand coding (Dey, 1993). As described in Step 2, I had created a series of worksheets for each transcript. Every worksheet was set up identically to communicate with the master front sheet that I used to view the total number of instances for codes.

As illustrated in Figure 3, I put the full transcript down the left hand side. I could then copy and move relevant extracts and position them in the appropriately headed cells for each column. This gave me the flexibility to recode if required because the full transcript remained intact and visible throughout. Moreover, I could view the comments in context as well as individually.

Using Excel was essential for the quantification element of CTC, because as explained it added up the instances for each column. The use of software to facilitate coding can be particularly helpful in searching (Nelson et al., 2018) as well as providing visual cues on the coding process (Kelle, 2013). Excel does not have many features, but it did enable me to search, to allocate different sections of the main text to the appropriate column and highlight text. I found the latter feature helpful when identifying examples at the end of the process of coding for inclusion in the presentation of results.

Full transcript in this column

Master front sheet

Worksheet for each transcript

Chunks of transcript assigned to codes

Codes

	A	B	C	D	E	F	G
1	full transcript	learning	abductive	soft skills	relationships with staff	authenticity	challenge
9	[what did you learn]Yes, I think it was useful because different tasks could be given to different people depending on their strengths.	Yes, I think it was useful because different tasks could be given to different people depending on their strengths.					
10	Well, the computing people did the website stuff and then we did the design, and then we had different tasks to do, each. So, research, and different things like that.			Well, the computing people did the website stuff and then we did the design, and then we had different tasks to do, each. So, research, and different things like that.			
	[It was] good because it gives you actual proper experience with dealing with other people outside of just friendship						Yes. I think so, yes. Firstly, it was something that I haven't done before, because I've done mock-ups and front pages for websites

Figure 3: Contextual Text Coding in Excel

4.5.6 Step 6: Quantified data is used to carry out further, targeted qualitative analysis

It was in this stage that I could, at a glance, see which main codes had emerged. For example, at the end of the coding process, I could see that I had coded the most number for 'Authenticity' and that I had not coded anything substantive for 'Abductive reasoning'. In the CTC method, these trends are then used to return to the research aim and consider how the codes suggest a form of response (Lichtenstein and Rucks-Ahidiana, 2021). I used the codes that had emerged most frequently as a lens to view other codes, and to determine whether I could group codes into main or subthemes.

At this point I was able to identify, for example, authenticity as one of the likely main themes. Because I had used the word 'real' as one of the flags for this, I could also carry out a targeted search using this word. This highlighted the scale of the theme of authenticity. In this final stage there is a pivot away from identified quantitative trends in order to focus on qualitative engagement with the data, and a deeper analysis (Lichtenstein and Rucks-Ahidiana, 2021).

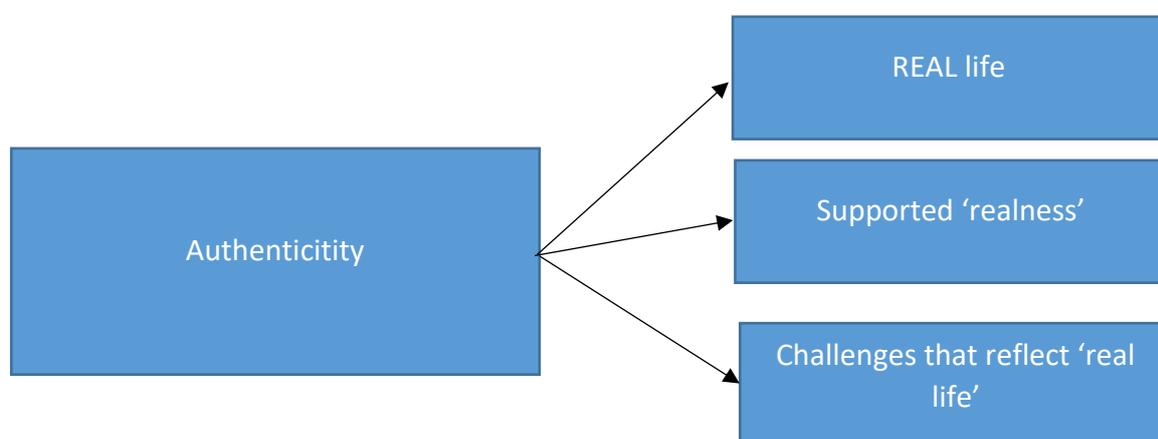


Figure 4: Deeper analysis of themes

As part of this deeper analysis, I started by re-reading comments that I had coded that had received a significant number of instances and put all coded examples together into a single Word document so that I could view them as a whole. On re-reading the comments coded under authenticity, for example, I began to look more closely at the language used, and noted that, as per the results, students tended to use a conditional tense when discussing

reality. I established that students felt like they were supported, and initially used the theme 'supported realness' (see Figure 4). However, as per the Results, I later changed this to 'Authenticity: a scaffolded experience'. Changing the language had two benefits: it enabled me to link the students' comments with staff comments on the level of work involved in facilitating the live brief. The word 'scaffolding' also reflects the language used in literature, making the connections between my own findings and the literature in Chapter 2 more explicit.

This was possibly the longest stage, and the most challenging. I drew various maps to help me to understand the relationships between the codes similar to Figure 4. Maps and diagrams provide a means to engage differently with the data, and are seen to assist both with organisation and the identification of relationships between the data (Ryan and Bernard, 2003; Neuman, 2014). This assisted greatly at the end of the coding process, as I was able to see some of the relationships between the eventual themes and subthemes. While complex interrelationships remained, the creation of a visual map was central in helping to organize the results and discussion.

4.6 Reflexivity in data collection and analysis

Both the module analysis and the use of CTC involved both inductive and deductive analysis. As noted, inductive analysis is defined by its reliance on the data to inform themes without the 'researchers' analytic preconceptions' (Braun and Clarke, 2006, p. 83). In practice, however, it is generally accepted that the codes come both from the data and from the researcher's prior knowledge of the research area or 'a priori' (Ryan and Bernard, 2003, p. 88). I believe that all inductive approaches will have some level of priori influence, and this is probably a significant consideration for any experienced practitioner; as per the discussion of reflexivity in the introduction, it may be an advantage.

In the light of a priori influence, however, there is also the potential to conflate findings with what one hopes to find. It is suggested that at every point of research, but notably during analysis, the researcher should attempt to be self-critical as a tool to guard against bias or influencing results (Elo *et al.*, 2014). As an educator I recognise, for example, my interest and belief in the value of experiential learning.

I used two approaches to minimise the potential for my own views to inform the interpretation of themes: firstly, before coding, I consciously reviewed my own expectations and views of experiential learning. This approach is cited in a description of reflexive analysis by Leedy and Ormrod (2015, p. 344) as a way of ‘confronting [...] expectations [...] to minimise their influences’. A second approach was to re-review each coded transcript actively looking for negative views or comments on experiential learning that would contradict my own expectations. In all cases, the negative views had already been captured through the coding process, but this approach ensured that I actively engaged with unconscious bias.

4.7 Ethics

As it is grounded in education, the British Educational Research Association (BERA) guidance informed the consideration of ethics. BERA (2018) highlights that, as members of the education community, there are additional responsibilities that must be addressed by education researchers alongside those that are common to research in any discipline. The BERA guidance is similar to the ethical guidance at my own university, where I received ethical approval (Appendix 8.1) and gatekeeper permission (Appendix 8.1.1) as per in-house policy (Buckinghamshire New University, 2019). Power differentials that exist between students and members of staff, both real and perceived, are a significant issue for ethical consideration in all research in education. The BERA guidance was therefore addressed with attention to the unique considerations of carrying out insider research as an academic in a university setting. The core considerations relate to the following (BERA, 2018):

- Consent
- Right to withdraw
- Transparency
- Incentives
- Harm arising
- Privacy and data storage
- Disclosure

4.7.1 Informed consent

BERA's (2011) guidance highlights the importance of ensuring that participants have full information on the study as part of the consent process. This must be sensitively handled when carrying out insider research (Humphrey, 2013).

It is considered sensible to assume that potential participants in any research will feel some pressure to take part when asked (Webster, Lewis and Brown, 2014). Using students as participants in research raises legitimate concerns (Roberts *et al.*, 2001; Ferguson, Myrick and Yonge, 2006a; Loftin, Campanella and Gilbert, 2011), primarily because academics are in a position of power.

In order to meet ethical guidance, I gave a short informal verbal information session to the students and staff involved in the live brief. This information session, aimed at providing the 'informed' element of ethical guidance, was given at the end of an organized talk about the live brief. The use of a few minutes of students' time was balanced against the guidance that suggested approaching a group for consent was seen as preferable to approaching individuals, as the latter may feel more pressured by the request (Loftin, Campanella and Gilbert, 2011).

There was a second balance to be achieved in the information session which related to how much information should be provided without leading. The balance between openness and introducing bias must be carefully handled (Carter and Little, 2007). (Carter and Little, 2007) For example, telling students I was interested in finding out what metrics would and would not provide about learning might lead students or staff to think that I was seeking certain types of information. For this reason, the information provided was honest but not leading, with part of the information sheet stating that the project intended to gain, 'a better understanding of how students and staff work together in teams and across faculties and the impact that it might have on learning (Appendix 8.2). The information session also highlighted the following:

- Taking part in the live brief was part of the module. Taking part in the research activity was not.
- The research activity would involve taking part in scheduled focus groups
- All information would be reported in an anonymised way, and stored safely

As well as not leading potential participants, it was important not to overwhelm them. Participants require the full information but should not receive so much detail that they become burdened with irrelevant information (Bradbury-Jones and Alcock, 2010). As previously indicated, I tried to make the processes of data collection through focus groups as unobtrusive as possible, and because the live brief was a new endeavor, this also risked students taking part without their awareness.

In order to ensure information was provided expediently, I also provided a single written information sheet (Appendix 8.2) and consent form (Appendix 8.2.1). The information sheet remained available electronically throughout the duration of the project. This included contact details so that further information could be sought at any later point, and I reminded students of key details at the start of the focus groups (Appendix 8.3)

4.7.2 Right to withdraw

The right to withdraw is fundamental in research and requires careful consideration. For example, there is some indication that it should be possible to 'withdraw from the study at any stage' (Bradbury-Jones and Alcock, 2010, p. 195). Data analysis involves anonymization, however, and once this process begins, withdrawal is a more complicated concept.

Students were told that signing the consent form did not oblige them to take part in a focus group. As noted in the facilitation of the focus groups, students were reminded of the right to withdraw at the outset. They were also reminded that, once transcribed, the focus groups would be anonymized, and it would no longer be possible to withdraw.

4.7.3 Transparency

Transparency has two elements: from the researcher's side, this involves both reflexivity and ensuring that the reader has information needed to understand the practical and thought processes that have informed the research (Given, 2008). I have included both a dedicated section on reflexivity to clarify my role as well as reflective comments in different parts of this thesis where appropriate. A detailed methodology has been set out to ensure transparency of process, and the aim to be fully transparent also informed my choice of analysis, which I chose in part because of its clear processes relating to the use of quantitative data.

Transparency may also refer to the transparency of the research process for the participants. In this research, I was introduced at the outset of the project at a group meeting as a researcher and academic, and full information was provided to participants as part of informed consent.

4.7.4 Incentives

No incentives were used as part of the research process.

4.7.5 Harm arising

The risk of harm in education research is not likely to be on the scale of research in other fields, such as medicine (Brooks, te Riele and Maguire, 2014). Interpreted more broadly, the education researcher is responsible for ensuring that taking part in the research does not harm students' academic success, for example, by taking time that might otherwise be used for study. The onus is squarely on the more powerful individual, or academic, to ensure that students' are protected (Ferguson, Yonge and Myrick, 2004), and this includes protecting their study time.

Avoiding undue intrusion on the lives and activities of participants should be considered in any research (Webster, Lewis and Brown, 2014). In this research, focus groups were limited to 45 minutes as a means of recognising the significant number of other commitments of students.

4.7.6 Privacy and data storage

Privacy is a particular issue for insider researchers, where connections can easily be made once being an insider researcher has been acknowledged (Fleming, 2018), and within it, the related concepts of confidentiality and anonymity.

I have made my own role clear, and actively referred to the publicly available policies, so my place of employment is clear. The reader will notice that I have framed my relationship with the university where the research was undertaken more loosely. Given that I have a working relationship with several universities, not being explicit about my precise role in relation to university where the live briefs took place is my attempt to protect privacy.

Anonymity and confidentiality are an important component of ensuring privacy. However, as participants were advised in the information and consent documents, data was anonymized upon transcription, in that individual speakers' identities were removed and

groups were assigned a generic identity. Beyond protecting privacy, confidentiality is a central consideration for academic writing that is seen to have three other critical functions: protecting from harm; ensuring integrity within the research process; and adhering to expected ethical standards (Baez, 2002).

The first two of these, harm and integrity, are related within this research. Whether real or imagined, the 'harm' might be some unintended consequence for the students or staff to have repercussions based on what they said. For students, this might mean that they feel or receive some negative consequence, such as a poor grade, based on what they say. For example, this might mean that a student suggests that they did not work as part of the team and did little (or, conversely, all) of the work on the live brief. They may feel that this has an impact on their grade. For staff, this might mean that they feel or receive some unintended consequence for reporting the students' engagement with the brief, or lack thereof. In both these cases, they are likely to be guarded in what they say about the live brief project, meaning that the academic integrity of the project would be compromised. I ensured that both the participant information sheet and the introduction to the focus group reminded students that their identities would be protected within any final report. This is very much in line with expectations of adhering to ethical standards and was therefore part of the process outlined in gaining ethical approval.

Practical information on data handling includes ensuring that data is not stored together with names, keeping any participant lists in a locked or secure area and ensuring the transcripts do not include participants' names (Bryman, 2012). All devices that contained sensitive data were stored in a secure area. In order to ensure anonymity, in transferring the transcripts to the Excel worksheets, I removed any names or instances where students or staff referred to others and deleted the originals. While these issues addressed external confidentiality, focus groups present the additional challenge of internal confidentiality. Sim and Waterfield (2019) highlight internal confidentiality as a particular ethical challenge for focus groups,, highlighting the potential for participants to make disclosures about what is said by others in the group, and the researcher has little control over this. The examples provided, however, make references to highly sensitive cases, such as prostitution (Sim and Waterfield, 2019). The subjects under discussion were nowhere nearly as sensitive, but students did at times comment on engagement (or lack thereof) of their peers. Importantly,

however, these were comments that could not impact on grades of others, as the assessment was separate from the live brief experience, and often the negative comments referenced having already reported the incident to an academic. Nonetheless, in hindsight, the preamble to the focus groups could have usefully highlighted not only a reiteration of issues of withdrawal and confidentiality as it would be handled through the research, but confidentiality as an internal issue.

4.7.7 Disclosure

Issues of disclosure are relevant where participants' behaviour or comments are illegal or harmful and should be reported (BERA, 2018). The nature of the focus groups and topic for research meant that this was unlikely to happen. Had information that required disclosure come to light, I would have progressed it through the appropriate university-based systems or the authorities, depending on the nature of the disclosure.

4.8 Reliability and validity

Reliability and validity are well established terms that have emerged from positivist research; accordingly, their application requires some modification in relation to interpretative qualitative research.

Reliability is the extent to which the procedures produce consistently repeatable results on all occasions (Bell, 2005). In other words, reliability is the demonstration that, should the research be carried out in similar circumstances with a similar group of participants, the results would be the same. Even without the challenge of ensuring that the participants and situation are similar, there is virtually no potential to replicate research where the main instrument of data collection and analysis is the researcher themselves (Bryman, 2012). Instead, the criteria by which reliability may be judged in qualitative research includes 'fidelity to real life, context-and-situation-specificity, authenticity, comprehensiveness, detail, honesty, depth of response and meaningfulness to the respondents' (Cohen, Manion and Morrison, 2018, p. 271). Insofar as is possible, this research has been carried out in a way that reflects the realities of students and staff taking part in the live brief, with transparency and integrity.

Validity is the degree to which the indicators of a research concept accurately represent that concept. It is often defined as the extent to which the item or instrument measures the phenomena under investigation (Parahoo, 2014). One of the simplest forms is 'face

validity', which is intuitive: simply put, the methods used to carry out the research will result in findings that are seen to accurately reflect reality (Nassif and Khalil, 2006). Put differently, when reading the methodology, there is a recognisable sense that the methods used will provide the answers sought.

Validity in qualitative studies is complex. Despite widespread agreement on its importance, there is no single conception of validity universally accepted in the scholarly and professional communities, and it therefore remains controversial (Frey, 2018). Because it cannot rely on processes often associated with quantitative approaches, validity in qualitative research instead relies somewhat controversially on rigour of process that is demonstrated, as far as possible, through auditable documentation (Lub, 2015).

In the light of the challenge of ensuring reliability and validity as they are applied in positivist research, I have employed an approach of credibility and trustworthiness. The approaches to research that I have used are firmly grounded in literature to ensure credibility. I have tried to establish trustworthiness through the transparency of the research process and reflexivity. One of the more significant choices in the methods is the use of contextual content analysis, an analytical approach that is associated with 'credibility, dependability, conformability, transferability, and authenticity' but trustworthiness is seen as its main benefit (Elo *et al.*, 2014, p. 1). Its application depends on 'self-criticism and good analysis skills when conducting qualitative content analysis' (Elo *et al.*, 2014). The notion of self-criticism is engendered in reflexivity and the willingness to acknowledge weaknesses, including one's own, in relation to the research process. Reflexivity is therefore associated with validity in insider research, with some suggestion that the validity of the research is reliant on a reflexive approach (Drake, 2010).

5 Results and discussion

The aim of the research was to examine students' and staff perceptions of experiential learning based on their involvement with a live brief project in conjunction with validated learning outcomes as a means of providing contextualized insight. This chapter begins with the latter, the results of the analysis of the intended learning outcomes, before discussing the results of the analysis of the focus groups with students and staff involved in the live brief projects. I felt it appropriate to begin the results section with the analysis of the

learning outcomes, which form the acknowledged 'starting point' for the design of teaching (Allan, 1996, p. 93).

I chose to discuss the results of the analysis of the intended learning outcomes initially in isolation from the focus group results. This enables a more comprehensive and discrete consideration of the findings, which are then included as appropriate within the focus group results. The results from the focus groups are presented and discussed thematically, and a final discussion further facilitates a joint consideration of both sets of data and the relationship between them.

5.1 Coding of learning outcomes

A total of 15 learning outcomes (LOs) from 5 modules were mapped to two different taxonomies, Anderson's revised taxonomy (2001) and Atkinson's Taxonomy Circles (2013). The results are the product of a rigorous analysis described in the methodology, with my own module mapping confirmed by an experienced curriculum developer as part of the analysis process.

Results of coding to Anderson's revised taxonomy

When coded against Anderson's revised taxonomy (2001), 14 of 15 modules mapped entirely to the cognitive domain (Appendix 8.6)

Only one intended learning outcome mapped to the metacognitive knowledge category:

Assimilate research methods, craft skills, personal visual language and relevant media into illustrative project work

The use of the phrase 'personal visual language' is seen to require some reflection on what is personally valued within visual language. This positions the learning outcome within the metacognitive knowledge category. As per the literature review, Anderson *et al.* (2001) suggest that the metacognitive knowledge category is unique as it is seen to link both cognitive and affective types of knowledge.

Results of coding to Atkinson's Taxonomy Circles (2013)

When coded against Atkinson's circles, there was an almost even distribution between those learning outcomes that coded to the Cognitive Domain (7 of 15 learning outcomes) and those that coded to the Psychomotor Domain (8 of 15) (Appendix 8.7).

Module analysis: discussion

There are several key points of discussion to be taken from the analysis of the learning outcomes against Anderson *et al.*'s revised taxonomy (2001) and Atkinson's Taxonomy Circles (2013). Firstly, the task of categorization is subjective, and influenced by the quality of the learning outcomes themselves. Secondly, the results suggest that the use of the sector-dominating Anderson *et al.*'s revised taxonomy (2001) in the analysis of learning outcomes impacts on how learning outcomes are categorized. Finally, the results suggest that affective learning outcomes are not well represented in the sample coded.

The activity of coding and assigning categories provides a starting point for discussion. The task of categorization is not an intended result, but it has a bearing on the results and is therefore included here as part of the discussion. The process of interpreting learning outcomes is subjective both because of the impact of an individual's interpretation of a learning outcome and because of the quality of the outcomes.

As per the method, the analysis of learning outcomes was carried out in a way that attempted to limit subjectivity. Minor differences in interpretation suggest that there is nonetheless a subjective element when interpreting learning outcomes. When coding against the revised taxonomy (Anderson *et al.*, 2001), 13 of 15 learning outcomes were mapped identically by both myself and the other individual. When coding against Atkinson's Circles (2013), 12 of 15 were mapped identically. These differences are well within the limits of similar types of studies (e.g. Rogaten *et al.*, 2018) and the results are therefore considered robust, allowing for the subjective nature of the task.

The method also highlights that differences were discussed in order to determine an agreed category. There should be some consideration, however, of why differences existed in the interpretation. Differences should, to some extent, be expected, and attributed to the inexact nature of learning and how it can be articulated. This was noted by Bloom *et al.* (1956) who acknowledged that they had not 'succeeded in finding a method of classification which would permit complete and sharp distinction amongst behaviours' (Bloom *et al.*, 1956, p. 15). Anderson *et al.* (2001) and Atkinson (2013) faced the same challenge. From this activity, it is suggested that, regardless of the intention of the learning outcome, there will be some subjectivity in how it is interpreted and then taught by academics, and how it is subsequently interpreted and approached by the students themselves.

A related point is that of the clarity with which the learning outcomes were written, which also impacted on interpretation during analysis. Existing literature emphasizes that, in order to be effective, learning outcomes must be clearly written and measurable (Gudeva *et al.*, 2012). When analysing the learning outcomes, it was noted that several did not meet this standard. From a list of 15 outcomes, 3 learning outcomes had more than one verb.

Examples of problematic outcomes include the following:

- **'Evaluate, articulate and apply** a sound understanding of the complex parameters of a range of data structures'
- **'Interpret and implement** a software design that incorporates data structures'

In such a small sample, this finding is not significant in itself. However, it is consistent with literature that suggests there is significant variation in the quality with which learning outcomes are written (Atkinson, 2015; Meda and Swart, 2018; Newton, Da Silva and Peters, 2020). The use of multiple verbs affects both the clarity and the interpretation of the learning outcomes because it is difficult to know if the verbs should be equally treated or if one is perhaps more important. As per the methodology, a decision was taken to analyse using only the first verb for clarity, but again this was a matter of interpretation.

The issue of subjectivity and consistency of learning outcomes is acknowledged but perhaps underexplored in the sector and in literature given their role. Learning outcomes are central to the Quality Code for Higher Education (2018) as they are central to ensuring the consistency of standards and supporting the effective design of delivery (Newton, Da Silva and Peters, 2020; Cleaver and Mclinden, 2021). Within an outcomes-based system, learning outcomes are the starting point for curriculum development (Allan, 1996), and relied upon for the design of constructively aligned teaching activities and assessment (Biggs, 2003b). Students will be assessed against these learning outcomes, and the resulting metric is important to the student as well as other stakeholders. The subjectivity with which these are viewed, in part influenced by their quality, is therefore a significant finding in itself.

A second key result from the analysis of the learning outcomes is that the use of the sector-dominating Anderson *et al.*'s revised taxonomy (2001) in the coding of learning outcomes situates these overwhelmingly in the cognitive domain. In contrast, when learning outcomes

are categorized using Atkinson's Circles (2013), there is a more even distribution of intended learning outcomes between the Cognitive and Psychomotor domain.

In context, the results confirm that the use of Anderson *et al.*'s revised taxonomy (2001) has some influence on how learning outcomes are viewed more broadly; that is, the use of a taxonomy that is predominantly cognitive results in the interpretation of learning outcomes as being predominantly cognitive. As per the introduction and literature review, Anderson *et al.*'s revised taxonomy (2001), popularly referred to as 'Bloom's' is an exceptionally influential model in higher education (Newton, Da Silva and Peters, 2020). Most academics will be taught to use this model in the development of learning outcomes. In the light of the results of the learning outcome analysis, it is suggested the use of Anderson's revised taxonomy to design learning outcomes may have a similar impact as it has done on the retrospective mapping: that is, the use of a cognitive-dominant taxonomy to develop learning outcomes is always going to result in cognitively-dominant learning outcomes. This might offer some additional explanation to accepted assertions that learning and teaching, as expressed through intended learning outcomes, focusses on the cognitive domain (Shephard, 2007; Hyland, 2011; Atkinson, 2013).

The juxtaposition of two different taxonomies afforded a different lens through which to consider learning outcomes rather than to exclusively focus on Anderson *et al.*'s revised taxonomy (2001). However, different types of knowledge are expected from students on graduation to ensure work-readiness, as expressed through graduate attributes (Bridgstock, 2009; Green, Hammer and Star, 2009; de la Harpe and David, 2012; Hill, Walkington and France, 2016; Gurukkal, 2019) and set out in the Framework for Higher Education Qualifications (FHEQ) (Quality Assurance Agency, 2014). The results suggest the need for a more holistic engagement with both dimensions of Anderson *et al.*'s revised taxonomy (2001), with more active deployment of the metacognitive knowledge category.

There is also space to consider alternative taxonomies and their relevance to contemporary learning and teaching. Atkinson's model was in part created in recognition of 'the need to incorporate a wider range of taxonomies than just the dominant notion of the cognitive' (Atkinson, 2013). In some ways, Atkinson's use of Dave's Psychomotor taxonomy (1967, 1970) reflects some of Bloom *et al.*'s (1956) initial thoughts on the significant role of awareness in learning. In particular, both Atkinson and Bloom *et al.* observe that the rise in

complexity happens in parallel with a rise in awareness in the cognitive domain, but there is an inverse relationship with awareness in the psychomotor domain (Bloom *et al.*, 1956; Atkinson, 2013).

Atkinson's model also merits consideration on the basis that it has actively considered learning in higher education contexts as it happens now. According to Atkinson (2013), the psychomotor domain should be reconsidered in order to reflect the use of technology in learning. This is seen as particularly important in vocational courses where there is often a need to combine psychomotor and cognitive learning (Ramlee *et al.*, 2020), of which there are many in my own university. Atkinson (2015) suggests that the lack of perceived relevance of the psychomotor domain is attributed to the narrowness with which this domain is viewed, and asserts that learning involving computer software- as many of the outcomes analysed did- should be positioned in the psychomotor domain. The learning outcomes are from courses that are heavily reliant on technology: Computing, Creative Advertising, Graphic Design and Illustration. It is unlikely that other disciplines' results would reflect a similar balance between the cognitive and psychomotor domains, but the application of a different taxonomy lens is seen to lend a different interpretation.

Finally, the results suggest that affective learning outcomes are underrepresented in the sample reviewed. Across five modules, only one appears to have a module learning outcome that coded to Anderson's metacognitive knowledge category, seen to be a bridge between the cognitive and affective domains (Anderson *et al.*, 2001) and none were coded to Atkinson's Affective domain. These results are consistent with literature that suggests that affective learning is underdeveloped in education (Ringness, 1975; Brett *et al.*, 2003; Brownell and Jameson, 2004; Boyd, Dooley and Felton, 2006; Birbeck and Andre, 2009; Matthews, 2010; Neuman Allen and Friedman, 2010; Hyland, 2011; Immordino-Yang and Damasio, 2011; Kiener, Green and Ahuna, 2014; Bandaranaike and Willison, 2015; Grawemeyer *et al.*, 2017; Salzmann, Berweger and Ark, 2018; Ilonen and Heinonen, 2018), and notably underrepresented in learning and teaching in higher education (Beard, Clegg and Smith, 2007; Shephard, 2008; Savickiene, 2010; Buissink-Smith, Mann and Shephard, 2011; Atkinson, 2015; Rogaten *et al.*, 2018). As previously stated, affective learning is seen as essential in light of expected graduate attributes, and there is 'urgency' for work that will support its inclusion (Rogaten *et al.*, 2018, p. 13). The final report of the Office for Students

learning gain research recommends that affective measures be included in measures of learning gain (Howson, 2019).

In the light of the importance of learning outcomes as the starting point for design, the lack of affective learning outcomes is at odds with recognition of the importance of affective learning.

5.2 Focus groups

Students' and staff perceptions of the live brief project were captured through focus groups. As per the methodology, the focus group transcripts were coded using contextual text coding (CTC). CTC involves some quantifying of themes as a means to engage actively with recurrence, prior to further targeted analysis and coding. The final themes here are presented in terms of their significance much as they would be in thematic analysis. That is, the actual quantity of a certain theme is not reported, because quantification forms an early part of the analysis process and is not an end result.

Three key themes emerged from the analysis of focus group transcripts:

1. Authenticity
2. Learning
3. Affective dimension

I refer to the affective dimension as opposed to the affective domain as a means of separating it from Bloom *et al.*'s (1956) original definition and including other, broader interpretations of affective learning. While the affective dimension would seem to naturally be a subtheme of learning, I took the decision to treat the affective dimension separately. This is because of the substantial number of comments that emerged in relation to affective learning; to position it as a subtheme of learning would not reflect its prominence.

Having deliberately separated the themes as part of transcript analysis, I found the process of assembling results to require a significant amount of recontextualizing. I have organized this chapter around the three main themes and conclude with a discussion that considers the relationship between the themes as well as broader implications of the results from the focus groups.

Each of the main themes includes an introduction, where subthemes are identified, and a conclusion that summarizes the results. Within each main theme, the treatment of subthemes facilitates a more detailed discussion:

1. The subtheme is introduced
2. Examples are provided with contextual comments
3. The subtheme is discussed in relation to existing literature, with signposting to overlaps with other themes as appropriate

This format of framing the results enables both a discrete discussion of the main and subthemes and recognises their multistranded and overlapping nature.

5.3 Authenticity

As noted in the literature review, there is a conceptual alignment between experiential learning and authenticity (Knobloch, 2003), and its prominence as a theme would seem to confirm this. Authenticity can be attributed to the nature of the live brief projects, which involved a negotiated project with an external client delivered by cross-disciplinary groups of Computing and Creative students.

Authenticity is both a prominent theme and an attribute that is considered valuable in higher education. It would be an oversimplification, however, to suggest, that the experience was perceived as unvaryingly positive for all students. This is seen in the discussion of subthemes of idealized 'realness', scaffolded experience and the challenge of the unknown.

5.3.1 Authenticity: idealized 'realness'

An important element of authenticity is the notion of realness, seen as the extent to which aspects of the live brief reflect students' future working experiences.

One of the most common words used in the focus group transcripts was a variation on the word 'real'. Both students and staff most regularly used the words 'real' or less commonly 'actual' to indicate that they viewed the project as authentic. Comments such as '*putting us in the shoes of a real developer, 'real life', a 'real brief' a 'real project' and a 'real client', or 'actually got a client' and 'actually going out there, developing it'*' highlight the regularity and breadth of the theme. The frequency of comments from both students and staff on the authenticity of the live brief experience indicates that it was seen as a prominent feature of

the experience and valued. It is notable that, superficially, comments on authenticity made by students and staff using the word 'real' or 'actual' were uniformly expressed as a positive feature of the live brief experience.

Contextualized examples

Students' and staff comments in relation to 'realness' most often involved the experience of cross-disciplinary working groups and working with a client on a live brief.

Students commented most regularly on their cross-disciplinary working as being authentically representative of their working lives, seen in the following typical comments:

[It was] good because it gives you actual proper experience with dealing with other people outside of just friendship groups or whatever. You actually are working with people you don't necessarily know but you have to make sure that the work is just as solid as it should be regardless (Group B, 2016).

And

I think it's good experience for actually going out in a real workplace because that's the kind of thing that you're going to encounter, working with a different team, whether that be creative advertising or design or whatever it may be (Group B, 2017).

Staff commented frequently on the authenticity of working across disciplines, but commented with slightly more frequency on the authentic benefits of working with a client, as seen in the following comments:

...the fact that it was a live brief dealing with a real client, that was invaluable (Group K, 2016).

And

To have a real client brief [...]you know, constraints and with fixed deadlines to work has enormous benefits for them (Group L, 2017).

Idealized realness: discussion

The participants' comments are consistent with the nature of experiential learning as established in literature, recognised for affording authenticity (Knobloch, 2003; Denton and Papp, 2019) which is valued (Kaider and Hains-Wesson, 2015). The characteristics of the live brief activity mirror many of the acknowledged features of authenticity, including collaboration (Herrington, Oliver and Reeves, 2002). The students may have commented more on collaboration in mixed peer groups because this represented more of their time, as

the visits with the client occurred with less regularity than their cross-disciplinary working. Staff may have commented more on the benefits of working with a client because this is where most of the organizational and administrative work occurred, but certainly literature also recognises the benefit of empowerment through interactions with 'real' clients (Chiles and Till, 2004).

It is clear, given the prominence of the theme, that authenticity is valued. However, given its inclusion in uniformly positive comments, the 'realness' is seen to be a somewhat idealized attribute of authenticity. The types of comments suggest that, on the surface, live briefs are a type of 'feelgood' learning experience which is to be viewed, justifiably, with caution (Weinstein, Sumeracki and Caviglioli, 2019b). As per some of the other subthemes, once students and staff started to unpack the experiences in more detail, it is apparent that authenticity is far more complex and not always positive.

5.3.2 Authenticity: scaffolded experience

Although students and staff regularly used the word 'real', an examination of the language used in relation to the comments suggests that students believed that this was not the same as the 'real' world of their professional futures. Students' and staff perceptions indicate that both groups are aware of the significant scaffolding required to support the live briefs.

Contextualized examples

Students' awareness of scaffolding is seen in two ways: the nuanced use of language and comments on the input of academics.

An examination of the language used suggests that students recognised the scaffolding and support offered by staff as they worked on the live brief. This is seen in a number of comments that deployed a Type 2 conditional, as in the following comment:

It was really good to work with other people, and be involved, and to actually see what a real life project would be like (Group H, 2017).

The student's use of 'would be' implies that they did not see the project as a true reflection of the unsupported reality they would have in their working lives. This is more explicit in the following comment:

... after this year we're going into actually working so this is a nice little simulation of what that would be, especially seeing as our brief was actually real (Group F, 2016).

The reference to simulation suggests a type of safety net to the live brief experience. Students also recognised the scaffolded support that staff provided in relation to their delivery of the brief. Students did not regularly talk about academic staff, but there were peripheral comments about being guided or steered by them as they worked on the live brief, as seen here:

But we had our tutor sort of setting up [...] so we could have a chat with them in case we didn't have time during our own time. So it sorted us out (Group E, 2016).

Another example can be seen where a student indicated that although they received direction, they still felt they had the opportunity to make the final decision:

Group F: I think it was the freedom to be expressive, to be creative with your own ideas. We were told at one point that virtual reality [...] was going to take too long. We basically scoffed in the face of that and did it anyway (Group F, 2017).

For their part, staff comments indicated that there was a significant amount of scaffolding needed, and the live brief projects were reflected on as 'resource-demanding' by one academic. The support needed seemed in many ways to show that staff were involved in activities that went beyond more traditional teaching, such as the preparation involved in ensuring students were ready for an organized local walk with the client as part of a scoping activity:

I do remember we went to great lengths to prepare them for the [local walk]. We asked them to prepare questions, to pose questions as well and we followed up after the field trip (Group K, 2016).

Another member of staff referred to the management required to run this type of project:

I think purely the amount of people involved, students involved, brought a number of different ideas, ways to implement the solutions. That in itself was a benefit. Also, [a] potential difficulty because you had to manage all those ideas (Group L, 2017).

The scaffolded experience: discussion

As per the many of the comments in the previous and other subthemes, a lot of the contributions seem to focus on the fact that students liked or enjoyed the live brief experience. And, while enjoyment is cited as a feature of experiential learning (Gundala, Singh and Cochran, 2018; Kondratjew and Kahrens, 2019; Sherman and Botkydis, 2020), as Dewey (1938) notes, enjoyment is not an end product, and activities must be planned and supported carefully to promote learning.

The role of academics in providing effective scaffolding for experiential learning is significant, and this is acknowledged in literature (Dewey, 1938; Hmelo-Silver, Duncan and Chinn, 2007), particularly in relation to live briefs (Christiansson, Grönvall and Yndigegn, 2018). This is seen as particularly important in the first weeks of the project (Herrington, Oliver and Reeves, 2002). The allusion to *'the amount of people involved, students involved'* is also suggestive of the work involved in coordinating or supporting live briefs that are interdisciplinary, also seen to increase workload (Jiji, Schonfeld and Smith, 2015). And, with any live brief, there is the additional workload involved in working within the confines of a module timeline (Christiansson, Grönvall and Yndigegn, 2018).

While students did not seem aware of the workload involved in the delivery of the live brief experience, their comments indicate that they were aware of the support that they had. This reflects literature on experiential learning which suggests that it provides opportunities for learners to try new skills and get feedback in a 'safe environment' (Moody, 2012, p. 17). Students' awareness of support is evidenced in the nuanced use of language. Students' comments also show that they recognised the role of academics in guiding and supporting their work, and many of these comments suggest that there was a participatory design element to interactions between students and staff. Participatory design actively involves students as stakeholders in the design of their learning experiences (Martens *et al.*, 2019; Pelliccia *et al.*, 2021) and are seen to be a feature of live briefs (Christiansson, Grönvall and Yndigegn, 2018). Students references to having the *'freedom'* to make their own choices suggests many felt that they had a voice in the direction of the project. This type of activity aligns well with the values of partnership supported by key organizations in the sector including the NUS (National Union of Students, 2015) and QAA (QAA, 2012).

5.3.3 Authenticity: the challenge of the unknown

Experiential learning is challenging in part because of the nature of the tasks, which are seen in some cases to lack the clear definition that is often associated with more traditional formats of learning. Students engaged with a client as well as a new type of module structure, both in terms of the format of experiential learning and working with students from another discipline. This created a number of 'unknowns'. The reality of engaging with these challenges received mixed views from students: the majority of students appeared to

enjoy the challenges they faced, but a number of students expressed negative views of the unknown.

Contextualized examples

Not having complete information on the task and end product presented a significant unknown for students. It was most often viewed as a positive, if challenging, attribute of their experience as seen in the following comments:

I like the fact that we had a real brief and the fact that it changed just like a real brief would [...] nothing goes to plan and I think that really showed in this project, nothing goes to plan. Like you can have a perfect plan, it's perfect on paper but you get into the real world and it's a whole other story. I think that's a big thing that for one I enjoyed [...] It just brought me back to the real world sucks a little bit but you get through it (Group A, 2016).

And

...that was the best bit, was just the working on something where you weren't just told, "This is what you have to do [...]". It was more like you get your end goal and you have to actually work toward it. You would probably have to think [like that] in a real world situation where you're not just given the exact answers (Group C, 2017).

Not all students were motivated by the authenticity afforded by unknowns. Some students appeared frustrated and unhappy by the limited information they had at the outset.

If we found out from day one what we have to do because at least that way we can start from day one, regardless if we have a client or not, what we have to actually do. So that was the biggest challenge because if we don't know what we're going to do it's delays and delays and delays and causes a lot of issues in the long term as well (Group G, 2017).

Staff comments suggested that they recognised that students wanted more information, and there was work involved in helping them (students) to understand their role in the process:

Some of them were wanting a brief that basically tells them what to build, but it was getting them to understand, 'Well, actually, there's a real problem here to solve, and there are a multitude of ways that it can be solved' (Group L, 2017)

They observed that, particularly in the beginning, some may have felt out of their depth as a result:

At the beginning when we had the [initial meeting with the client], I get the impression maybe a lot of them didn't really know what was going on with the module yet. They didn't really get it (Group K, 2016).

Overwhelmingly, though, staff were very enthusiastic about the unknown nature of the briefs, which they saw as a valuable form of authenticity as seen in the comment:

...there are lots of moving parts and lots of unknowns and it's very organic, which is great...(Group K, 2016)

Authenticity and the challenge of the unknown: discussion

As per the literature review, a loosely defined task is typical of experiential learning (Herrington, Oliver and Reeves, 2002) and although the students were given a client brief at the outset, this shifted and was modified by the client as the projects progressed.

Affording students opportunities to engage with risks and change is a recognisable feature of some types of experiential learning (Beard and Wilson, 2002) and seen by staff as an important feature of the live brief. The students' views were largely positive, and they were articulate in outlining that it was the ill-defined nature of the task that they both enjoyed and found authentic, as seen in the comment '*the big thing that for one I enjoyed [...] the real world sucks a little bit but you get through it*'. This is consistent with other research on experiential learning that suggests that overcoming challenges is appreciated by some students (Sherman and Botkydis, 2020). There is also overlap with the subtheme of affective learning; according to literature, the level of comfort students feel - a positive affective state - is seen to increase affective outcomes, such as perseverance with difficult material (Kiener, Green and Ahuna, 2014). Dealing with the unknown required perseverance from students, and this had some impact on affective learning, where students came to value challenge.

The literature review also underlined that some students appreciate more expected types of learning which provide them with certainty and explanation (Green, Hammer and Star, 2009), and this was evident in a student's comment about wanting to know '*what we have to actually do*'. Negative comments represented just a small number of the total comments in relation to this subtheme, but are important as part of the authenticity of the unknown and also with the subtheme of negative affective states. Dissatisfaction or unhappiness is consistent with literature that indicates that students may be frustrated by uncertainty that is experienced due to the nature of authentic tasks, which themselves tend to have a level

of uncertainty or messiness (Herrington, Oliver and Reeves, 2002; Fitch, 2011; Scott, Penaluna and Thompson, 2016).

While staff saw that some students '*were wanting a brief that basically tells them what to build*', they believed that engaging with the unknown was an important part of the live brief, and saw helping students to recognise this as part of their role. The fact that some students '*didn't really get it*' at the live brief's outset points to a period of instability and additional scaffolding. As per the previous subtheme, this is consistent with the extra scaffolded support needed at the outset of experiential learning (Herrington, Oliver and Reeves, 2002). In conjunction with the scaffolding subtheme, the level of academic support would seem to contradict criticisms of experiential learning that imply these might be minimally supported to the detriment of learners (Kirschner, Sweller and Clark, 2006; Clark, Kirschner and Sweller, 2012).

5.3.4 Authenticity: summary

When explicitly discussing authenticity, there was a consistently positive view of the 'realness' of the live brief because it was seen to have value in reflecting their future working. The notion of realness in itself was complex, paradoxically almost idealized as a learning experience and also seen as safer than the reality that the students would encounter in their professional lives.

As soon as students and staff moved beyond their initial discussions of the positive 'realness' of the live brief, the views were more mixed. Authenticity also involved students engaging in a novel way of learning with a number of unknown factors. While these were undoubtedly real-world challenges, unlike the uniformly positive comments on the 'realness' of the live brief, engaging with the unknown was seen to cause frustration for a small number of students.

Staff again highlighted the scaffolding needed to support students through the project, particularly in relation to helping them understand their empowered role as learners. The examples of types of scaffolding, from dealing with '*moving parts*' to preparing students for client engagement, show that there is a significant amount of different work involved in supporting learning through a live brief when compared to other types of teaching.

5.4 Learning

The overlap of the theme of learning with the other two main themes of authenticity and the affective dimension mean that it is appropriately positioned between the two: most of the learning was seen to be attributed to the authenticity of the live brief, and most of the learning comments appeared to situate learning in the affective domain. Learning is nonetheless an important theme in its own right. Subthemes in this section include learning gain, the development of soft skills and ‘capstone learning’ where students draw together previous learning as part of a project.

5.4.1 Learning gain

As noted in the introduction, the concept of learning gain remains central to the higher education sector, with its importance largely driven by the Teaching Excellence and Student Outcomes Framework (TEF), the national framework created to assess teaching quality and its impact on students’ future employment or study. Given the centrality of learning gain and metrics to the rationale for the research, a question on learning gain was included in the focus groups. Participants’ comments suggest that they recognise the complexity of learning gain as well as the limitations of grade measures.

Contextualized examples

The students’ views suggested that they understood the complexity of capturing learning in a metric. As one student noted succinctly:

[We] can’t actually properly measure it (Group F, 2016).

Many students’ comments suggested that the difficulty in capturing learning was the fact that this would vary from individual to individual, with much of the learning concealed:

You can’t mark what happened inside us. So, for example, we improved our communication skills, we improved our time managing skills, and I think you can’t check it, you can’t mark it (Group B, 2016).

And

I think it’s only one number and it’s not saying anything about what we’ve learned or what we’ve done, because we might have learned completely different stuff from someone else but have the same grade (Group A, 2016).

Grades were nonetheless viewed as very important by students. And, while the majority of students indicated that the grade would not capture learning, this view was not

uniformly held. A limited number of comments suggested that the grade would reflect an end product that could be used as an overall proxy, but this was cautiously framed:

I guess it's really based on the quality of the work at the end. That's the only way you can really assess it because without that there's not really anything to go by (Group G, 2017).

Grades were seen to show an end result, as opposed to effort:

Because the grade, it marks only the outcome. So they know what we did because we gave them [formative work], but they didn't know what we went through during the process. Like, it wasn't our diary, so we didn't write in it. So I think it's not that much relevant, because every one of us put a different skill, a different part our time, to the project, I think. So, for me, the mark will be only for the outcome, not for the whole few months, actually (Group B, 2016).

It is unsurprising, however, that grades were still a valued metric, and seen to direct students' attention to particular types of activities, or causing frustration when they did not reflect effort:

I just like getting good grades. I feel quite disheartened if you've put all this work in and then you get a bad grade. It's just a bit of a slap in the face, because you work your arse off and then you just get, like, a C (Group C, 2016)

Staff comments indicate that they were similarly aware of the difficulties in capturing learning gain through the live brief as some type of metric, as per the following comments:

How you capture [learning gain] in a way that isn't verbose, and someone can stick a number in a box or something, I've no idea (Group L, 2017).

And

Well, I think it's up for definition at the moment, isn't it, really? If it's going to be meaningful then it has to be a sense that the student has, rather than the organisation, of some form of progression amongst all sorts of dimensions and soft skills. It's not going to be easily measurable, it'll be qualitative, it'll be things like confidence (Group K, 2016).

Other comments pointed to the near impossibility of capturing everything learned as part of a graded assessment:

[We tried to capture learning in a graded result through] the written report and the screenshots, [but] they don't capture the human element. I don't have an answer to how you can necessarily capture [that], other than recording them 24 hours a day (Group L, 2017).

Staff recognised the importance of learning outcomes in relation to delivery of the live brief, and felt that the live brief had afforded opportunities for learning that went beyond those expected:

I think it met the learning outcomes. It actually exceeded it in those, sort of, dimensions of learning gain that we're trying to capture as well. For our students, I think to give them a task and a reason for undertaking certain activities, so there's a clear end point with a working context, and then to step back- because I think it was a refreshing thing to present to Bucks County Council, and Fay and her colleagues, all they were interested in, really, was the content. (Group L, 2017).

Learning gain: discussion

The participants' awareness of the limitations of metrics to capture learning gain as part of a live brief are evident in the focus group results. The comments are consistent with the findings of the evaluation of the learning gain research: in spite of extensively funded research, the conclusions on what metrics might effectively capture learning remain limited, with learning gain seen as complex and multifaceted (Howson, 2019; Robertson, Cleaver and Smart, 2019). There is some alignment of this discussion with the theme of affective learning, as per the student's observation that *'you can't mark what happened inside us'*. The invisibility of aspects of affective learning was noted in the original publication by Bloom *et al.* (1956).

Both students and staff point to the limitations of looking at just the end product, which was not seen to reflect the live brief experience nor capture the complexity of learning. This is also reflective of literature that suggests that there is a benefit in considering metrics that are broader than end results (Beghetto, 2019). A limited number of comments cautiously suggested that the grade would be a useful proxy for learning because it shows effort in an end product. The idea that some students would welcome some recognition for their diligence and efforts appears in literature (O'Donovan, 2017). Beyond schools, however, I have not come across any metrics that attempted to capture effort in higher education.

Grades were nonetheless, unsurprisingly, viewed as very important by students and seen to focus students' attention. Research is clear that grade-assessment dictates students' study activities (Higher Education Academy, 2012).

5.4.2 Development of soft skills

The development of skills emerged as a prominent subtheme of learning. Comments from both students and staff were too numerous to show the breadth of soft skills including self-management, communication and time management. However, the main area of soft skills

development is seen to foremostly relate to the development of teamwork, in which other soft skills were often embedded.

Contextualized examples

As per the theme of authenticity, the opportunity to work with others as they might in a 'real' setting was seen positively. Many students' comments suggested that learning in relation to the live brief was about teamwork, some of which embedded project management:

For me, from this project, the most important thing to learn was the teamwork (Group B, 2016).

And

[The experience was] about teamwork, about being on time, for example, or organizing stuff. I think that was fun and that was good because we could organize our time, and try to figure out a solution [...] working with the computer guys (Group E, 2016).

The opportunity to see a project through as a collaborative activity was also noted regularly by students:

To be honest, I learned a lot from the project, like developing a project from the start to the finish. [...] And of course, how [the other discipline worked] and how we all put it all together (Group J, 2017).

Some felt that they had taken on a particular role within the team, and that the live brief had given them an opportunity to develop leadership experience as well as managing the project:

I felt in the group I was more the team leader and trying to get everyone organised. Obviously, I'm not much of an outgoing team leader so for me, having this change of role I felt was quite interest[ing]- I really enjoyed the experience of having this role of leading (Group C, 2016).

Working in teams did not always suit students, however, and some students reported difficulties with individuals in their teams:

We had a bit of a problem with [Student] because about a week to two weeks before we needed to do the presentation, [they] said, "I don't know what to do on quite a big part of it." I was like, "Okay, you're not leaving me much time to do this. If you said this four weeks ago, I could have had it done for us quicker." So I had a bit of a rush with doing a lot of the work myself, but [they] didn't really do much to help (Group I, 2017).

Another student reported that they did not experience teamwork at all:

I don't know, it felt like we had two different briefs for two different classes. It didn't feel like we were connected enough. [...] there was a massive lack of interaction (Group H, 2017).

Like students, staff generally indicated that the opportunity to develop teamwork skills was a particular feature of the live brief and again one that dovetailed with project management. However, there was also recognition that some students may have experienced unwelcome difficulties:

[Most groups] really took on the management of things very clearly. One of those groups had I think a number of disputes within their team. Things were pulling in different ways, but the two people leading it managed to pull it together. They probably learnt quite a lot from that experience, although you may want them to put it a little bit further behind them to ask them whether they actually enjoyed it (Group K, 2016).

This comment shows that there is potential to continue learning through challenge. Problems within teams is certainly an authentic feature of the live brief, but not one that is always welcomed.

Development of soft skills: discussion

The development of soft skills was an important feature of the live brief for students and staff. There is consistency with these findings and other studies on experiential learning in higher education, with the development of a range of soft skills (Sherman and Botkydis, 2020), notably team work and communication (Kim, 2019; Richardson, Stenquist and Stenquist, 2019), and problem solving (Hulaikah *et al.*, 2020) are seen as positive outcomes.

The theme of soft skills also connects several subthemes. Collaborating with others was seen as an authentic feature of the live brief, viewed primarily positively by students and staff. Teamwork as a soft skill is slightly different in that this subtheme is what students and staff suggested was learned. Working with others- and particularly learning from others- is also part of the affective learning subtheme, as it appeared to be valued.

The overlap between cognitive and affective can also be seen in several comments, such as the student who suggested that they had acted '*more the team leader and trying to get everyone organised*'. Literature underlines that for many affective actions to take place, such as initiative or leadership, there must be some cognitive underpinning of knowledge, and for this reason inclusion of opportunities to take part in work-based experiences in higher education offer opportunities to bridge the cognitive and affective domains (Bandaranaike and Willison, 2015). This can be seen in the case of the student who took on a leadership role in the team, as it is likely they had some knowledge and understanding of what needed to be achieved in order to be credible.

Given the sectoral focus on the development of students as future professionals, some of which is discussed in the theme of authenticity, the results suggest that live briefs afford a particularly valuable type of experiential learning. Academics teaching in higher education focus on cognitive knowledge in part because there is less understanding of the theoretical basis for other types of learning (Shephard, 2008), and that 'soft skills' are challenging for academics to teach (Hill, Walkington and France, 2016). Live briefs would seem to afford a multitude of opportunities to support the development of graduate attributes.

Academics must be aware of the risks involved, too, however; as with several other subthemes, the experiences that live briefs provide may not always be positive or facilitate learning in the way intended. This was particularly notable in the academic's observation

that *'They probably learnt quite a lot from that experience, although you may want them to put it a little bit further behind them to ask them whether they actually enjoyed it.'*

5.4.3 Capstone learning

Capstone learning is used here to mean learning typical of capstone projects as discussed in the literature review: that is, a type of learning experience that operationalizes skills and knowledge from different sources as part of a project. A number of comments made by students and staff highlight the potential of a live brief to act as a capstone learning experience, often expressed through phrases such as *'bringing things together'*.

Contextualized examples

Students' comments frequently suggested that they believed that the live brief provided them with a unique opportunity to draw together different aspects of their learning:

It's combining different skills into one, but also it demonstrates how to create a final product... (Group I, 2017).

The nature of having a live brief was also seen by some students as a way of making sense of previously studied modules and coming to value earlier learning in terms of its applicability. The following comment shows that the student had both recognised the value of the live brief personally, and understood why academics had chosen to implement it:

You actually have to- it basically puts all the stuff like design documents and all the stuff we've learnt in the previous years and you actually have to do it. Then you get an appreciation for this is probably why they're doing it (Group F, 2016).

Staff similarly viewed the live brief projects as drawing together a range of skills and knowledge in a way that pushed the boundaries of students' prior learning:

That's what they're going to meet in the real world, you know, digital and graphic design concepts where it is the future of the industry with virtual reality and everything (Group L, 2017).

One staff member saw the application of a range of knowledge to the live brief as important and enhanced through feedback.

...that's really important. That is the most important thing really. When you go to university it can be a little bit of a bubble. You're learning different stuff, but you've got to get out in the real world and apply what you've learnt. If you can start that application while you're still at university I think that's really valuable. If you can get feedback on how you've done, then that's even better (Group K, 2016).

Capstone learning: discussion

Live briefs afford opportunities to draw together a range of learning and skills. The students' and staff comments suggest that they believed that the live brief brought together different types of learning. To some extent, the live briefs enable students to make sense of prior learning, as per one student's comment that *'you get an appreciation for this is probably why they're doing it'*. Coupled with the reported soft skills development, the opportunity to engage holistically with capstone learning seems particularly valuable.

This is consistent with the implementation of capstone projects, seen to foster ongoing development and deep learning (Milner, 2017). As a type of culminating experience that is considered significant in its ability to prepare students for employment, capstone-type projects are underutilized in the UK given their affordances (Healey *et al.*, 2013). As per the remarks of staff in the focus groups, live briefs both enable the holistic learning experience itself, but also provide the opportunity for students to gain feedback.

5.4.4 Learning: summary

The theme of learning encompassed the subthemes of learning gain, soft skills and capstone learning, and as discussed many of these overlapped with other subthemes from the focus groups. Capturing or measuring learning gain that developed through engagement with the live briefs was acknowledged by students and staff alike as being complex. Both groups recognised the qualitative and hidden nature of much of the learning that they felt had occurred. The development of teamwork and associated soft skills were seen as important areas of learning that resulted from cross-disciplinary working on the live brief. As 'graduateness', or employment readiness, is seen as an important part of students' development while at university, the results suggest that live briefs may support particularly rich learning experiences. It is important to note that the results suggest that not all students are seen to benefit equally, and as per other subthemes, live briefs do not guarantee all students will have consistently positive or developmental experiences. Students and staff did recognise, however, the opportunity of capstone learning facilitated by the live brief experience. A number of comments related to the affordances of the live brief in facilitating an experience where students could draw together different types of learning and previous learning as part of a whole.

5.5 Affective dimension

The theme of the affective dimension includes the subthemes of both perceived affective learning and affective states. As per the literature review, affective learning has two elements: what is typically thought of as the learning or change in attitude, emotions or values, and the affective state, or predisposition and attitude to learning itself (Neuman Allen and Friedman, 2010). The frequency with which students and staff referred to aspects of the affective dimension was notable, especially in light of overlaps with the other main themes.

5.5.1 Affective learning

An examination of comments suggests that students were engaged at a variety of different levels within the affective domain as it is defined in the original taxonomy (Bloom, Krathwohl and Masia, 1964) and set out in the literature review, with many at the highest level of *internalizing values*.

The subtheme of affective learning includes both positive examples as well as highlighting a small number of comments that show a lack of affective learning. For this reason, there are two sets of contextualized examples.

Contextualized examples for affective learning:

Examples show students' perceptions of affective learning from a sample of different levels as defined by Bloom *et al.* (1964): receiving phenomena, valuing and internalizing values.

Receiving phenomena involves preparedness to listen to others. Students' motivation for listening to others varied. In the first example, the student reports listening to others as a means to potentially improve their grade:

[The academics had] split us with the different course, with the creative students and they were giving us information for our app that we were making. So we were interacting with them. It helps us to get our work done as well and if you need to change any stuff we've got them to see and give us advice on what we need to do (Group E, 2016).

Valuing can take different forms, seen to include learners' belief in a process, or show initiative in planning positive change. This example shows the student's belief in the live brief process as a vehicle for their learning:

[This module] had the steepest learning curve but it actually felt at the end it was definitely

the most rewarding of the courses we've been on. You feel like you've progressed (Group H, 2017).

Internalizing, the most advanced level of the affective domain, is where learners have internalized values and act accordingly. Every group but one made comments that indicated that they had internalized some value in different areas in relation to the live brief activity. One typical example shows a creative student showing that they had enjoyed learning about another discipline's practice, showing that they had internalized the value of cross-disciplinary teamwork:

[Doing the live brief with another discipline] allowed us to actually learn a little bit more about the computer side. I'm not very techy [...] you had to know the correct hex code to do the colouring [...] I thought you could just play around with the slider, like you get to in Photoshop and stuff. That, I thought, was really, pretty cool (Group A, 2016).

Internalizing was also seen in the way that learning was valued, often referred to as 'interesting'.

...obviously working with a bigger group of people when you've got to rely on design to get the part through to you so you can start implementing what they've done into the actual website, I found was interesting, really (Group J, 2017).

From the staff perspective, affective learning was seen as a desirable outcome in relation to cross-disciplinary working:

You know, working with different personalities, teams, not just different personalities within the same course, but from a completely different course, I think was valuable. It gives them a heads-up for life, I think (Group L, 2017).

Staff comments regularly referred to the opportunity and desired affective outcome for students to value their contribution to the community through the development of the live brief, but this was not picked up in the students' comments. A typical staff comment is as follows:

I think to see it making a difference, to see what they were doing, making a difference to people as a community, I think was very helpful (Group K, 2017).

Contextualized examples: lack of affective learning

A minor theme within affective learning is the lack of affective learning- that is, the perceived lack of valuing or value development. A lack of affective learning is not a phrase used in literature, but here it is deployed to highlight that the live brief did not consistently develop students' affective learning in expected ways.

For example, one student reflected on the lack of engagement with group meetings:

...because the Wednesday meeting wasn't compulsory, a lot of people just didn't show up (Group H, 2017).

Another student reflected that their peer had engaged very little throughout the process:

I asked [Student] to make the logos and then send me the logos and I could design the website around them. [They] didn't send me the logos until 2:00am of the day of the submission, and I'd been chasing [them] for weeks and weeks and weeks (Group D, 2016).

At a later point in the focus group, when asked what they felt they had learned, the same student gave the following reply:

Group D: Not to rely on people (Group D, 2016).

One staff member recalled that one of the activities organized for the groups of students was a local walk with the client. This example was used in an earlier subtheme as part of the scaffolding work that had been implemented to support students' engagement with the client. However, very few students participated in the way that had been intended:

I do remember we went to great lengths to prepare them for the [walk with the client]. We asked them to prepare questions, to pose questions as well and we followed up after the field trip. There was very little response (Group K, 2016).

Affective learning: discussion

As per the literature review and the analysis of the module learning outcomes, affective learning is both valued and underdeveloped in higher education.

The focus group transcript analysis highlights a significant number of comments that evidence affective learning. As well as the examples of reported affective learning in this subtheme, visible examples of internalizing might include participating actively and positively in teamwork, and this was evident in the subtheme of soft skills. Students' contributions indicate that much of the affective learning was at the higher end of the

domain of having internalized values, and that they had genuine interest in, for example, learning with and from others. Increased student interest has been attributed to experiential learning in other research (Sebby and Brown, 2020) and this suggests that experiences such as the live brief may encourage affective learning.

Literature suggests that working with the local community can strengthen links (Sebby and Brown, 2020) and that the real world relevance of working with industry or government is viewed positively by students and seen to motivate them (Jiji, Schonfeld and Smith, 2015). However, the results suggest that engaging with the local community was of considerably less importance to students than it was to staff.

The development of values, from seeing value in learning from others or opportunities for self-development including leadership may seem unambiguously positive. As per the literature review, however, there is some indication that the intentional development of values can be seen as problematic (Shephard, 2007). Academics are seen to view the development of affective values positively (Bowman and Akcaoglu, 2014) as seen in their impression of students' valuing their contribution to the community through the live brief. The misalignment of values of students and staff has been highlighted in literature, which proposes all teaching of values should be explicit. This perhaps is a way both of promoting the value as well as ensuring a shared understanding, even when its intention is well-meaning (Killick, 2016; Hinchcliffe, 2020).

Many, but not all, participants' comments suggest that there was genuine and meaningful valuing of the learning afforded by the live brief projects. Having acknowledged this, it is evident that some students involved in the live briefs did not share or develop the same values. This was evident in several comments where students reported that '*a lot of people just didn't show up*' to some non-compulsory meetings, or the academic's observation that students had shown '*very little response*' to organized preparatory activities with the client. This underlines that, while live briefs afford opportunities to develop values, they do not guarantee that those values are developed. It also highlights the risk that is involved when working with external organizations and students do not perform to expectation (Fitch, 2011).

5.5.2 Affective states

Affective states are important as they can impact on learning. A student's affective state may be positive as seen through interest and willingness to learn, or negative, where they may feel frustrated or vulnerable (Smith *et al.*, 2013; Grawemeyer *et al.*, 2017). An affective state may be demonstrated in relation to learning itself, the teacher and the materials or content.

Contextualized examples

For the most part, students indicated that they were in a positive affective state, and this is primarily seen in their curiosity and expressions of enjoyment of learning, with some of these types of comments referred to in other subthemes. Students also demonstrated a positive affective state in relation to teaching academics, as demonstrated by their willingness to seek help because of perceived expertise:

...a specialist here such as [academic] who you could go to with an issue, such as how do you get the phone app working (Group F, 2016).

Positive references to the technologies used and experience as a whole also illustrate the positive affective state of most students, as seen in the example:

I liked working as a team, because we used this thing called Asana, and we learned time management and we had projects to do in a certain amount of time as well, which was quite good (Group G, 2017).

A limited number of comments suggested that some students experienced a negative affective state:

Group H: [The experience was] good in the way that it was quite eye-opening. Then, also because of my group, it wasn't very good because they didn't really want to work. For me, that brought the whole learning experience of the module down (Group A, 2016).

Like students, staff most often noted students' receptiveness to learning, often seen through the internalization of values in affective learning. Students' affective state is seen in their willingness to be involved, and there is some relationship with the level of interest in aspects of the project. This is seen in the academic's comment which points to mixed affective states, both curiosity and a lack of curiosity depending on the personal interests of the students:

Some benefited from doing some historical research. Some found that particularly interesting, and again, that was fairly varied. Some didn't find it interesting (Group K, 2016).

Affective states: discussion

Literature highlights that emotion already features as part of the learning experience but remains largely hidden (Beard, Clegg and Smith, 2007), and the focus group analysis brings to the surface differences in the students' feelings about the live brief project.

Given the breadth of its definition as the 'attitude, confidence, enjoyment, enthusiasm for a topic, feeling comfortable with complex ideas, interest in a topic, motivation, satisfaction and self-efficacy' (Rogaten *et al.*, 2018, p. 5), elements of affective states seem to appear in almost every subtheme. Several of the other subthemes, for example are also suggestive of a positive affective state through their openness to different elements of learning through the live brief projects, such as cross-disciplinary working or taking on different responsibilities within a team. The relevance of the affective state is its impact on achievement and success, where students are either motivated (or demotivated) in their engagement because of their affective state (Smith *et al.*, 2013; Grawemeyer *et al.*, 2017). In the examples in this subtheme, students primarily expressed a positive affective state in relation to both the academics on the programme and the materials.

Negative affective states can result in students not progressing or engaging with the process of learning. Literature indicates the importance of an environment where students feel valued, listened to and respected, acting as a safe space to support learning (Kisfalvi and Oliver, 2015), and a few of the comments suggest that some students did not feel listened to or valued by peers. While a minor feature of the analysis, this was evident both through students' observations of their peers, but also in cases where students felt let down by their team.

5.5.3 Affective dimension: summary

Affective learning and the different affective states reported by students and staff were brought to light through the focus groups, which afforded students with the opportunity to reflect on their experience as part of a live brief project. Both Dewey (1938) and Kolb (1984) highlight the role of reflection in experiential learning. Reflection is seen as enabling insight into the process of learning (Wilson, Howitt and Higgins, 2016).

The theme of the affective dimension was perhaps the most challenging to frame within the results. This is both because of its overlap with other subthemes, often noted in discussion,

and the difficulty in identifying it. Students and staff reported emotions and expressions of valuing represent only the visible layer of affective learning. Prior to verbalizing anything, there will have been what Brett *et al.* (2003) refer to as the other subcomponents, where they first felt an emotion and then recognised it. What was said, then, is quite literally a top layer of emotion that students decided (or not) to express during the focus group or staff's reported observations of the students' engagement with aspects of the live brief.

Given their authentic nature, live briefs seem to facilitate affective learning opportunities for students who are learning to become part of a profession, and this may have a long term impact on retention (Salzmann, Berweger and Ark, 2018). Affective learning was a marked feature of the live briefs: students' contributions suggest that they had experienced learning at the top of the affective domain, having internalized values in relation to, for example, cross-disciplinary working or challenge. Some students, however, did not model or report expected affective learning, demonstrating that while live briefs afford a number of opportunities for students to develop values and attitudes, they do not consistently support all students' development.

It is important to note that affective learning is viewed retrospectively by students and staff; there was no 'hidden curriculum' to be developed. However, staff comments suggest that there was an anticipated opportunity for students to recognise or internalize the value of supporting the local community. This appeared less important to students.

A number of comments, some of which were reported in other subthemes, referenced the positive affective state that students experienced when undertaking the live brief. This was apparent in their interest and curiosity in a range of aspects of the live brief, such as the opportunities to learn from others, or to draw together different types of learning. They demonstrated, too, a positive affective state in relation to staff and materials. However, the frustrations experienced by students and observed by staff, notably in relation to the challenge of the unknown and working relationships with other students, suggested that some students experienced a negative affective state.

5.6 Results: final discussion

While a discrete discussion of the results of the analysis of module learning outcomes and focus groups facilitated a more detailed, and therefore insightful, view of the data, the final

discussion provides an opportunity to have a contextualized discussion of both sets of data and a further return to wider reading from the literature review. The results of the focus group analysis suggest several key themes in relation to participants' perceptions of experiential learning based on their involvement with a live brief project. The significance of the themes of authenticity, learning and the affective dimension in relation to literature and sectoral priorities are more apparent when these are considered in conjunction with the analysis of the validated learning outcomes for the modules that underpinned the live brief projects.

The beginning of the thesis defined learning outcomes as 'what a learner is expected to know, understand and/or be able to demonstrate after completing a process of learning' (QAA, 2018). Given that the validated outcomes represent what a university has committed to providing, it seems appropriate to begin the final discussion by considering the results from the analysis of the learning outcomes for the modules that underpinned the live brief projects. Putting to one side issues of quality of learning outcomes, two results from the analysis of the learning outcomes are particularly salient to the consideration of the results of the focus groups, particularly when considered in a broader context: the potential influence of using *Anderson et al.'s* (2001) revised taxonomy in the design of learning outcomes and the lack of affective learning outcomes.

When *Anderson et al.* (2001) revised the *Taxonomy of Educational Objectives* of *Bloom et al.* (1956), the revision was of the original *Handbook 1*, on the cognitive domain. In a section aptly titled *Unsolved problems* (*Anderson et al.*, 2001, p. 257), the authors of the revised taxonomy suggest that separating the domains had received just criticism in the original publication. They argue that 'nearly every cognitive objective has an affective component' (*Anderson et al.*, 2001, p. 258). Education theory and education research consistently acknowledge the role of emotion in learning (*Dewey*, 1938; *Kolb*, 1984; *Brett et al.*, 2003; *Dreyfus*, 2004; *Grawemeyer et al.*, 2017). A neuroscientific perspective complements this view. *Immordino-Yang and Faeth* (2010) suggest that both the conscious and nonconscious emotions play an important role in guiding what educationalists would refer to as learning, that is, a demonstrable achievement of an outcome. Moreover, they suggest that without emotion, learning is impaired (*Immordino-Yang, Yang and Damasio*, 2016).

The complexities of the relationship between cognitive and affective, whether theoretical or neuroscientific, are, however, somewhat lost in application. As is intended, the revised taxonomy is used as a planning tool by academics (Anderson *et al.*, 2001). Academics rely on the verbs, or variations of verbs set out in the cognitive process dimension. As the name suggests, the verbs in the cognitive process dimension are associated with the cognitive, or knowledge, dimension.

The use of 'Bloom's' to develop learning outcomes dominates higher education (Newton, Da Silva and Peters, 2020). The learning outcomes for those modules analysed were almost certainly developed using the verbs from the cognitive process domain. It is perhaps unsurprising, then, that when reapplying the revised taxonomy to analyse the module learning outcomes, virtually every learning outcome appears to be a cognitive learning outcome. I chose to code the learning outcomes against a second taxonomy, Atkinson's (2013) Circles, not to suggest that it is superior, but because it affords a different lens with which to view learning outcomes. The results of the juxtaposition underline the revised taxonomy focusses on the cognitive domain. And, while this is to some extent self-evident, there was still value in carrying out the mapping activity to confirm this. In their publication of the revised taxonomy, the authors themselves point to the significant number of other available taxonomies (Anderson *et al.*, 2001). The dominance of Anderson *et al.*'s revised taxonomy (2001), when viewed in the context of other available models suggest that these merit further examination (Suto *et al.*, 2020).

Anderson *et al.*'s (2001, p. 258) pertinent observation that 'every cognitive objective has an affective component' is supported by the inclusion of the metacognitive knowledge category in the two dimensional framework. However, the two-dimensional framework's use is limited, meaning that the visibility of the affective domain is a significant issue when developing learning outcomes. In the UK, outcome-based approaches to planning and designing learning, where learning activity is planned to enable students to meet defined learning outcomes is central to practice (Newton, Da Silva and Peters, 2020; Cleaver and Mclinden, 2021). If the starting point of learning design is a cognitive learning outcome, then the chosen approach to learning and teaching is likely to favour the development of cognitive knowledge. Indeed, it is suggested that outcomes-based systems on which the revised taxonomy is deployed are poorly equipped to support affective learning (Hyland,

2011). Whether there is an intention to complement cognitive outcomes with affective learning is not disputed. The systems, however, are based on transparency, and an alignment between learning outcomes, teaching approaches and assessment. If affective learning is not named, it may not be included, and for this reason outcomes-based approaches risk encouraging an instrumentalist approach to teaching (Torrance, 2007).

The results from the analysis of learning outcomes is in significant contrast to the results that emerged from the focus group discussions. While the learning outcomes were seen to involve the development of cognitive knowledge, this was not a feature of the focus group results. Rather, the focus group analysis suggested that, for both students and staff, the broader developmental opportunities that the authenticity of the experience afforded in terms of soft skills development and affective learning were more meaningful.

Authentic learning experiences are viewed primarily positively in literature, but in practice the results of the focus groups underlined their complexity. An earlier comment highlighted that transparency risks supporting an instrumentalist approach to learning and teaching (Torrance, 2007). Approaches to teaching that are less defined also carry risk and experiential learning necessarily involves factors that cannot be controlled (Fitch, 2011; Scott, Penaluna and Thompson, 2016). The results indicate that not all students will be satisfied with the outcomes. Dealing with challenge, popularly referred to as 'resilience' is important in professional life. The focus groups and literature both suggest that overcoming challenge can be viewed as a significantly positive feature of learning activities (Sherman and Botkydis, 2020).

Academics, however, may be understandably reticent to introduce experiences where even a limited number of students might feel overwhelmed or frustrated. Literature suggests the importance of providing a safe space for students in experiential learning (Kisfalvi and Oliver, 2015). Ensuring students' wellbeing is paramount, but remaining cognizant of satisfaction is also important in a context where metrics such as the National Student Survey carry such significant weight.

Broader developmental opportunities, such as the learning of soft skills are similarly absent from learning outcomes. Experiential learning also recognises that learning can include both intended learning outcomes as well as those that are not anticipated (Beard and Wilson, 2002), and this has implications for what learning can be reflected in a grade outcome. This

is more broadly acknowledged in literature in that, while authentic experiences offer meaningful learning and development, capturing this through existing systems is challenging (Serrano *et al.*, 2018). Students and staff reported the development of soft skills including teamwork. Many of the reported soft skills developed overlap with what are referred to as graduate attributes, those 'distinctive qualities, skills and understandings' that students will have on graduation (Fry, Ketteridge and Marshall, 2015, p. 433). The difficulty is in embedding soft skills within the curriculum and its delivery (Hill, Walkington and France, 2016) and again, capturing their achievement. Most students did not believe that grades would reflect their learning to a significant extent, and staff viewed most of the learning that had occurred as 'qualitative'. This was not to say that grades were seen as unimportant; as students particularly commented, these have a place and value. It does, however, point to the limited nature of grades if they are only seen to capture the assessment of the learning outcomes.

The affective dimension was a final major theme in the focus groups, and more significant in the light of the virtual absence of affective learning outcomes. As established, affective learning relates broadly to feelings and attitudes, and was seen as a component of all learning. Kolb (1984, p. 31), who popularized experiential learning through his experiential learning cycle, saw this type of learning as part of the whole: '[learning] involves the integrated functioning of the total organism- thinking, feeling, perceiving and behaving'. In this way, all the feelings and perceptions both positive and negative are important.

Academics themselves both value and may seek to integrate opportunities for affective learning (Bowman and Akcaoglu, 2014). Even if one is willing to accept the absence of capturing the development of affective learning in the light of cognitive learning outcomes, there is still significant challenge in designing in affective learning or assessing it. Academics may feel poorly equipped to design, teach or assess affective learning (Neuman Allen and Friedman, 2010; Buissink-Smith, Mann and Shephard, 2011; Huxley-Binns, 2015). Carefully implemented, experiential learning presents a useful approach for academics to support students' development of affective knowledge. Experiential learning types such as live briefs can facilitate the development of high levels of affective learning, seen to require 'real world' experience (Ilonen and Heinonen, 2018).

The examination of participants' perceptions as part of an experiential project in higher education using a live brief suggests that the main themes of authenticity, learning and the affective dimension were valued components of the learning experience. It was a virtual impossibility to engage with all of the more minor themes that either could not or did not emerge from analysis: notably, for reasons of their very nature, tacit knowledge and abductive reasoning remained largely invisible.

Considered in conjunction with the analysis of the validated learning outcomes for the modules, the main themes from the focus group reflect a number of concepts well documented in literature. Results point perhaps most visibly to the disparity between intended and perceived learning in the context of systems which prioritise cognitive knowledge.

5.7 Limitations

The limitations of the research relate to issues of insider research, the self-selection of participants and the challenge of expressing 'learning'. Some of these issues are noted in other parts of the thesis, including the area of reflexive analysis.

While I had no responsibilities (teaching or otherwise) in relation to the students involved in the live brief projects, my role as an insider will have had an impact on the responses of both students and staff involved in the focus groups. Students, particularly, may have been guarded in their contributions. As acknowledged in the methodology, students involved in research in where staff are researchers may be reluctant to express negative views or dissatisfaction with approaches (Ferguson, Myrick and Yonge, 2006b) or want to show their teaching in a positive light (Hoareau Mcgrath *et al.*, 2015).

It is not possible to completely mitigate against issues of insider research and the related issue of power where an academic is involved in research activity with students. I have instead attempted to address issues of power both through transparency in relation to my role as an insider researcher and actions throughout the thesis, and the way that I engaged with students during research. For example, as per the method, I started each focus group with introductions. When introducing myself, I made my role as a researcher clear. I reminded students that the research was in no way related to their assignment, their marks or their participation in the live brief.

As per the process outlined, focus groups were audio recorded. Part of my approach to collecting the data as an insider researcher was to minimize my 'researcher' role and conduct the focus groups in such a way that they complemented the live brief by affording participants the opportunity to reflect. However, as per Section 4.6.7, data was anonymized upon transcription, in that individual speakers' identities were removed and groups were assigned a generic identity. This means that, in analysing the data, it was possible to see a distribution of comments across the different focus groups but not discretely within each group. As discussed, when facilitating the focus groups, I worked to ensure an inclusive approach. However, not being able to definitively determine individual speakers means that it is possible that a group who had a particularly talkative individual has contributed disproportionately in a way that did not reflect the overall feelings of group.

The self-selection of the participants is another limitation of the study. Representativeness amongst participants is important in any research because there is the potential both to exclude as well as have certain participants (and so, views) overly represented (Silverman, 2010). The data will have been influenced both by the participation, or non-participation, of students in the focus groups, and their willingness to provide honest answers. As per the method, almost all academics participated, but slightly less than half of the students did. There is no way of knowing why those who did not participate were absent; it might have been because they were unhappy with the live brief as a whole or conversely, felt satisfied with the project and felt there was nothing particular to say about it. In order not to provide skewed results, the treatment of academic views has been reported separately from those of students, but the results of the research must be holistically considered in light of participation rates.

Finally, the challenge of capturing 'learning' through any means presents a limitation- indeed, it is part of the rationale for the research. It is possible, for example, that students have developed tacit knowledge that they cannot articulate, meaning that some deeper forms of learning have not appeared in the results. In terms of the focus groups, however, there may have been an issue of shared language. The notion of a shared language is essential in any context (Thomas and McDonagh, 2013) but it is well documented that students and staff do not share the same academic language. This is particularly noted when talking about feedback (Carless and Winstone, 2020) but more broadly it is true that

students are much less likely to use the 'academic speak' of learning outcomes. Students are very likely to have referred to their live brief experiences in terms that they are familiar with, such as referring to their interactions with others, and this may make the disparity between reported perceptions and learning outcomes more pronounced.

6 Conclusion

6.1 Overview and context of findings

This research examined the perceptions of students and staff who had taken part in an experiential project in higher education. As key stakeholders, students and staff indicated that they valued authentic learning within a supported environment that live briefs provided. Associated challenges were seen as positive for many learners, but as frustrating for others. Reported learning and development was significant, involving the development of soft skills and students' contributions demonstrated considerable affective learning. The perceptions highlight disparity with the primarily cognitive intended learning outcomes. Accordingly, stakeholders viewed a final grade outcome as valuable but as somewhat disconnected to their experience of the live brief. The breadth of the disparity between reported and intended learning in the research draws attention to literature that suggests a systemic preference for the development and assessment of cognitive learning.

These results have been considered in detail and contextualized in relation to literature in the results and discussion section. The conclusion, then, affords an opportunity to consider the unique contribution of the research, and to position the research findings in a wider professional context.

The unique contribution of the thesis is the juxtaposition of the perceptions of students and staff who have taken part in an experiential learning experience with intended learning outcomes. In doing so, the research has highlighted the shortcomings of traditionally formed learning outcomes in capturing learning that fits contemporary expectations of students' development through higher education study. Furthermore, the comprehensive consideration of core theory facilitated through the literature review, namely Bloom's Taxonomy as it is understood through the work of Anderson *et al.* (2001) as a model to plan and design learning is shown to limit opportunities for learning that extend beyond the cognitive domain. This provides foundational information for the work of other researchers who have observed shortcomings of Anderson *et al.*'s (2001) framework, but not its origins.

The meaningfulness of this contribution is evident when the findings are situated within the wider professional context. A consideration of the professional context that looks beyond the discipline itself is appropriate to a thesis for a professional doctorate, as these are defined by the development of knowledge that is professionally relevant to the setting and

practitioner (Smith, 2009). As established in the methodology, this is not envisioned as a piece of research with generalizable results. The results do, however, provide a catalyst for discussion in areas of professional importance because a number of these broadly reflect practices, opportunities and concerns across the higher education sector as evidenced in literature. The main conclusions that can be taken from the research as a whole relate to themes of misalignment and opportunity. I consider each of these in turn in turn, drawing in the results of the live brief and returning to some of the context of the introduction. I conclude with a brief reflection on the impact of the research on my own development as a practitioner in higher education.

6.2 Misalignment

Misalignment is an apt, if clumsy, term to capture the mismatch between the expected impact of higher education and the way in which existing systems support the design of learning and teaching. Dewey's (1938, p. 48) observation on collateral learning underlines that intended and actual learning may never fully align; to return to his statement included the outset of the thesis: the idea that learners will only learn the concept being studied the 'greatest of all pedagogical fallacies'. The results of the live brief research are consistent with this statement, which is further confirmed by wider research on experiential learning and the hidden curriculum. While exceeding learning outcomes seems outwardly positive, a fundamental misalignment merits further consideration. There are two key reasons why a significant disparity between actual or reported learning and systems that prioritize cognitive learning outcomes should be of concern to practitioners: higher education's reliance on metrics and the ethics of a hidden curriculum.

6.2.1 Metrics and the perpetuation of a misaligned curriculum

Universities are extensions of the societies in which they operate and 'the current environment is one of quantification, standardization, and competition for resources' (Behrend and Landers, 2017, p. 603). While their use may drive positive change, the growth in metrics has also highlighted the issue of misalignment of the expected impact of higher education and the way in which existing systems support the design of learning and teaching.

As per the introduction, the TEF has acted as a significant catalyst to look more closely at the use of metrics to measure learning gain across the higher education sector. The

significant effort and funds invested into learning gain have highlighted the sector's dependence on metrics. The results of the examination concluded that 'learning gain' should include learning beyond the cognitive domain (Howson, 2019).

The existing systems, however, are designed to favour the development and measurement of cognitive knowledge. Historically, universities were places of knowledge development and dissemination (Hooker, 1997). Practices that have emerged to plan and design learning fit well with this purpose. The revised taxonomy (Anderson *et al.*, 2001), fundamentally a cognitive taxonomy in its implementation, remains central to the way that learning outcomes are currently developed in higher education (Newton, Da Silva and Peters, 2020). Under QAA (2018) guidance, universities use outcome-based learning to support consistent standards and effective design of delivery (Newton, Da Silva and Peters, 2020; Cleaver and Mclinden, 2021). If teaching activities and assessment are then constructively aligned to a cognitive learning outcome according to Bigg's (2003a) popular theory, then this is where students will focus their efforts because, understandably, 'assessment drives student effort, learning and achievement' (Higher Education Academy, 2012, p. 8). This means that the development and measurement of cognitive knowledge is prioritized. It is clear that at the time Bloom's (1956) original taxonomy was created, it suited the purpose of higher education as places where knowledge of knowledge creation and dissemination. With the additional expectation now for universities as places of social change and preparation for employment, its deployment was seen to require some scaffolding. The sector and universities themselves have tried to encourage the visibility of their commitment to the holistic development of students as is evidenced through the emergence of the Higher Education Achievement Record (HEAR) and rise in the use of graduate attributes across the sector discussed in the introduction.

While academics may value teaching of the affective domain (Bowman and Akcaoglu, 2014) or the development of graduate attributes, this does not consistently translate to reported practice (de la Harpe and David, 2012). For other academics, there may be some concern about moving away from more traditional approaches to delivery (Huxley-Binns, 2015; Bell and Liu, 2019). To some extent, there is little incentive for practitioners themselves to make changes to the way that they design learning.

Students' development as future professionals goes beyond the development of cognitive knowledge. Learning is 'not just an accumulation of skills and information, but a process of becoming – to become a certain person or, in a vocational context, a practitioner whose knowledge, skills and values are shared with others in the same field' (Hanley *et al.*, 2018, p. 25). In the UK, however, systems of designing and planning learning do not naturally facilitate this type of development. Existing metrics are, furthermore, ill-equipped to capture it (Rogaten *et al.*, 2018). Metrics have not in themselves caused the problem. It is their importance in higher education and limitations in measuring other areas of learning beyond cognitive development that can be seen to perpetuate a misalignment between the expected impact of higher education and the way in which existing systems support the design of learning and teaching.

6.2.2 Ethics of a hidden curriculum

The misalignment between intended learning outcomes and broader expectations of student development points to a second concern for universities and practitioners, which are the ethics of a hidden curriculum. As noted in the literature review, a hidden curriculum refers to implied behaviours, values or norms (Alsubaie, 2015), and it is attributed to Dewey's notion of collateral learning (Czajkowski and King, 1975; Portelli, 1993; Killick, 2016; Blasco, 2020).

Unlike learning outcomes, when well written, the hidden curriculum does not provide students with a shared understanding of expectations of learning. While graduate attributes may provide an indication of expected development, order to be effective, it is suggested that these must be mapped into the curriculum (Bridgstock, 2009). At my own institution, learning outcomes are 'mapped' to graduate attributes within all new programme specifications and module descriptors, documents that are accessible to students, but not often accessed in practice. However, the mapping is not visible within documentation that students would access as part of their normal activities, such as the assignment brief, grading descriptors or module scheme, meaning that they once again become 'hidden' to students.

Some degree programmes, including degree apprenticeships, embed the teaching of values or soft skills explicitly within learning outcomes, meaning that these are visible. Having these same values or communicated via graduate attributes or expectation is problematic.

The ethical complexities are related to visibility and, relatedly, any expectation of assessment.

It is suggested that expected development, particularly in the area of values, should be explicit and open to discussion (Killick, 2016; Hinchcliffe, 2020). It would seem inarguable that the development of professional values or skills may provide long-term benefits, particularly in the light of literature suggesting a relationship between the development of student's affective commitment and a long term impact on retention (Salzmann, Berweger and Ark, 2018). In addition to the importance of establishing shared values, there is the importance of students' voice in what they might prefer to dedicate their time to developing. In cases where these are not embedded into the curriculum in a way that contributes to the students' grade outcomes, students may legitimately feel that their efforts are best applied in other ways.

6.3 Opportunity

Given that learning is assessed in conjunction with defined learning outcomes, the absence of affective learning outcomes indicates that this area, and potentially a range of other types of learning, may be overlooked. If the starting point remains linked to a fundamentally cognitive taxonomy, then it is unlikely that there will be substantial change to the design of learning outcomes and the resulting alignment with teaching and assessment as part of the design process. Change, however, is difficult to implement on a significant scale: 'As many across the sector will testify, the complete redesign of pedagogies and curricula across a whole institution is a mammoth undertaking and, to be successful, requires strategic direction and support as well as agility in its implementation (Cleaver *et al.*, 2017, p. 158).

As tempting as it is to suggest sweeping institutional or even sectoral change, I have drawn on the results and wider literature within the thesis to frame the opportunity section in relation to academic practice, as would be appropriate to a professional doctorate. Moreover, academics are empowered to drive positive change in a number of ways.

Academics have opportunities to contribute to the narrative on metrics and the way that they are applied to their own teaching. There are practical ways that academics can engage with theory more effectively in the planning and design of learning. There are also

opportunities to continue to develop and align educational research with cognitive psychology and neuroscience.

6.3.1 Metrics: contributing to the narrative

The rising importance of metrics and developing nature of their type and use presents an opportunity for academics to become involved in the narrative.

Acknowledging the imperfect nature of metrics is the starting point. Metrics in higher education are used in a way that is overly simplistic (Kukla-Acevedo, Streams and Toma, 2012). In spite of claims made otherwise, currently used proxies across the sector both nationally and internationally for measurement do not directly measure learning (Australian Learning and Teaching Council, 2008).

Their increased importance in higher education have turned metrics into a type of wicked problem. Wicked problems are characterized by complex social elements which prevent them from being easily defined and thus solved (Mette *et al.*, 2017). As their name would suggest, wicked problems resist being addressed by a single approach (Ritchey, 2013; Deeley *et al.*, 2019) and may never truly be solved (Behrend and Landers, 2017). The difficulty of applying metrics to capture learning and teaching in higher education is such a wicked problem: there is no perfect answer to their use (Robertson, Cleaver and Smart, 2019). Moreover, 'the search for increasingly robust indicators is a fool's errand, and instead we should be focusing on a collection of those indicators that are "good enough"' (Stuart, 2015, p. 265).

Extensive research on learning gain, as previously discussed, has confirmed an absence of definitive metrics. In this space, there are opportunities for academics to consider ways of developing their own. Existing metrics will continue to be used, but there are toolkits to facilitate discussions of 'intangible assets' to assist academics in framing elements that may not be visible in currently used metrics (Robertson, Cleaver and Smart, 2019). Academics may further consider involving students in the development of measures of learning gain, which would be both appropriate to the ethos of partnership supported by the QAA (QAA, 2012) and ensure that metrics hold meaning to key stakeholders in the learning experience.

Moreover, 'arguing against accountability or transparency seems anti-progressive' (Spence, 2019, p. 767), and to some extent, it is just that. The educated use of metrics can inform

positive change that benefits students, staff and institutions. The introduction noted that many academics feel carried by change (Hotho, 2008). Accountability and metrics are a recognised feature of higher education. In contributing to the narrative, academics can inform change and play a more important role in how these are used in their own practice.

6.3.2 Enhancing the use of theory to improve the design of learning

The way that key theories are taught and applied in higher education is within the control of academics. Encouraging a deeper understanding and application of theory may have a considerable positive impact on learning, teaching and inclusivity. This is perhaps most clearly seen in the teaching and application of Anderson *et al.*'s revised taxonomy (2001) and Bigg's constructive alignment (2003a).

I have, myself, been tasked with teaching Anderson's revised taxonomy, and so it is with some embarrassment that I reflect that I have myself perpetuated a focus on the cognitive domain and on a single taxonomy. Handbooks for learning and teaching in higher education suggested to me that domains of learning would only refer to 'Bloom's' (e.g. Fry, Ketteridge and Marshall, 2015). While I have signposted the SOLO Taxonomy (Biggs and Collis, 1982) as a somewhat distant alternative, I have never situated the revised taxonomy as one alternative among many. There is, however, a significant opportunity to encourage more breadth of learning through the teaching of taxonomies.

This is not to suggest that, as part of accredited programmes, new academics should be expected to engage with multiple taxonomies. In more thoroughly considering Anderson's revised taxonomy and situating it as one of multiple taxonomies, it would enable practitioners to more broadly consider affective or psychomotor domains as accessible and assessable. In practice, new academics might be encouraged to explore the criticisms of the revised taxonomy, such as the claim that, having emerged from behaviourism, it is 'incompatible with the aims of affective education' (Hyland, 2011, p. 95) in conjunction with Anderson *et al.*'s own acknowledgement of 'unsolved problems'. Academics might be encouraged to more actively engage with the knowledge dimension and the affordances of the metacognitive category. Moreover, by positioning the revised taxonomy as one of many (Anderson *et al.*, 2001; Suto *et al.*, 2020), academics are afforded choice, potentially highlighting the more holistic nature of other taxonomies.

Examining Anderson *et al.*'s (2001) revised taxonomy with greater depth and considering the more holistic characteristics of other taxonomies will provide academics with an effective starting point for the development of learning outcomes that go beyond the cognitive domain. As noted, there are acknowledged concerns with the quality of learning outcomes (Atkinson, 2015; Meda and Swart, 2018; Newton, Da Silva and Peters, 2020). While issues of quality will not be eliminated by considering how these might be more broadly grounded, revisiting their origin provides a natural starting point for their reevaluation.

Biggs' (2003) constructive alignment is another area for reconsideration, both in terms of the way that it is taught and the way that it is deployed. For some time, I have noticed expressions of frustration or disparaging comments in relation to constructive alignment theory among colleagues who would note in passing that it encouraged 'streamlining'. However, Biggs is highly critical of 'the quantitative outlook [where] learning is conceived as the aggregation of content [and] to be a good learner is to know more' (Biggs, 1994, p. 3). Constructive alignment was in part borne out of recognition of the paucity of typical lecture-style teaching where learners' passive engagement with content was unlikely to result in meaningful learning (Biggs, 1999). It is only when it is rigidly applied in its oversimplified and reductionist form that constructive alignment might be seen to encourage instrumentalism.

The work of Biggs has also been criticized because it is seen to privilege cognitive, as opposed to affective, knowledge (Birbeck and Andre, 2009). This seems not to be the fault of Biggs but can be attributed to wider issues discussed in other parts of the work. In relation to the treatment of the theory itself, however, there may be some oversimplification in the way that constructive alignment is referred to in core documentation or taught. This may fail to acknowledge Biggs' valuing of the 'constructive' element and over-emphasize alignment. For example, Biggs' work is explicitly cited in relation to the use of outcomes-based approaches in QAA documentation (Cleaver and Mclinden, 2021) which makes no allusion to constructivism and its place in constructive alignment. Instead, constructive alignment is cited as a means to maintain academic standards and support quality in the development of courses through the process of alignment (Cleaver and Mclinden, 2021). While the latter is one of the benefits of the use of constructive alignment, it represents only half of the picture. Another example can be found

in the definition of constructive alignment in a recognised handbook for learning and teaching in higher education, where it is described as ‘Ensuring, at least, learning outcomes, teaching methods, learning activities and assessment are compatible with each other’ (Fry, Ketteridge and Marshall, 2015, p. 429). While the ‘at least’ goes some way to alluding to the necessary simplification of the definition, it fails to recognise, as Biggs does, that constructive alignment has two parts.

Constructive alignment is considered a core concept in taught postgraduate teaching certificates for academics (Kandlbinder and Peseta, 2009), and those teaching new academics have an opportunity to ensure that it is more broadly understood. While there are criticisms of outcomes-based approaches, as acknowledged in the introduction, constructive alignment offers a framework for newer academics to ‘hang’ their practice on. Introducing a more holistic discussion of outcomes-based approaches at an early juncture is an appropriate means to encourage confidence before introducing alternatives. More experienced academics may use the deeper consideration of constructive alignment as a catalyst to explore other approaches. This might include open ended design in learning outcomes (Havnes and Prøitz, 2016), personalized approaches with some learning ‘to-be-determined’ (Beghetto, 2019, p. 314) or co-creating curriculum (Bovill, 2020).

The deployment of ‘Bloom’s’ and ‘Biggs’ are seen to be at the heart of a cognitively dominating curriculum in higher education (Atkinson, 2013). Revisiting these key theories that inform curriculum design in higher education with more depth and greater context provides academics with knowledge to make informed decisions on their learning and teaching. Higher education purports to want to change and accommodate a wider range of students but has not seemed willing to adjust systems to make them more accessible (Smith, Greenfields and Rochon, 2021). As those with the most direct impact on the structure of learning and teaching, academics are empowered to drive significant change. Rather than re-creating existing types of learning using existing structures, there are opportunities to choose a different starting point and work more effectively with students. In higher education, change can result from ‘contagion from good examples’, where practice is shared and then applied (Trowler, Ashwin and Saunders, 2014, p. 7); beginning with academic practice offers a bottom-up approach to implementing change.

6.3.3 Aligning educational research with cognitive psychology and neuroscience

Based on a piece of research on live briefs, it may seem an incongruous conclusion to point to opportunities for academics to engage with cognitive psychology or neuroscience. However, the results suggest a disparity between reported and intended learning, indicating that existing ways of thinking about or measuring learning in higher education are limited. Both cognitive psychology and neuroscience highlight that there are far more complex types of learning than academics currently engage with using popular theory. Further, the literature review highlighted opportunities for a more integrated approach to considering alignment between these subject areas.

I have referred on several occasions to *Understanding how we learn: a visual guide* (Weinstein, Sumeracki and Caviglioli, 2019d) a book dedicated to bridging the gap between cognitive psychology and education. This, and a journal entitled *Mind, brain and education: implications for educators* (Butler- Kisber, 2011) which provides insights into neuroscience and its connection with learning were happened upon via chance conversations with colleagues. Although there are significant theoretical links between these subject areas, there is very little to support to connect these in practice.

As an educator with over two decades of experience, I would agree with Weinstein *et al.*'s (2019) assertion that 'educators are highly enthusiastic about what cognitive psychology and neuroscience have to offer education. The problem arises when information about learning is taken out of context and condensed into overgeneralizations' (Weinstein, Sumeracki and Caviglioli, 2019c, p. 31). This is echoed by those working in neuroscience, who observe that 'too often in education, out of the sincere desire to understand and help students, educators have grabbed onto various "brain-based" teaching strategies that are based either in misunderstandings or misapplications of neuroscientific information to education' (Immordino-Yang and Faeth, 2010, p. 68). I would suggest that the lack of more in-depth engagement with cognitive psychology or neuroscience is both linked to the considerable pressures faced by academics as established in the introduction and their absence as part of standard teaching qualifications in higher education.

Current teaching qualifications in higher education are most often linked to Advance HE's UK Professional Standards Framework (Higher Education Academy, 2011) and/or the

Academic Professional Apprenticeship Standards (Institute for Apprenticeships and Technical Education, 2018). Given the broad nature of these guidance documents, it is unlikely that either would point to the specifics of particular subject areas; instead, they advise more generally on the need to include evidence-based approaches. It is these evidence-based approaches that afford opportunities for those teaching on postgraduate programmes to include some grounding in the areas of cognitive psychology and neuroscience. Having taught these qualifications for some years, I am aware of how dense the curriculum may be, and the learning curve for many new academics is significant. There is room, however, to begin to integrate a broader way of considering education. Concepts such as cognitive load may already be familiar to many, and building on this knowledge- or, where needed, correcting misapprehensions, will ensure a more effective deployment of approaches.

For more experienced practitioners, opportunities to apply cognitive psychology may be usefully integrated with established education theory. An example discussed earlier is a study by Kondratjew and Kahrens (2019), which uses the integration of experiential learning together with spaced learning, which is derived from cognitive psychology. There are also opportunities to reconsider educational theory in conjunction with cognitive psychology and neuroscience, and research that attempts to 'retrofit' learning theory with contemporary understandings from cognitive psychology and neuroscience has already started to emerge (e.g. Proctor and Niemeyer, 2020).

The impact of a more integrated approach is to exploit a greater range of knowledge for the benefit and enhancement of learning and teaching. To return to the starting point of the thesis, there is a need to consider different ways of thinking about and measuring learning; engaging with cognitive psychology and neuroscience may assist academics in adopting approaches that complement existing, cognitively focused systems.

6.4 Reflections on my own practice

This research is the culmination of work that emerged from my personal and professional goal of achieving a doctorate. It is appropriate, then, to conclude with a reflection on the impact of the research process on my personal and professional development and practice.

At the end of a doctoral thesis, it seems almost redundant to state that my understanding of the research process has been enhanced through the opportunity of undertaking one. My MA thesis was an extended literature review. While I have engaged in small-scale research activities, I have welcomed the opportunity to undertake primary research with more depth and scrutiny. The structure of the thesis represented a familiar journey that I have guided many MA students through. In undertaking it myself, I was still slightly overawed by the process. The expected breadth and depth of the work was at times overwhelming and I have remained perhaps even more empathetic to the experiences of my own students who have similarly been studying through the additional complication of a pandemic. The methodology, in particular, represented a real learning curve that means that I am now more aware of my own assumptions and able to articulate these philosophical underpinnings within my own teaching. More practically, I have amassed a substantial number of excellent sources that I have already started deploying in my own teaching.

The methodology referred to 'scratching beneath the surface' of 'agreed meanings' (Pring, 2010, p. 56) from a philosophical perspective. However, perhaps the greatest personal and professional benefit of completing this thesis has been scratching beneath the surface of common practices in higher education and the assumptions that underpin them. This research has allowed me to engage in depth with some of the original works that have informed our practice. I had never had the opportunity to read the original and full text of Bloom's *Handbook 1* (Bloom *et al.*, 1956) or *Handbook 2* (Bloom, Krathwohl and Masia, 1964), for example, but only the revised abridged version (Anderson *et al.*, 2001). I was able to read the original *Potato Crisp Pedagogy* that contains the often-cited statement that, 'regrettably, the last thing one learns from is experience' (Aitchison and Graham, 1989, p. 17). I had read parts of John Dewey's works, but not his original work on experiential learning (Dewey, 1938). I knew that the cognitive domain was dominant, but not why. I do not claim to have found all the answers, but I have developed a sound understanding of some of the key reasons why higher education as a sector has deployed theory in the way that it has. Moreover, I have a much deeper understanding of the role of taxonomies in the design of learning.

When I realized that there were such a range of taxonomies available, it felt a little like my first exposure to criticism of learning styles theory. At teachers' college in the 1990s, I was

taught that students had learning styles: visual, auditory, read-write and kinesthetic (VARK) (Fleming and Mills, 1992) and that it was a 'Good Thing' to understand and use this knowledge. I was never taught that there were other theories of learning styles. There was no suggestion of any limitation or criticisms of this theory, and it was not introduced in its intended form, that is, 'above all designed to be a starting point for a conversation among teachers and learners about learning' (Fleming *et al.*, 2006, p. 4). When I came to learn more about learning styles a few years later, much of which is captured in the work of Coffield *et al.* (2004), I felt both improved as a practitioner but also slightly stunned that I had not been given a more comprehensive introduction to VARK, nor had I thought to question it more critically at the time it was taught.

Over two decades later I felt 'fooled again' for not having more critically and comprehensively considered the wholesale application of a single pedagogical theory as is seen with the revised taxonomy (Anderson *et al.*, 2001). Nor had I realized that I was perpetuating misunderstanding by continuing to refer to 'Bloom's', and that the handbooks I relied on for teaching others had oversimplified the revisions made. This is not to say that I will verbally pounce on colleagues or students who refer to 'Bloom's'. I also fear I may dazzle new practitioners to higher education, particularly in the light of their existing learning curve, if I were to try to deliver lectures on different taxonomies at the outset. However, as outlined in earlier parts of the conclusion, I will now offer a more contextualized discussion on the design of learning outcomes. I also feel more equipped to facilitate supported discussions of the development of affective learning, its place and assessment.

Again, to reiterate, I have significant admiration for the taxonomies of Bloom *et al.* (1956). Reading their original work and that of many older publications was a particularly impressive part of my experience. The humility and reflection with which Bloom *et al.*, Dewey and others wrote their seminal pieces is striking. The authors of *Potato Crisp Pedagogy*, for example, include the disclaimer that 'We are saying nothing new' (Aitchison and Graham, 1989, p. 15). I feel much the same in my own writing. The writing of those expert authors is more impressive when contrasted with the more superficial but shouty messaging across the sector and even in academic journal articles, with often-passionate educators wanting to show that something 'works' (Allison and Pomeroy, 2000; Outhwaite,

Gulliford and Pitchford, 2020). As is evidenced by this thesis, reality is often more nuanced. I remain aware of Dewey's criticisms of the *Either Ors* and the necessity and challenge of thinking and communicating with nuance. While I hope that I have always done so, the importance of remaining balanced and bringing a self-critical role to the surface in the face of the *Either Ors* will be an important feature of my practice for the rest of my career.

I was also taken aback by the limited nature of literature that underpinned some of the QAA-supported writing from which significant assertions have been made. As an experienced academic accustomed to telling my learners to engage critically with the writing of others, I was rather caught out by my own assumptions of the expertise of those in positions of academic power.

Everyone who undertakes any kind of academic award will face challenges that emerge both from the content of the award and the way that the associated workload can be managed in conjunction with other commitments. I often remark to my own learners, themselves education practitioners, that what they will submit is the sum of what they are capable of producing and the time that they have available to them. I am proud of having completed this work and acknowledge the barriers - some systemic, some happenstance - that mean it is not the same work that would have resulted without them. In the methodology, I noted that 'I can accept the imperfect nature of the reported perceptions and my own impact on the research process, but still recognise the value that the research has in contributing to a wider understanding in relation to the aim of the research'. I see the same in this thesis: I can accept the imperfect nature of the research experience and the impact that challenges have had on my engagement with it, but still recognise the value that the experience has had on my wider understanding of both the research process and my own practice.

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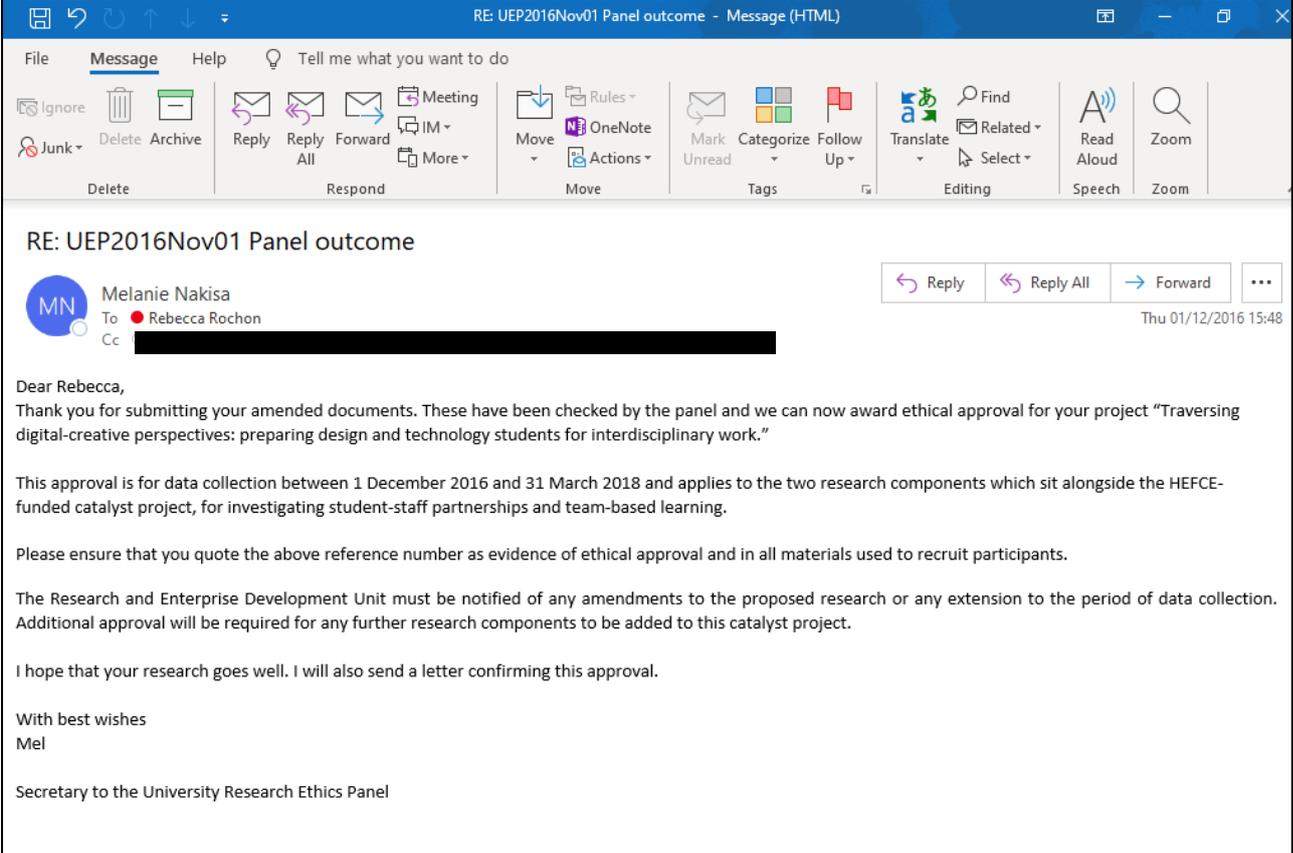
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8 Appendices

8.1 Ethical approval



RE: UEP2016Nov01 Panel outcome - Message (HTML)

File Message Help Tell me what you want to do

Ignore Delete Archive Reply Reply All Forward Meeting IM More

Junk Delete Archive Reply Reply All Forward Meeting IM More

Move OneNote Actions

Mark Unread Categorize Follow Up

Translate Find Related Select

Read Aloud Zoom

RE: UEP2016Nov01 Panel outcome

Melanie Nakisa

To Rebecca Rochon

Cc [REDACTED]

Thu 01/12/2016 15:48

Reply Reply All Forward

Dear Rebecca,

Thank you for submitting your amended documents. These have been checked by the panel and we can now award ethical approval for your project "Traversing digital-creative perspectives: preparing design and technology students for interdisciplinary work."

This approval is for data collection between 1 December 2016 and 31 March 2018 and applies to the two research components which sit alongside the HEFCE-funded catalyst project, for investigating student-staff partnerships and team-based learning.

Please ensure that you quote the above reference number as evidence of ethical approval and in all materials used to recruit participants.

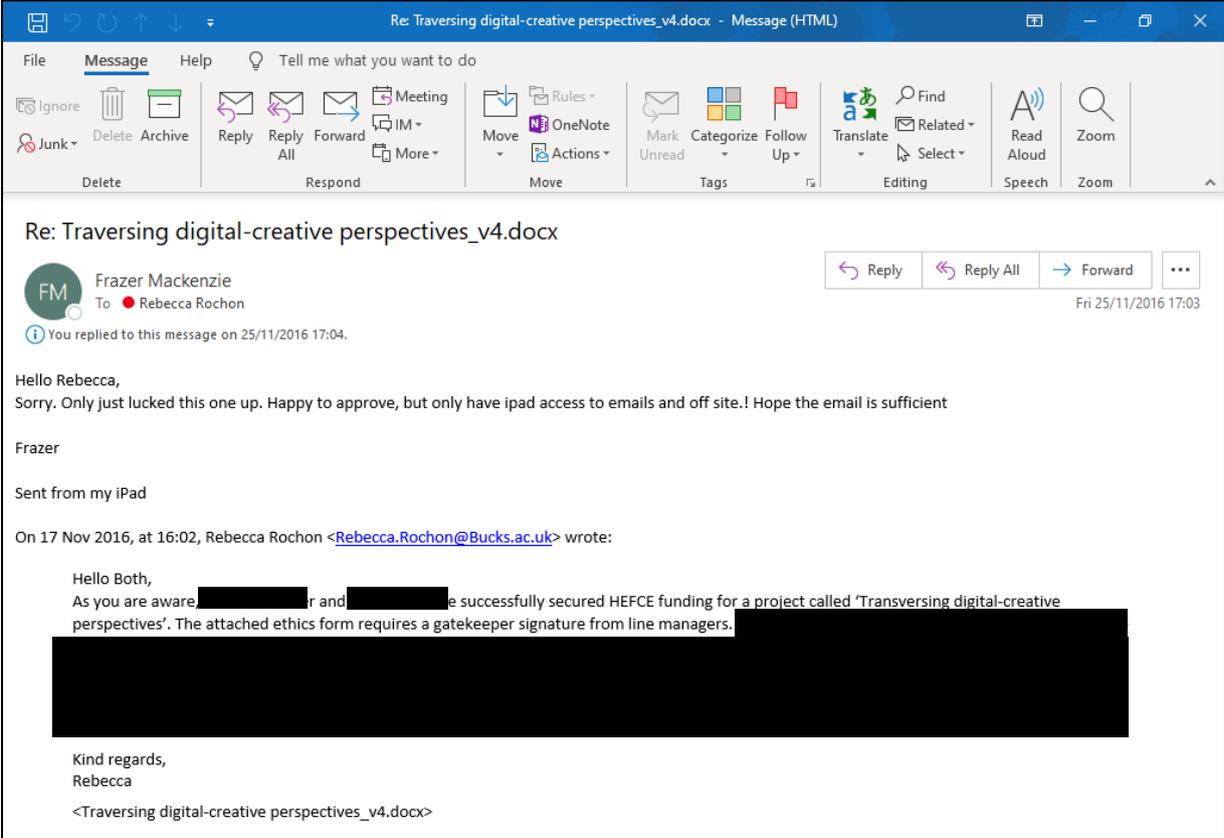
The Research and Enterprise Development Unit must be notified of any amendments to the proposed research or any extension to the period of data collection. Additional approval will be required for any further research components to be added to this catalyst project.

I hope that your research goes well. I will also send a letter confirming this approval.

With best wishes
Mel

Secretary to the University Research Ethics Panel

8.1.1 Gatekeeper permission



The screenshot shows an Outlook window titled "Re: Traversing digital-creative perspectives_v4.docx - Message (HTML)". The ribbon includes "File", "Message", and "Help". The "Message" ribbon has groups for "Delete" (Ignore, Delete, Archive, Junk), "Respond" (Reply, Reply All, Forward, Meeting, IM, More), "Move" (Move, OneNote, Actions), "Tags" (Mark Unread, Categorize, Follow Up), "Editing" (Translate, Find, Related, Select), "Speech" (Read Aloud), and "Zoom".

Re: Traversing digital-creative perspectives_v4.docx

FM Frazer Mackenzie
To: Rebecca Rochon

Reply Reply All Forward

Fri 25/11/2016 17:03

i You replied to this message on 25/11/2016 17:04.

Hello Rebecca,
Sorry. Only just lucked this one up. Happy to approve, but only have ipad access to emails and off site.! Hope the email is sufficient

Frazer

Sent from my iPad

On 17 Nov 2016, at 16:02, Rebecca Rochon <Rebecca.Rochon@Bucks.ac.uk> wrote:

Hello Both,
As you are aware, [redacted] and [redacted] have successfully secured HEFCE funding for a project called 'Transversing digital-creative perspectives'. The attached ethics form requires a gatekeeper signature from line managers. [redacted]

Kind regards,
Rebecca

<Traversing digital-creative perspectives_v4.docx>

8.2 Participant information



Research: Traversing digital-creative perspectives

We are keen to capture your views of working on the live brief project.

Why are you doing this?

We would like a better understanding of how students and staff work together in teams and across faculties and the impact that it might have on learning.

How can I take part?

This research is entirely voluntary; there is no need to take part.

You can participate by taking part in a focus group (scheduled to suit you).

Is there anything else I should know?

Taking part in any of the above activities is **not** part of the module. You will not get 'extra credit' for taking part, nor would you be penalised for not taking part.

What if I sign the consent form but change my mind?

You can withdraw at any point up to the end of the semester when your data will be anonymised and become part of the project. You don't need to provide any explanation.

Will my name appear in any published work?

No. In order to protect your confidentiality names will not be used in any reports or publications.

How can I get more information?

Contact one of the lead researchers:

[details removed]

8.2.1 Consent form



CONSENT FORM: Traversing digital-creative perspectives: preparing design and technology students for interdisciplinary work

Please tick the boxes to demonstrate that you have read and understood as appropriate:

I have read and understood the project information sheet.....

I have been given the opportunity to ask questions about the project.....

I agree to take part in the project focus group:
.....

I understand that my taking part is voluntary; I can withdraw from the study at any time and I will not be asked questions about why I no longer want to take part.....

I understand my personal details such as phone number or address will not be revealed to people outside of this project.....

I understand that other researchers may use my words in publications, reports, web pages and other research outputs.....

On this basis I am happy to participate in the [name of project] study.

Name of Participant Signature.....
Date.....

Name of Researcher..... Signature.....
Date.....

If you have any queries or concerns, please contact:

[details removed]

8.3 Focus group script and questions

Welcome and thank you.

Reminders:

- My name is Rebecca Rochon. My current role is at BNU is as a lecturer in Education. For this project, my role is as researcher on this project called 'Traversing digital-creative perspectives'.
- You are allowed to leave at any time during this focus group- no reason needed. As per the consent form, you can withdraw any time until the end of the semester.
- For students only: taking part in this research is nothing to do with your grade in the live brief.
- I will be recording this so that I can transcribe it, but this data will be stored securely. Your words may be shared anonymously in a final report, but confidentiality will be maintained.

Questions

- What did this experience offer you that was different from others you have been involved with as part of your studies?
 - What about X did you particularly enjoy/dislike? Why?
 - Was your relationship with your lecturer different than in a typical module?
 - What about the project outcome?
 - What was it like working with the client?
- How would you measure/assess your learning in an experience like this?
 - Do you feel that the grade you will receive/have received will reflect all aspects of your achievement?
 - Why or why not?

8.4 Atkinson's Circles

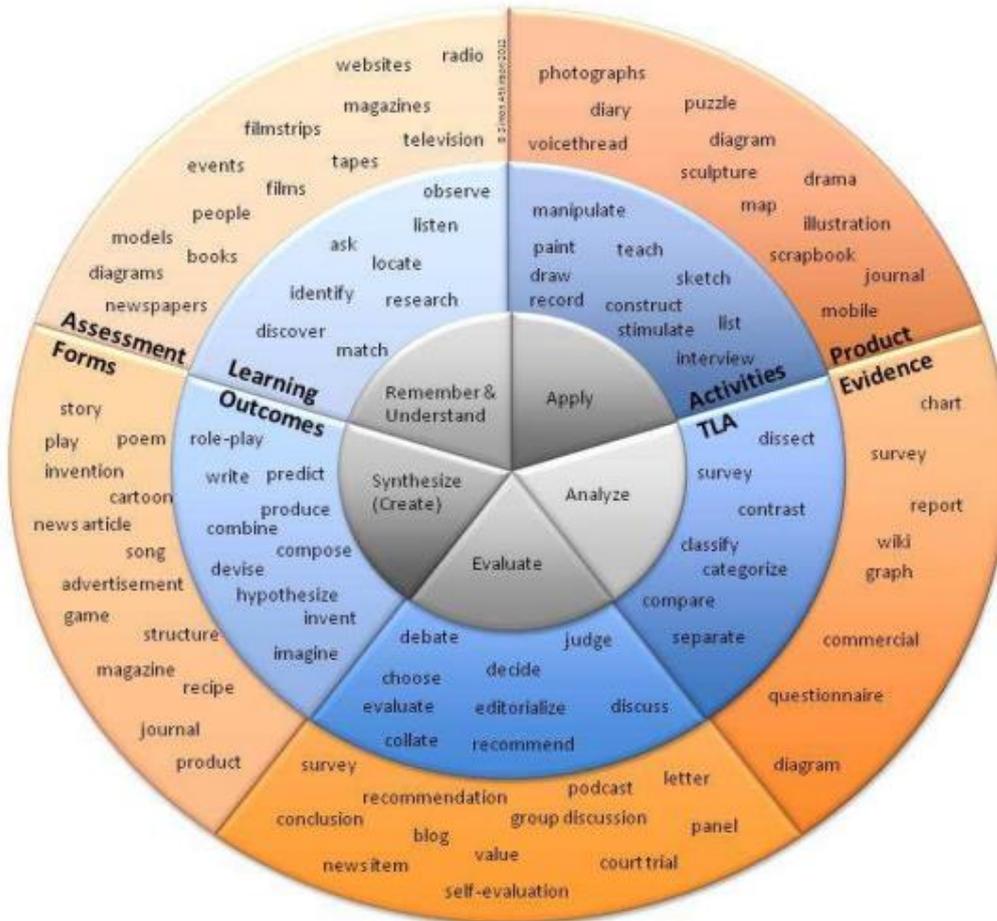


Figure 5: Atkinson's Cognitive domain

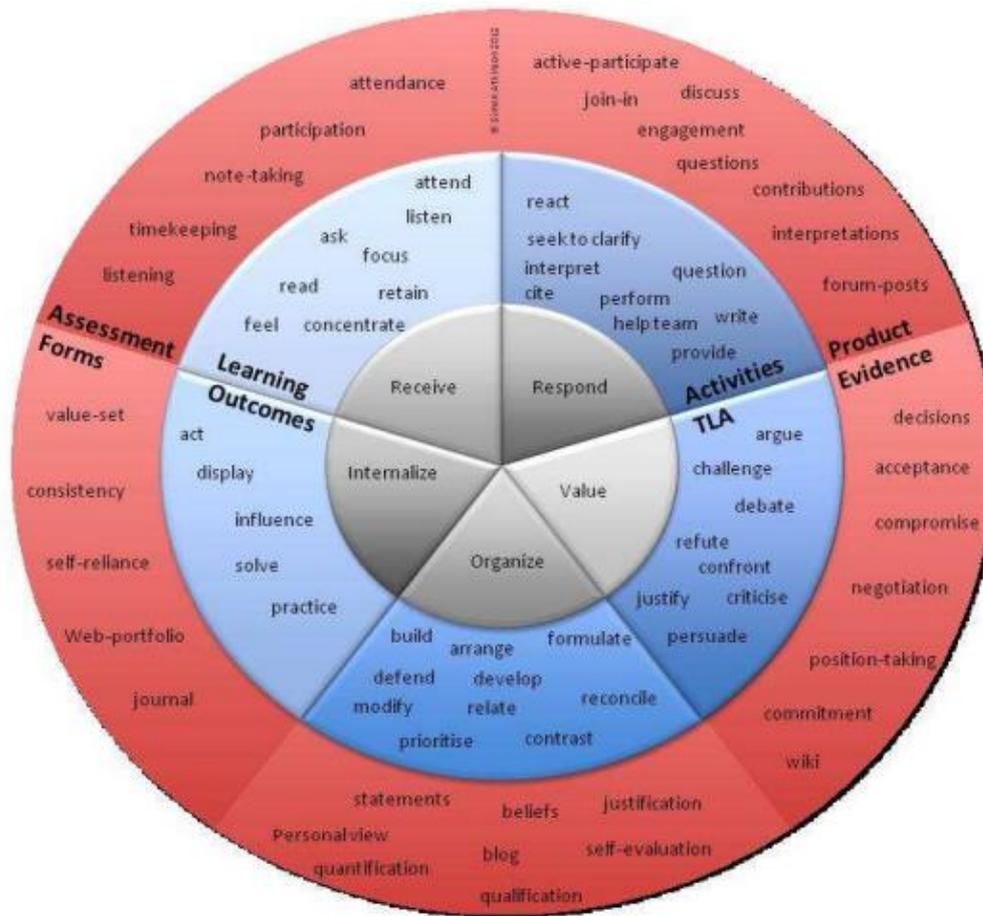


Figure 6: Atkinson's Affective domain

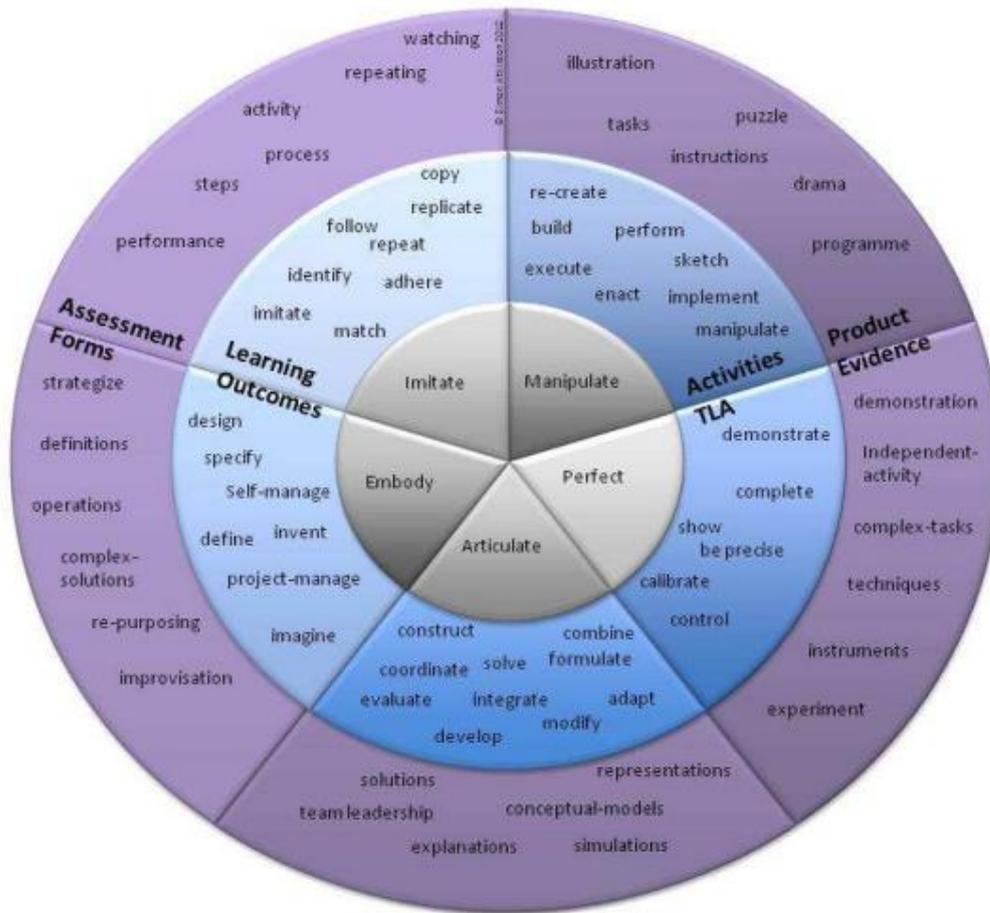


Figure 7: Atkinson's Psychomotor domain

8.5 Anderson *et al.*'s Taxonomy for Learning, Teaching and Assessing

8.5.1 Anderson *et al.*'s Taxonomy (2001)

8.5.2 Anderson *et al.*'s Major Types and Subtypes of the Knowledge Dimension

MAJOR TYPES AND SUBTYPES	EXAMPLES
A. FACTUAL KNOWLEDGE —The basic elements students must know to be acquainted with a discipline or solve problems in it	
AA. Knowledge of terminology	Technical vocabulary, musical symbols
AB. Knowledge of specific details and elements	Major natural resources, reliable sources of information
B. CONCEPTUAL KNOWLEDGE —The interrelationships among the basic elements within a larger structure that enable them to function together	
BA. Knowledge of classifications and categories	Periods of geological time, forms of business ownership
BB. Knowledge of principles and generalizations	Pythagorean theorem, law of supply and demand
BC. Knowledge of theories, models, and structures	Theory of evolution, structure of Congress
C. PROCEDURAL KNOWLEDGE —How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods	
CA. Knowledge of subject-specific skills and algorithms	Skills used in painting with watercolors, whole-number division algorithm
CB. Knowledge of subject-specific techniques and methods	Interviewing techniques, scientific method
CC. Knowledge of criteria for determining when to use appropriate procedures	Criteria used to determine when to apply a procedure involving Newton's second law, criteria used to judge the feasibility of using a particular method to estimate business costs
D. METACOGNITIVE KNOWLEDGE —Knowledge of cognition in general as well as awareness and knowledge of one's own cognition	
DA. Strategic knowledge	Knowledge of outlining as a means of capturing the structure of a unit of subject matter in a textbook, knowledge of the use of heuristics
DB. Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge	Knowledge of the types of tests particular teachers administer, knowledge of the cognitive demands of different tasks
DC. Self-knowledge	Knowledge that critiquing essays is a personal strength, whereas writing essays is a personal weakness; awareness of one's own knowledge level

Figure 8: Anderson *et al.*'s Major Types and Subtypes of the Knowledge Dimension

8.5.3 Anderson *et al.*'s six categories of the Cognitive Process Dimension

3.3 THE SIX CATEGORIES OF THE COGNITIVE PROCESS DIMENSION AND RELATED COGNITIVE PROCESSES*	
PROCESS CATEGORIES	COGNITIVE PROCESSES AND EXAMPLES
1. REMEMBER —Retrieve relevant knowledge from long-term memory.	
1.1 RECOGNIZING	(e.g., Recognize the dates of important events in U.S. history)
1.2 RECALLING	(e.g., Recall the dates of important events in U.S. history)
2. UNDERSTAND —Construct meaning from instructional messages, including oral, written, and graphic communication.	
2.1 INTERPRETING	(e.g., Paraphrase important speeches and documents)
2.2 EXEMPLIFYING	(e.g., Give examples of various artistic painting styles)
2.3 CLASSIFYING	(e.g., Classify observed or described cases of mental disorders)
2.4 SUMMARIZING	(e.g., Write a short summary of the events portrayed on videotapes)
2.5 INFERRING	(e.g., In learning a foreign language, infer grammatical principles from examples)
2.6 COMPARING	(e.g., Compare historical events to contemporary situations)
2.7 EXPLAINING	(e.g., Explain the causes of important eighteenth-century events in France)
3. APPLY —Carry out or use a procedure in a given situation.	
3.1 EXECUTING	(e.g., Divide one whole number by another whole number, both with multiple digits)
3.2 IMPLEMENTING	(e.g., Determine in which situations Newton's second law is appropriate)
4. ANALYZE —Break material into constituent parts and determine how parts relate to one another and to an overall structure or purpose.	
4.1 DIFFERENTIATING	(e.g., Distinguish between relevant and irrelevant numbers in a mathematical word problem)
4.2 ORGANIZING	(e.g., Structure evidence in a historical description into evidence for and against a particular historical explanation)
4.3 ATTRIBUTING	(e.g., Determine the point of view of the author of an essay in terms of his or her political perspective)
5. EVALUATE —Make judgments based on criteria and standards.	
5.1 CHECKING	(e.g., Determine whether a scientist's conclusions follow from observed data)
5.2 CRITIQUING	(e.g., Judge which of two methods is the best way to solve a given problem)
6. CREATE —Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure.	
6.1 GENERATING	(e.g., Generate hypotheses to account for an observed phenomenon)
6.2 PLANNING	(e.g., Plan a research paper on a given historical topic)
6.3 PRODUCING	(e.g., Build habitats for certain species for certain purposes)

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Figure 9: Anderson *et al.*'s six categories of the Cognitive Process Dimension

8.5.4 Operationalising Anderson *et al.*'s framework

FIGURE 3.1 HOW AN OBJECTIVE (THE STUDENT WILL LEARN TO APPLY THE REDUCE-REUSE-RECYCLE APPROACH TO CONSERVATION) IS CLASSIFIED IN THE TAXONOMY TABLE

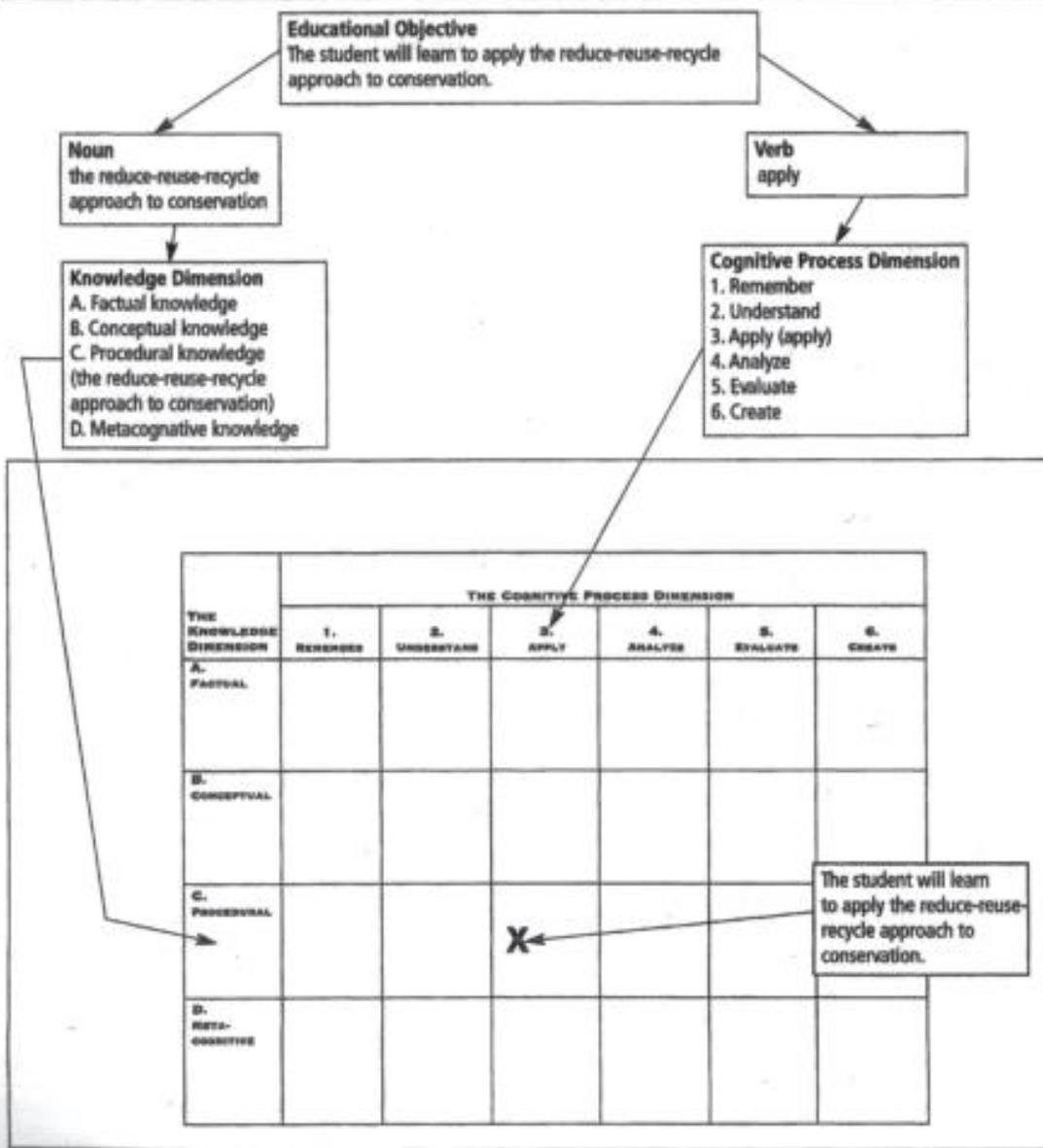


Figure 10: Operationalising Anderson *et al.*'s framework

8.6 Learning outcome mapping: Bloom's Revised Taxonomy (Anderson *et al.*, 2001)

	Cognitive process domain					
Knowledge domain	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create
A. Factual knowledge						
B. Conceptual knowledge		Interpret and implement a software design that incorporates data structures (Bc, 2.1)				
C. Procedural knowledge			<p>Assimilate research methods, craft skills, personal visual language and relevant media into illustrative project work (Cb, 3.2)</p> <p>Demonstrate competence in applied and industry-relevant graphic design studio skills (Ca, 3.1)</p> <p>Demonstrate competence in applied and industry-relevant studio skills (Ca, 3.1)</p> <p>Use contemporary design software and technology to solve creative problems (Ca, 3.2)</p> <p>Demonstrate a fluent assimilation of technique, style and media in graphic project work (Ca.3.2)</p> <p>Use contemporary design software and technology to solve creative problems (Cc, 3.2)</p> <p>Demonstrate applied and industry-relevant graphic studio skills in a variety of formats (Ca, 3.2)</p>	Critically analyse a given scenario to determine the most appropriate data structure/s to be use (Cc, 4.2)	<p>Evaluate, from requirements specifications/definitions, and propose Design Patterns appropriate to application architecture and implementation* (Cc, 5.2)</p> <p>Evaluate, articulate and apply a sound understanding of the complex parameters of a range of data structures, in order to interrogate a given problem* (Cc, 5.2)</p> <p>Critically evaluate the structures and intentions of major Design Patterns (Cc, 5.2)</p>	Develop creative solutions using contemporary design software and technology (Cc, 6.3)
D. Metacognitive knowledge			<p>Assimilate research methods, craft skills, <u>personal visual</u> language and relevant media into illustrative project work (Da, 3.2)</p>			

8.7 Learning outcome mapping: Atkinson (2013) Taxonomy Circles

Learning Outcome	Domain/Category/Verb
1. Evaluate , articulate and apply a sound understanding of the complex parameters of a range of data structures, in order to interrogate a given problem*	Cognitive/Evaluate/Evaluate
2. Interpret and implement a software design that incorporates data structures*	Cognitive/Analyze/Dissect
3. Critically analyse a given scenario to determine the most appropriate data structure/s to be use	Cognitive/Analyze/Dissect
4. Critically evaluate the structures and intentions of major Design Patterns	Cognitive/Evaluate/Evaluate
5. Implement Design Patterns in one or more object-oriented language	Cognitive/Apply/Construct
6. Evaluate , from requirements specifications/definitions, and propose Design Patterns appropriate to application architecture and implementation*	Cognitive/Evaluate/Evaluate
7. Assimilate research methods, craft skills, personal visual language and relevant media into graphic design project work	Cognitive/Synthesize/Combine
8. Demonstrate competence in applied and industry-relevant graphic design studio skills	Psychomotor/Perfect/Demonstrate
9. Use contemporary design software and technology to solve creative problems	Psychomotor/Articulate/Solve
10. Assimilate research methods, craft skills, personal visual language and relevant media into illustrative project work	Psychomotor/Synthesize/Combine
11. Demonstrate competence in applied and industry-relevant studio skills	Psychomotor/Perfect/Demonstrate
12. Use contemporary design software and technology to solve creative problems	Psychomotor/Perfect/Demonstrate
13. Demonstrate a fluent assimilation of technique, style and media in graphic project work	Psychomotor/Perfect/Demonstrate
14. Demonstrate applied and industry-relevant graphic studio skills in a variety of formats	Psychomotor/Perfect/Demonstrate
15. Develop creative solutions using contemporary design software and technology	Psychomotor/Articulate/Solve

