Student and Lecturer Reflections on Merging the Physical and Digital Classroom with a 'Tech and Tactile' Approach

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Abstract

This paper shares lecturer and student reflective accounts of a 'tech and tactile' approach to delivering BA (Hons) Early Childhood Studies and BA (Hons) Early Childhood Studies with Early Years Teacher Status courses. The 'tech and tactile' approach combines gamification, playful pedagogy, digital, creative and tactile methods of facilitating learning. Every task has a concurrent physical and digital counterpart, or the digital and physical tasks are purposefully sequenced. The paper shares examples of reflections that convey that students are not sedentary or attached to their device. Instead, the embedded digital and physical elements enabled attendance and engagement to be magnified. Furthermore, the approach accommodates multiple learning styles, preferences and needs by allowing a choice of subject content based on context and digital literacy. The approach was well-received by students who value its tacit, multi-modal and self-referent nature. The paper proposes a cyclical approach to curriculum planning and reflective questions which are transferable across disciplines for lecturers wishing to adopt the 'tech and tactile approach.

Key words: Technology, Tactile, Digital, Physical, Classroom, Creativity, Pedagogy

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Introduction

This paper aims to convey an account from lecturer and student perspectives of implementing a 'tech and tactile' approach to delivery of the BA (Hons) Early Childhood Studies and BA (Hons) Early Childhood Studies with Early Years Teacher Status courses. It will apply Brookfield's (1995) model using the proposed 4 lenses for reflection (self, student, professionals, scholarly) by combining lecturer and student reflections, student feedback, research and theoretical perspectives , thus conveying reflections on the 'tech and tactile' approach from multiple vantage points. Overall, the paper includes explanation of the pedagogical perspective and sector backdrop underpinning of the approach, descriptions and feedback of how it manifested in practice, lecturer and student reflections, outcomes of the approach and recommendations for future practice.

Pedagogical Context

Technology has immensely enhanced the experience of students in higher education (HE). The OFS (2020) Teaching Excellence Framework includes students' experiences of contextual, relevant and meaningful uses of technology, and JISC (2021) has developed a 4 year strategic plan to ensure HE is empowered by technology in: culture and leadership; reframing the student experience; reimagining teaching, learning and assessment; and transforming infrastructure. Covid-19 has also meant that technology has been the vehicle for most teaching and learning experiences for many students despite the research findings in the sector and student voice being very mixed (OFS 2019).

It is important to engage in regular reflective practice, especially during times of significant change in an industry. Reflective practice underpins the role of the educator from the early year's sector through to HE institutes. Gray (2013) states that reflection is vital for: the learning and development of all

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involved; the quality of service provided; and the professional capability of the teacher. Morley and Jamil (2021) echo this for HE and identify that over the last two decades it has been important to reflect on the student experience to respond to student voice and provide meaningful learning with relevance to employers and career goals.

The research and theoretical perspective underpinning the 'tech and tactile' approach includes Baltes (1987) lifespan theory of maturation, learning and development which identifies that progression and preferred learning styles are a result of a dynamic interplay between context, personal gains and losses, neuroplasticity and multi-disciplinary perspectives. Therefore, each learner is unique with their own story. Baltes (1987) thoughts are arguably dated, but remain poignant in how educators and psychologists understand learning and development across the lifespan. In relation to Baltes' (1987) life phases, learners at university are typically in the early or middle adulthood phases of their lifespan. Lally and Valentine-French (2019) identify that, at this stage of life, learners seek relevance and personal value in order to retain and remember skills and knowledge, and so benefit from real-world, community and collaborative modes of delivery. Lally and Valentine-French (2019) propose this is due to memory retention declining with age, so more effortful activity is required to ensure these learners retain the information. Education that is more relevant to them and their life course, i.e. with more memorable and experiential context, has a greater chance of being successful. In this way the 'tech and tactile' approach responds to the lifespan developmental needs and learning preferences of students in HE.

Since personalised and responsive learning is important in HE, it is frequently termed *student-centred* learning, and, while Robinson (2016) suggests that HE institutes are often perceived as impersonal in content delivery, innovative educators do utilise approaches that acknowledge each student as having their own desired outcomes. Furthermore, within early years sector, *A Unique Child* (DfE 2021) is a principle of all practice, and, to respond to the HE backdrop (Office for Students 2021; JISC 2021), it is important to strive for

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high quality learning experiences through innovative delivery modes such as 'tech and tactile' which cater for the unique and bespoke requirements of students, employers and future career goals (Morley and Jamil 2021).

The foundation for using the 'tech and tactile' approach in HE stemmed from the author's background in the subject area. It was felt important to use early years pedagogy within the BA (Hons) Early Childhood Studies and BA (Hons) Early Childhood Studies with Early Years Teacher Status courses to add authenticity, real-world context and enhance students' professional toolkits by role modelling. Sproule, Walsh and McGuiness (2019) identify that early years pedagogy incorporates a plethora of dimensions of play, and it is important that these find their way into the trainee's classroom. Loebach and Cox's (2020) typology of play incorporates digital, physical, exploratory, bio, imaginative, rules, restorative and non-play, and it is necessary to role model each of these to encourage students' learning. This play typology has been embedded within the 'tech and tactile' approach.

Kapp *et al.* (2014) highlights that play is often embedded in HE through gamification of learning, where there is a playful game-like element to a learning activity, or, game-based learning, where playing the game itself is the vehicle for the learning which can be digital, physical or both. Such games and playfulness are a mechanism to draw learners into the *flow* or *zone* of the activity, which can be very beneficial for learning in middle adulthood. (Lally and French-Valentine 2019). *Flow* can be described as the height of enjoyment; the more it is experienced, the more individuals judge their lives to be gratifying (Csikszentmihalyi 2002). Similarly, according to Lally and French-Valentine (2019) tacit knowledge is also well-developed in middle adulthood and can contribute to learning. Such knowledge is pragmatic and practical i.e. it is learnt via experience rather than directly taught.

Overall, by incorporating playful, gamified and game-based activities to elicit *flow* and tacit learning, the 'tech and tactile' approach is meaningful and

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relevant to Early Childhood Studies students in terms of their subject knowledge, phase of life, unique needs and career goals.

How does the 'tech and tactile' approach manifest in practice?

In the Early Years sector cyclical approaches to planning are often implemented in advance, in the moment or retrospectively. The cycle includes observation and information gathering, followed by planning and implementation of activities, and finally evaluations (Grenier 2020; DfE 2021; Early Education 2021). The 'tech and tactile' approach incorporates this planning by, firstly, observing students to learn their preferences, interests and skill sets. Following this, responsive activities are designed and implemented to incorporate what has been learnt, and these are followed by evaluation (Fig 1). As this is akin to the approach currently used in the Early Years sector, it is relevant, real world and authentic to use with students on the BA (Hons) Early Childhood Studies courses.

The approach is influenced by Bloom's (1956) Taxonomy of Learning and Churches' (2018) Digital Taxonomy which ensures that the content and difficulty of an activity progresses in a regular fashion. Therefore, activities that encourage memory, secure understanding and application to practice are implemented before activities that elicit analysis, evaluation and creativity. This is important for both the subject material and digital literacy. Hence, the successful merger between the physical and digital classroom begins in a familiar manner, before becoming increasingly challenging.

As a result of cyclical planning and taxonomy of progressive learning, students have 'tech and tactile' activities running concurrently or sequentially, whereby each physical aspect has a digital counterpart and vice versa.

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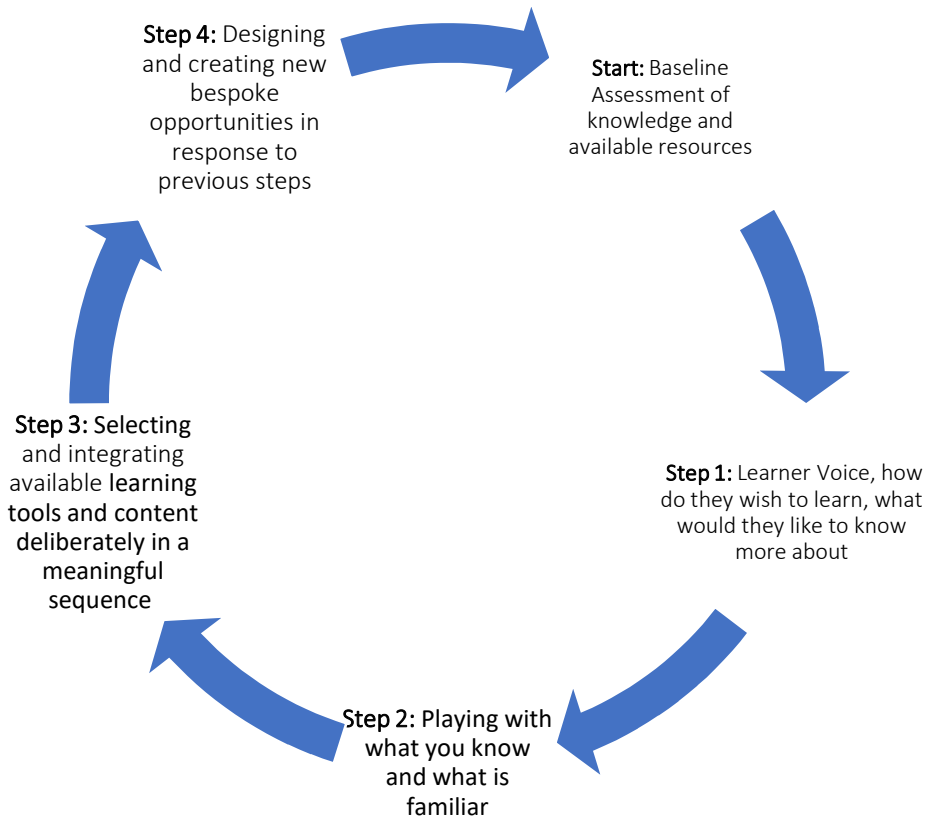

Fig 1. Tech and Tactile Planning Process

Methodology

It is important to acknowledge the practitioner researcher positioning of this paper as context for the 'tech and tactile' approach, and the subsequent research and reflection on it. Newman and Leggett (2019) identify that practitioner research in education empowers its relevance for the educators and their professional learning. In essence, it makes findings, discussion and impact more meaningful to all those with a stake in the research. This is important because it responds to the necessity of making HE experiences for students relevant to their career or study journey. Furthermore, in the current context, both practitioner researchers and students can acknowledge their industry background as Early Years professionals in the field of primary school

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and private early childhood services. Overall, practitioner research seems best suited to the context and purpose of this investigation.

The research took place within the BA (Hons) Early Childhood Studies and BA (Hons) Early Childhood Studies with Early Years Teacher Status courses part-time and full-time routes. It involved 98 students experiencing 'tech and tactile' pedagogy, and the methods of data collection included self-elected student written comments left behind after sessions together with reflections from 3 self-elected students studying at HE levels 5,6 and 7 respectively. This approach mirrors that utilised daily in the Early Years sector where observations of children's engagement and development seek to be entirely natural and self-generated. Naturalistic inquiries are particularly beneficial for qualitative data (Bassey 1998) because they provide the closest *in the head* perspective of participants. They use no means of purposefully eliciting thoughts from students, but simply provide a vehicle for them to feedback should they wish. In the present study, this approach kept findings informal, unforced and organic; thus providing real-world insights from the 'tech and tactile' classroom.

The research of Ciuffetelli Parker *et al.* (2017) identifies that being involved in narrative inquiry as an educator enables conscious dialogue both internally, and with colleagues and learners; this is beneficial to both practice and research. Furthermore, this perspective resonates with Brookfield's (1995) approach to reflection. For a practitioner-researcher, reflexivity entails thinking from both viewpoints resulting in multi-faceted evaluation. Huber*et al.* (2013) also highlight that, in education, narrative and natural inquiry makes way for living, telling and reviewing pedagogy. The consequent innovation and shaping of classroom approaches is explicitly suited to this study.

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Findings

These findings feature examples of classroom feedback and lecturer and student reflections. The findings represent the lecturer's thinking and telling the story as it happened, and so are often written in first person.

Example from practice: Electronic Scavenger Hunt (ESH)

This example was developed in response to student feedback from previous modules which included: "More hands-on learning approach"; and "Less PowerPoints, more opportunity to chat as I get more from this."

This suggests these learners enjoy active and cooperative learning which arguably relates to multiple intelligences described by Gardner (1983) whereby students enjoy, interpersonal, intrapersonal, spatial, logical, linguistic, creative, or natural content. Additionally, the students are requesting the opportunity to take responsibility and engage in more group work involving cooperative structures in which the principles of learning are positive interdependence, individual accountability, equal participation, and simultaneous interaction (Kagan 2009). These led to the adoption of a student-centred approach.

Student-centred approaches permit educational progressivism (Lal 2005) where the student can choose a task, a reading resource, or problem which meets their need. However, as Lal (2005) notes, this approach is not without critics who believe essentialism and realism in teaching are necessary beacuse those with *expert power* (French and Raven 1959) can cascade content that a student centred approach may not, and, as a result, the student may not be appropriately challenged or set on task. However, a potentially less authoritarian middle ground, and more current approach is possible.

In the present example, students were familiar with reading and understood its necessity, so I used reading as the familiar ground, and decided to

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respond to their comments and gamify reading using Kagan's (2009) cooperative learning and a 'tech and tactile' ESH. The students put themselves into teams and were assigned tasks which had points attached to them. They started for fun first with tasks requiring lower order thinking skills (Bloom 1956; Churches 2018). Their first task was to take a team *selfie* photograph before doing tasks such as *sir reads a lot* which required students to read a lot of materials and, as the tasks increased in difficulty, they were provided with digital or physical choices.

The app used for the ESH was GooseChase, which was unfamiliar to the students and so challenged their digital skills. However, I also embedded familiar digital features such as the institute's online library and Blackboard virtual learning environment. Additionally, the students could choose which digital devices they used. The tactile element included physical books and note taking options.

The anecdotal feedback from students during the ESH session itself was 'I love learning like this', and, whilst some of my mature learners remarked 'I like leaving the tech to the young ones while I read this', the options available enabled equal participation within groups, with collaboration and choices of engagement being made based on unique preferences and skills. The digital and physical aspects of the activity were of equal value, and hearing and heeding the student voice during the activities helped progress learning back to the start and step 1 (Fig 1) of the next activity.

As a result of the experience and success of the ESH, I applied for my institute's own Teaching Excellence Fellowship (TEF) tenure and was successful. This gave me the opportunity to dedicate time to developing the 'tech and tactile' approach, whilst collecting student feedback for research and reflective purposes, and, finally, to cascade my learning as a result.

The remainder of the findings are from research conducted during my TEF tenure.

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Example from practice: Montessori Observation Skills Activity (MOSA)

Previous student feedback on the Advanced Child Development module included students being keen to actively practice their observation skills prior to professionally conducting observations in their placements or workplace i.e. students recognised the need for classroom activities replicating and preparing them for real-world work (Morley and Jamil 2021). Therefore, I designed an activity for the following cohort whereby they were required to develop the art of observation based upon the Montessori (1909) theoretical method i.e. by immersing into the room as solely an observer rather than practitioner. This encouraged the students to engage in tasks which could trick their senses, leading to a renewed appreciation of how their observation and senses can be influenced.

During the activity 'tech and tactile' counterparts were available to engage students' multiple senses. In the physical classroom students could smell different liquids and work out what each one was. They were also offered an opportunity to taste popcorn to ascertain if it was savoury or sweet, had access to Playdough to explore touch, and were presented with visual and auditory illusions. Simultaneously they had the option to access our Microsoft Class Notebook space to engage with the same tricks digitally. For example, for physical senses there were instructions for the Aristotle illusion (Baysan and Macpherson 2017) to trick their sense of touch. This offered them a choice of learning, which expanded accessibility, increased engagement, and led to a fascinating discussion concerning proprioception (a debated sixth sense). Furthermore, the digital option keeps the task inclusive for those with allergies or sensory processing disorders. Those who preferred to not use their senses accessed the digital space first, which benefitted their digital skills. Equally, those who engaged physically became intrigued as to what was available digitally, so also accessed those resources. Consequently, the MOSA activity developed both 'tech and tactile' skills through involving both physical and digital classrooms.

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These findings are compatible with previous research and theorising. Brookfield's (1995) research into perceptual learning and the physical embodiment of learning indicates a two-way relationship between our senses and cognition, and Dempsey-Jones *et al.* (2016) suggest that eliciting tactile learning can simultaneously activate cognition. Furthermore, these views link with Gardner's (1983) learning styles theory whereby learner preference can be stimulated from any domain, and Collins, Azmat and Rentschler (2019) state that activities which are inclusive of varying needs are required if HE is to bring all learners along on their journey.

Example from practice: Collaborative Working Module (CWM)

The upscale of the 'tech and tactile' approach led to its consistent use for the CWM. Therefore, each element of every session had a physical and digital counterpart e.g. formal classroom discussions had an opportunity to simultaneously share comments via Microsoft Teams, and each item of physical work was captured and added to Class OneNote enabling collaboration beyond the session. This ensured the availability of the module and its resources regardless of location and time. Thus the 'tech and tactile' approach organically facilitated blended learning as a pedagogical response to students' requirements with delivery at times hybrid, i.e. with some students in class and others learning remotely, to respond to individual circumstances. While the QAA (2020) and JISC (2020) both offer guidance on developing blended and hybrid approaches, 'tech and tactile' organically enables learners to choose by themselves.

Student Reflection 1

When I studied my post grad PCET course last year I had to write up a research project whilst on placement at Newcastle under Lyme College. Whilst completing my PG teacher training, the college had a no phone policy in the

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classroom and this really interested me especially in the technological climate we are in, I was surprised at the anti-phone approach. I decided to centre my research project around that and began to use techniques I had seen been used by yourself in the classroom to engage the learners and to inject something different into their learning environment.

After I had conducted my research and gained feedback from learners and lesson observers it was clear that incorporating positive mobile phone usage and a range of apps supported the learner's development in the classroom. We now as a department use a range of apps to engage the learners and products such as wireless keyboards that can sync to their phones to type up any notes. Whilst we don't (yet) have Teams, we have picked apps that can mirror the benefits I remember from Teams.

I also took inspiration from your STEM rich (tactile) approach and incorporate that into EVERY lesson I teach, the learners give lots of positive feedback and love a more practical approach to learning. A recent example was using dough to represent brain development and memory, they really enjoyed that! Yesterday I had my level 2 students and over the last couple of weeks they have been designing shirts in groups and making them to represent a food group to present to the class, they absolutely loved being creative and learnt so much without even noticing!

As a learner myself I had not been exposed to a tactile and tech rich approach until I began my journey at university. Having forums set up by yourself and being able to video call for a tutorial meant that I felt very supported throughout my degree and opened up doors to a more diverse way of learning and communicating within the classroom.

For me learning and teaching needs to continually evolve with the fast pace technology that we are surrounded by and in order for us to continue to develop and grow as both learners and educators we must embrace the change which is what I felt you were doing with all of your lectures and tutorials.

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Your approach to teaching and learning has inspired and shaped the lecturer and early years practitioner that I now am, and I will be continuing to pass on such fabulous practice to my wonderful early years students!

Student Reflection 2

From my point of view now with training to teach, the impact has been on the format of PowerPoints and I think with yours being so engaging I try to adopt the same way. I know that it works for students, you can have a boring PowerPoint and there's no effectiveness as you can see the students just snooze off. But PowerPoint can be straight away engaging, particularly with it being colourful. Your tech has always looked nice, and if something doesn't look nice, it's doesn't have an impact.

Also having the practical sort of element to a session is always nice for me as a student and my own students, because they can see both sides, the theory and practice, and you've always done that with the teaching with me. I feel that works for me and I learn like that, so it definitely affects learning styles (mine and my learners).

I've adopted your approach using engaging tech and practical activities at the same time, and the feedback from my learners is that they love it and everybody else I work with is boring! I didn't even know I was going to head this way [career choice into teaching post compulsory learners] because with your sort of teaching, it's been an example for me, so I have obviously taken that on and it's worked for me. I am confident to trial and test your ways of teaching because it might work for them.

The practical sessions you did, especially the one using our senses, I still remember now. We had the senses activity and you provided the various bits and bobs that we were smelling, touching, thinking about our feelings… that lesson still sits with me. I think those elements to teaching will always work with students, especially at 16 and 18 years old when they don't want just

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boring PowerPoints or to sit writing. I remember your methods from my first module and I remember how the class all said how we didn't like giving presentations, but because of the tech and tactile ways of teaching, we developed confidence and now I am presenting and teaching students which I didn't think I'd do. I now push my learners to have a go using your methods to build their confidence.

I feel like my journey from level 4 just wouldn't have happened if I hadn't had lecturers like you, you've demonstrated and proved you know what's best for us because I'm doing the same thing with my own teaching tools.

The use of Twitter has also stayed with me, and I find my learners are very comfortable with this. I follow your practice from I'm still using it now to keep learners engaged. I have had a brilliant experience, you're just brilliant at what you do, and thank you for still having an impact on me.

Student Reflection 3

I do feel like it [tech and tactile approach] had an impact within the learning because we could go on Teams and access all the resources that you put on and what you delivered in class put into OneNote. It could help refresh your memory when writing the assignment.

You were always available either on Microsoft Teams or email, I have carried on using Teams this year with my friends independently.

I can't say I've really taken the tech and tactile approach into practice yet, but I would definitely consider taking it into practice when I start in schools because then that would be a good way of communicating with all the teachers and sharing different ideas.

I remember being able to apply theories in activities and share digitally, so it all comes together for us as learners. I still use these methods and do activities with myself in my own study time.

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Student Quotes Following 'tech and tactile' Sessions

> "This session was great as it has mixtures of activities e.g. group work on technology and paper based"
>
> "The session was engaging and flowed between the activity types. I got what information I needed and feel reassured"
>
> "The session was very good because we had different activities to help us understand"
>
> "The activities were really useful and enjoyable and offered an alternative way of learning that I prefer to engage with"
>
> "Lovely engaging lecture as always. Very interactive. Always so helpful"
>
> "A very interactive session, everybody was involved. It was enjoyable and knowledgeable. Very informative session"
>
> "Another interactive session, not just sitting and listening. Lots of groups work and opportunities to explore our senses"
>
> "Good session, I liked the different style of teaching e.g. using senses and tech"
>
> "I enjoyed the group work in this session and sharing information digitally as it helped further my knowledge of the topic area"

Study Outcomes

Three key themes have emerged from designing, implementing and reflecting upon the 'tech and tactile' approach.

Firstly, this approach is timely in terms of responding to the Covid19 impact on HE delivery; throughout the pandemic little changed in the 'tech and

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tactile' approach. Student reflections showed the unchanging importance of key aspects of the 'tech and tactile' approach such as providing choice, avoiding sedentary learning, and eliciting art, design and production. In particular, students were attracted to the experiential and active elements of 'tech and tactile' delivery; a finding that relates to work of Ferrera (2014) who identified the importance of the complex network of perceptual, bodily and thinking experiences of students as important factors in successful multi-modal delivery.

More broadly, Dempsey-Jones *et al.* (2016) have suggested that perceptual learning is *perceptuo-motor* i.e. it combines the cognitive and physical domains and there are synergies within our findings to the work of Moreno and Mayer (2007) who developed a cognitive-affective theory of learning with media (CATLM). Their CATLM has 4 key aspects: 1. learners process different external modes through separate processing functions; 2. each processing function has a limited processing capacity within working memory; 3. meaningful learning occurs when newly processed information is appropriately selected, organized, and integrated with already existing knowledge; and 4. learners' cognitive engagement with the multimodal environment is influenced by motivation. Whilst it could be argued that the findings within this paper echo these 4 aspects, Moreno and Mayer (2007), and later Magana *et al.* (2019), focus on learning through haptic technology, i.e. technology that is often manual or wearable and can create an experience of touch by applying forces, vibrations, or motions to the user. While the 'tech and tactile' approach could adopt more haptic technology in future, its perceptuo-motor elements are not only technological. It has been shown that multi-modal delivery has a greater influence on students' assessment success than single modality (Magana *et al.* 2019). Therefore the 'tech and tactile' approach of keeping the touch element broad is favoured. This may be particularly important for online, blended or hybrid courses where students spend more time with their smart devices. In such situations, lecturers should consider

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'tech and tactile' opportunities to maintain the multi-modality that physical classrooms and resources provide.

Secondly, students saw the benefits of the 'tech and tactile' approach to their own study and professional goals. Through their own learning via osmosis they identified explicit examples where they could apply the 'tech and tactile' approach in their own practice. This outcome marries their HE teaching and learning experience with their lifespan development stage (Lally and French-Valentine 2019). Tacit learning is profound in middle adulthood, and students actively sought and recreated such activities in meaningful ways. Morley and Jamil (2021) conclude that this is key in providing purposeful and relevant HE experiences.

Finally, there is capacity to be reflexive within the 'tech and tactile' approach. This is shown by Fig 1, and within the examples from practice included in the Findings. Similarly, our own upscaling and evolution of the approach together with its reproduction by students shows that 'tech and tactile' methods can be self-referent and transferable. Technology can provide an avenue to reimagine the full HE experience (JISC 2021), and when empowered with options to engage, students begin to contribute themselves.

Conclusion and Recommendations

The 'tech and tactile' approach was well received by students who themselves identify the importance of using their cognitive and psychomotor abilities, and feelings within both digital and physical environments (Bloom 1956, Churches 2009). That students applied this approach independently in their personal study and work suggests that this method can be relevant and purposeful for their HE experience and career, and key to the future of HE (Morley and Jamil 2021).

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The 'tech and tactile' approach shows promise and therefore the following recommendations are suggested:

- The 'tech and tactile' approach should be recreated in different disciplines by following the planning cycle in Fig 1 and by discipline experts who are self-referent and have access to multi-modal options.
- The 'tech and tactile' approach should always be accompanied by reflexive questions about how student learning and perception is elicited in physical and digital arenas. It is important to reflect on whether or not the physical embodiment of learning is being incorporated and how the simultaneous activation of cognition, perception and motor movement is been considered.

Author's Disclosure Statement

All materials included in the article represent the author's own work and anything cited or paraphrased within the text is included in the reference list. The work has not been previously published nor is it is being considered for publication elsewhere. There are no conflicts of interest that would influence the findings and dissemination of this paper.

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