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Wider-sensory exploration: Fostering curiosity in teaching and learning strategies

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Abstract
This article explores how wider-sensory engagement in the curriculum can foster and stimulate curiosity in teaching and learning. By discussing research on curiosity, the development of a hypothesis on curiosity cultivation and workshop case studies, it also attempts to demystify curiosity. With the aim of instigating discussion on how teaching strategies can develop more measurable indicators of curiosity, it considers potential tangible methods of stimulating wider-sensory engagement within the student learning experience to inform creative and research outcomes. These include enabling educators to share discussions on how we could embed and incorporate wider-sensory creative provocations in assignment briefs.

Keywords
sensory engagement; curiosity; curriculum design; strategy; assessment; reflection

Introduction: curiosity and the creative academic landscape
There are widely varying perspectives on the components and attributes of creativity and creative ability. More often than not, ideas are predicated on numerous factors, drawn from a broad range of commonly agreed attributes, including the ability to bring something entirely new into existence (Boon, 2015, p.16). Creativity is also connected to a principle and practice, which turns new and imaginative ideas into reality (Naiman, 1999). While there is no doubt that there is a broad and contrasting spectrum of definitions, perspectives and meaning, one of the constituents commonly associated with the domain of creativity is unbounded curiosity (Johnson, 2011, p.172).

While the act of curiosity is innate and instinctive, it is complex in its tangibility – in how these relate to creative practice and application. It is therefore useful to get a basis understanding of the physiological remit of curiosity, as a cognitive behaviour that is controlled and managed by the 'reward system'. Reward systems are a group of neural structures that are activated and mediated by dopamine. Dopamine is the neurotransmitter that stimulates and influences the cognitive, sensorimotor and limbic systems, the latter of which is associated with motivation, emotion, memory and learning. It is therefore natural to be curious, yet it requires constant nurturing and development. Curiosity creates a motive for explorative behaviour: it propels us to go and 'seek' (Camargo, 2016).

Curiosity expands far beyond the remit of our early years and has high value in business and employment, where it is largely accepted that the:

> truly curious will be increasingly in demand. Employers are looking for people who can do more than follow procedures competently or respond to requests, who have a strong intrinsic desire to learn, solve problems and ask penetrating questions.

> (Leslie, 2014, p.xvi)

Being able to align attributes that industry understands and values is important to employers and collaborators. This substantiates the importance of instilling a culture of curiosity so that students are well adept at demonstrating it. As Leslie discusses, these individuals are 'the ones most likely to make creative connections between different fields, of the kind that lead to new ideas and the ones best suited to working in multi-disciplinary teams' (2014, p.xvi). A pertinent example of a practitioner that challenges creative boundaries (to make connections between seemingly disparate domains) is Japan's leading electronic composer and visual artist, Ryoji Ikeda. His work, *Supersymmetry* is an 'exploration of the intersections between music and visual art through mathematics and quantum mechanics' (Ediriwira, 2015). Using sound, text, visual data and an array of projectors and computers he created an immersive, disorientating installation following his residency at CERN, the European Organisation for Nuclear Research and world's largest particle physics research institute. It is becoming ever more important for artists and creatives to not only challenge their creative domains and boundaries, but to also foster and cultivate a culture of experimentation and curiosity, of intersections and unrelated areas.

While it is possible to gain some understanding of the definition of curiosity, the remit, scope and depth of this attribute is less visible and tangible. Leslie identifies some clear distinctions between varying depths of curiosity and although no scientific metrics are applied, these distinctions provide some contextual positioning on the various degrees by which we may measure curiosity. *Diversive* curiosity 'opens our eyes to the new and undiscovered, encouraging us to seek out new experiences and meet new people' (Leslie, 2014, p.xvi). This can be aligned with our innate desire to seek and explore, with qualities and attributes that, for instance, enable children to be naturally curious by constantly questioning and learning. As we get older our desire to conform diminishes our curiosity. Sir Ken Robinson's talk 'Do schools kill creativity?' (2006) highlights the naturally fearless ability of children and their innate curiosity: 'If they don't know, they'll have a go. They're not frightened of being wrong' (Robinson, 2006). This is underpinned by a natural desire to be inquisitive and curious. The artist and author Erik Wahl also supported this viewpoint of the youthful mindset:

> In our early years, you and I consistently embodied the key traits that drive constant creativity. Curiosity ruled our senses. Enthusiasm ignited our actions. We did not fear what we did not know – instead we thrived on the process of discovery […] and best of all our imaginations were unbound.
>
> (Wahl, 2013, p.19)

But this does not necessarily assume or imply that we are any less curious as we mature. Quite the opposite. There is good argument to support continual development of curiosity well into adulthood. Leslie expands on the notion of the innate curiosity trait by establishing a 'progression' of curiosity, in what he refers to as *epistemic* curiosity – 'what happens when curiosity grows up […]. Epistemic curiosity represents the deepening of a simple seeking of newness into a directed attempt to build understanding' (Leslie, 2014, p.xvi). To put this into context, it might be fair to assume that having a diversive curiosity of languages could, for example, develop into a much deeper and extensive curiosity for culture, identity, ritual, food, communities and society.

Curiosity as a cognitive behaviour and attribute is arguably disparate from the characteristic of being curious. In his book *Curious: Discover the Ingredients to a Fulfilling Life,* Todd Kashdan identifies the characteristics of curious people.

> The first quality is intensity. Highly curious people feel more intense feelings of curiosity, interest and wonder. The more curious among us are open to new experiences, even when familiar and secure ideas and routes are challenged; the second quality is frequency. Highly

curious people feel curious many times in a given day; and the third quality is durability. A curious person's sense of intrigue and desire to explore often endures for lengthier periods of times.

(Kashdan, 2009, p.31).

There is consensus within the field of psychology that there are five key personality traits that define us. This has been derived from analyses of the natural language terms and traits that people use to describe themselves and others. Commonly referred to as the 'Big-Five' or the 'Factor Five Model' the acronym OCEAN lends itself to each one of the recognised personality traits: Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism (John and Srivastava, 1999). Of these traits, 'openness' draws meaningful and relevant links with curiosity and the attribute of being open to new and unfamiliar experiences. Curiosity that leads to creativity is associated with an expansive tendency made up of instincts for exploring, for enjoying novelty and risk (Csikszentmihalyi, 1997, p.11).

With regard to one trait, openness, it is important that students are able to make relevant and meaningful associations, which can positively impact on their work. How could being more open to new and unfamiliar experiences inform the creative process and outcomes? It is important that students are able to examine experiences rather than just living them (Amulya, 2004, p.1). The ability to reflect as well as position themselves within the various facets of being curious as outlined by Kashdan, is vital to their reflective process. A student who engages in reflective practice through, for instance, a learning log or reflective diary/journal, would be able to contextualise and reflect on how they were able to apply curiosity to their respective projects and assignments. Joy Amulya draws links between curiosity and reflection, stating that by 'developing the ability to explore and be curious about our own experience and actions, we suddenly open up the possibilities of purposeful learning – derived not from books or experts, but from our work and our lives' (Amulya, 2004, p.1). It is therefore vital that students can locate the relevance or meaning of their curious encounters and to ensure that they are documenting, recording, analysing and interpreting the 'new' experiences that inform their creative process and project outcomes.

Learning and assessment

Within the context of education, teaching and learning, curiosity is a highly positive and valuable attribute, yet it is seldom signposted or recognised as a specific learning criteria or factor. The *UAL Strategy 2015–22: transformative education for a creative world* by University of the Arts London (UAL) identifies four key strategies 'that aim to ensure that UAL become a world-class University with high levels of student engagement and satisfaction' (UAL Strategy 2015–22 pg. 6).: 'Transformative Education'; 'World-Leading Research and Enterprise'; 'Communication and Collaboration'; 'An Inspirational Environment'. Within the strategy for Transformative Education the plan states that 'we will do this by putting *curiosity*, making, critical questioning and rigour at the heart of our curriculum' (UAL Strategy 2015–22 pg. 7). Fostering and cultivating a culture of curiosity is an important factor that will enable students to exercise their critical synthesis and judgement as well as advancing such skills of observation and artistic re-interpretation. As the strategy suggests, this will be achieved by encouraging teaching methods that develop 'flexible modes of teaching delivery […] and research informed learning to ensure students are thoroughly equipped for their future careers' (UAL Strategy 2015–22 pg. 7).

Established and commonly identified attributes in the strategy include creative facets such as originality, risk taking, non-conformity and playfulness, with curiosity included as one of the embedded required qualities that can support research and develop and facilitate the creative process. Yet by its sheer intangibility and unquantifiability, achieving agreed and aligned perspectives and understanding

of curiosity presents complexities and challenges. For example when a student is required to demonstrate their ability to take informed risks, challenge and move beyond predictable outcomes this is aligned with the criteria of experimentation and therefore we could further assume that curiosity is tacit and therefore a given.

Without clear parameters of what curiosity suggests, it is perhaps too subjective. Furthermore, without any agreed indicators or guidelines, a student's understanding of their level of curiosity may differ from the expectations of the tutor. UAL's 'Taught Undergraduate and Postgraduate Marking Criteria' provides the scaffold for assessment by clearly identifying eight set criteria along with level of achievement indicators and associated grades. It is perhaps surprising that curiosity cannot be found on the 'balance sheet' so far, as a standardised component that is looked for in assessment. There is though good argument for curiosity being embedded within the fixed structure of these respective criteria. It would be fair to locate a level of curiosity in standardised areas of the criteria and arguably in the identified areas of, 'Research'; 'Experimentation'; 'Communication and Presentation'; 'Collaborative and/or Independent Professional Working'.

It is vital that students and educators achieve a shared understanding of the requirements and expectations where factors such as curiosity can be given valuable credit and fair evaluation. It requires educators and students to demonstrate a level of acute judgement, interpretation, license and agreement that would enable both to locate where curiosity can be aligned within learning. For educators, there could be a more easily identifiable way of evaluating the level of curiosity that has contributed to research other than in these assessment criteria.

Curriculum development and briefs
So far as curiosity is concerned, it is an unknown quantity as to what extent courses quantify or measure curiosity, despite students being able to demonstrate curiosity by, for example, experimentation. From a perspective of curriculum development and teaching, project or assignment briefs clearly set out objectives and deliverables. There is further scope to ensure that students fully realise their creative potential not only through accessing 'relevant' research material, but also by fostering and developing curiosity. In this they are also challenging current perceptions and assumptions in their field of knowledge. How far do projects encourage students to explore outside of their field of knowledge, discipline or expertise? This will no doubt vary across creative disciplines and course levels as well as unit positioning within the curriculum.

Students who are able to demonstrate that they are 'well informed, providing well articulated research; demonstrating extensive exploration and skill evident in definition of a research issue' (UAL Taught Postgraduate Marking Criteria, 2011, p.1) may very well be evidencing a tacit and assumed level of curiosity that is embedded in the work and as a result able to achieve the learning outcomes and relevant grade. This is also true of students who can demonstrate that 'risk taking shows a profound and precise understanding of the nature of the field' (UAL Taught Postgraduate Marking Criteria, 2011, p.1). But other than the construct of the marking criteria and the written requirements of learning outcomes and learning aims, there appears to be no clear defined way of encouraging students to explore beyond the boundaries of their core disciplines or subjects.

The curiosity bandwidth
In order to visually present and give some context and dimension to the expanding remit of curiosity and transcending beyond the comfort zone, the 'curiosity bandwidth' is a hypothesis that identifies an area of core interest or expertise (Manu, 2014, p.30). This is founded on a principle of identifying core skills or interests. These reside within the proverbial comfort zone. Students' learning within their discipline may more often than not, reside within the remit of this area so far as research or project

outcomes.

To achieve the full expanse of the curiosity bandwidth, students are encouraged to firstly identify their core research interest, which is tied to the discipline in which they are studying. For example the diagram below demonstrates how a student studying Jewellery Design would research references and sources directly associated within the domain of Jewellery. Research may point to acknowledged theories and processes in the design and production of Jewellery for example. The zone just outside of the core area would require students to look beyond the commonly perceived area not immediately or obviously related to the core interest. In this case, evidencing and demonstrating an interest in the broader remit of culture, ritual or identity as an expanded area of interest. To the student these might be unknowns and uncertainties, yet they could potentially provide them with a broader range of resources and references.

Finally, further extension of this would require students to look at a subject outside their area of interest in which – so far as the UAL Taught Postgraduate Marking Criteria are concerned – could be more associated with 'extensive exploration'. For example, a student might further explore sound or audio, which is outside the immediate area of interest of Jewellery Design, yet opens up the scope of research and creative outcomes.
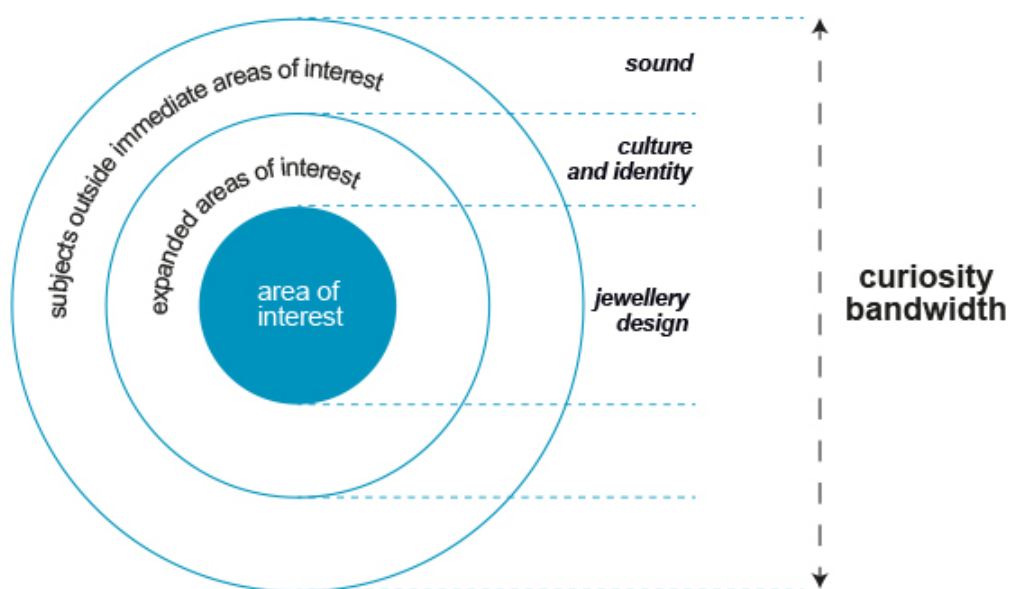

Figure 1: Curiosity bandwidth diagram (Manu, 2017).

It is important to note that this would not be seen as a distraction or reductive, but more of a divergent strategy that sources inspiration, information, data and other resources to converge and feedback into the students' core area of interest.

Curiosity bandwidth in practice – UAL Academic Support
As part of the *Approaching Learning* framework for Academic Support, *Maintaining Curiosity* workshops have been facilitated and conducted in UAL's six colleges, available to students of all levels of study once per academic term. The workshops are available to a broad range of students and any one session has brought together students from Foundation Diploma, undergraduate, postgraduate courses and PhD programmes. The remit of *Maintaining Curiosity* is not discipline specific, so the classes also benefitted from having a variety of disciplines involved, including BA Fine Art, BA Theatre Design, FdA Interior Design, BA Fashion Management, MA Documentary Film and

BA Fashion Photography. These workshops and classes are offered to students under the provision of UAL's Academic Support and the curiosity bandwidth has been an effective framework and resource in the workshops.

In these theoretical and interactive workshops students are introduced to associating curiosity with academic study, through creative practice and alignment with assessment. Students are also presented with existing models of practice and exemplars that contextualise curiosity. Participants go through short exercises that challenge their ability to make advanced and abstract observations and are invited to consider and reflect on areas in their own creative discipline, identifying research or resources in their field of expertise and familiarity. Participants are then introduced to the notion of the curiosity bandwidth, in which they can attempt to think about areas of research and creative practice outside of their comfort zone. Students have commented on how this process has enabled them to broaden the scope of their research but, more interestingly, the general consensus has evidenced that this exercise opened up new ways of thinking about their project.

The workshops also provide students with new creative lenses through which to appreciate, learn from, and encounter disciplines outside their field, as well developing their ability to ask more questions and be more inquisitive. The curiosity bandwidth graph enables them to effectively locate disparate and sometimes new challenging areas of research. Feedback from the workshops has been generally very positive with students being able to identify with a theoretical curiosity bandwidth parameter. As part of the evaluation carried out by Academic Support, a student commented:

> I found the session was really helpful, particularly the discussion about being receptive to the ordinary and being expressive about your curiosities through a reflective journal…I intend to keep a visual journal and try to be more open to the everyday. I will also try and explore further areas of study that are not directly associated to the arts in order to increase my curiosity bandwidth.
>
> (student participant, Manu, 2017)

Beyond the bandwidth – making sense

Where multi-sensory implies activity or experiences that appeal to as many of our senses at once, 'wider-sensory' proposes and asserts an approach to teaching and learning that is more exploratory of a sense or senses outside the remit of a creative discipline or domain. So, for the purposes of this article 'wider-sensory' refers to the ability to widening the approach to senses that could inform creative processes. How could Fashion Photography, for example, explore the modalities of sound or smell to inform creative outcomes? The curiosity bandwidth provides a construct in which to consider the exploration of sensory engagement.

As students have demonstrated, a positive approach, exploring beyond the confines of their discipline, could be further embedded and incorporated as wider-sensory creative provocations in project briefs and assignments to broaden the scope of their research. How might challenging the senses harvest new ideas and innovate models of practice? In their article on the 'Benefits of multi-sensory learning' Ladan Shams and Aaron R. Seitz examine how the human brain has evolved to operate optimally in multi-sensory environments.

> Experience in the world involves constant multi-sensory stimulation. Visual and auditory information are integrated in performing many tasks that involve localizing and tracking moving objects. Therefore, it is likely that the human brain has evolved to develop, learn and operate optimally in multisensory environments.
>
> (Seitz and Shams, 2008).

While the premise is multi-sensory application, this insight supports the assertion that there is plenty of scope to introduce wider-sensory awareness as a means to expanding the gamut of idea-generation and project outcomes in a more exploratory sense, which adopts awareness beyond common perceived domains. It is necessary to enlarge the horizon and to expand consciousness with respect to the cross-sensory interplay in everyday life (Haverkamp, 2013, p.9). Havercamp reiterates that the exploration of wider-sensory application can increase the outcome of ideas: 'Where the more conventional process of design and creative thinking maybe based on the separate and linear trajectory of idea generation and output, this can be found to limit the latter phases of development' (Havercamp, 2013, p.16).

The five sensory systems – visual, auditory, kinesthetic, olfactory and gustatory – are not disparate, yet, they are often perceived as such, which limits and restricts other channels through which we might associate with respective disciplines. For example, the domain of fine art might instinctively link to the visual or kinesthetic modalities. However, many artists, galleries and institutions continue to push boundaries and creative edges, initiating innovative intersections that involve one or more modalities. In 2015 Tate Britain hosted and curated an exhibition which invited visitors to explore art in new ways by involving taste, smell and sound. Tate's Sensorium drew experts in taste, sound, scent and touch to experiment and explore new ways that the public could experience art. A series of sensory interventions were situated in conjunction with art in the gallery space. For example, a haptic device was placed in front of John Latham's Full Stop, using ultrasound to recreate the feeling of rain falling on the hand (David, 2015).

In the *Maintaining Curiosity* workshops, students are introduced to the notion of exploring themes with unrelated domains and senses not immediately associated with those domains. This has proved effective not just in research but also in creative project outcomes. As one student commented:

> I found the references given for the various books and websites really helpful as this gives us the opportunity to further explore our 'curiosities' and to consolidate new ideas touched on in the workshop. I also found the idea of using fragrances in virtual reality to trigger sensations really interesting.
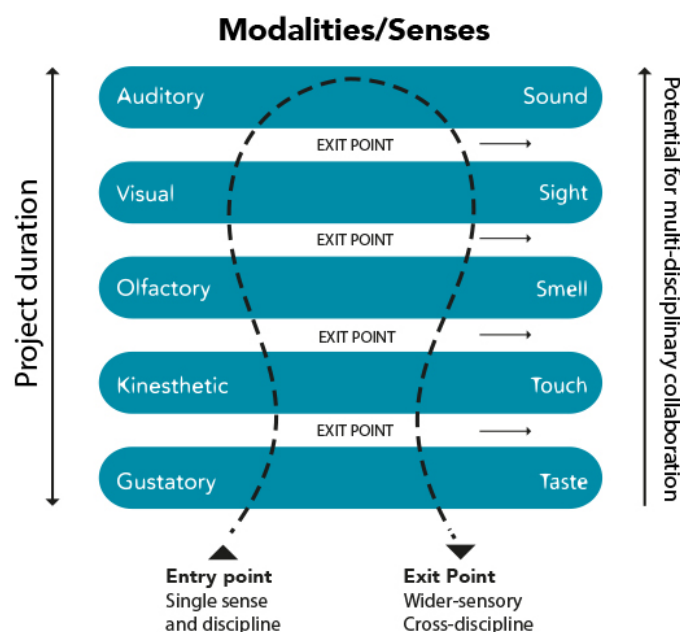
(Student participant, Manu, 2017)

Figure 2: Wider-sensory project scope and idea generation (Manu, 2017).

Figure 2 demonstrates the hypothetical process a student may go through when experiencing wider-sensory engagement. The entry point enables students to access any of the sensory modalities, with the option to explore one or more of the senses. The student would not have to engage in all senses and has exit points between any of the sensory encounters. Another key point is that they are encouraged to collaborate with other students or experts from other disciplines that occupy the domain of an 'exploratory' sense or modality.

A teaching perspective: developing assignments and curriculum innovation
Evidently students are receptive to: firstly, the notion of expanding their creative and research horizons through a notional 'curiosity bandwidth' and secondly, their openness to exploring and fusing unrelated domains. Could there be any value in incorporating elements in assignments that enable students to explore and challenge themselves to use senses beyond their common perceived role? How effective could adopting wider-sensory engagement be as a learning strategy to foster and exercise curiosity?

Within the context of wider-sensory engagement and curiosity, it was important to gain a perspective, attitude and approach from peers on curriculum innovation and development. UAL's Learning and Teaching Day conference in 2017 provided an opportunity to present the hypothesis and share practice and knowledge amongst peers as the theme of the conference focused on 'Cultivating Curiosity'. A workshop entitled 'Wider-sensory engagement to stimulate curiosity in learning' was designed and facilitated, which set out to present a perspective on fostering a culture of curiosity by adopting wider-sensory engagement. The overarching objective was to examine how we can get a shared understanding of strategies that enable students to explore more divergent paths of research. This included outlining an understanding of curiosity within the context of teaching, learning and assessment. It also aimed to ascertain how students could be encouraged to explore beyond their common perceived notions of senses in the respective study disciplines.

The workshop enabled participants to discuss and explore the potential of wider-sensory engagement to stimulate curiosity, and to ascertain how this could inform teaching, learning and curriculum development. The workshop invited colleagues to discuss and debate where curiosity is located in the

curriculum through to assessment. Could curiosity be more measurable or quantifiable? Where could it be located within the set parameters of UAL marking criteria, including areas such as 'Research'; 'Subject Knowledge' or 'Experimentation'? The hypothesis of a curiosity bandwidth was also introduced to the participants to ascertain how or where a concept could fit in the development of project briefs and assignments. Would it be more appropriate to enable students to position themselves in a notional 'curiosity bandwidth' at the beginning of units – or would it be best suited as a reflective exercise before and after assignments?

One of the elements of the workshop was a sensory activity, which set out to implement provocations that encouraged participants to discuss and debate new approaches to adopting wider-sensory elements in briefs to expand curiosity. During the interactive workshop, participants interacted with five 'sensory boxes'. Each box was attributed to one of the five senses and contained a range of sensory stimuli including, abstract sounds projected from digital devices, scents that were emitted from boxes, gustatory interventions that introduced abstract and novel infusions such as pepper infused strawberry chocolate, and a number of textures and visual stimuli. The participants were not restricted to any one sense and could explore and play with one or more of any of the sensory boxes.

The aim of the exercise was to ascertain how educators could use such stimuli as a means to enable and encourage students to explore more divergent paths of research, and also to see how, if at all, the sensory stimuli could be used as part of the creative process, thus enabling students to explore further horizons in their work.

The participants were asked to work individually or in pairs to develop a title, question or directive for a creative brief that encouraged students to think beyond their common perceived notions of a sense. For example to 'Rethink an environment where smell could be adopted to navigate and curate the public around a space?' or 'Re-imagine the intersection of sound and art. You can feel the wallpaper but can you hear it?'.

Participants had a just few minutes to consider a rough outline for a brief, followed by time to devise a learning outcome or learning aim that embedded or included curiosity or wider-sensory engagement within its criteria, for example, 'the ability to explore a range of research that evidences and fosters curiosity'.

Towards the end of the workshop, participants were asked to consider three questions – such as 'How effective could this be as a learning strategy (adopting wider-sensory engagement) to foster and exercise curiosity?' – through a plenary discussion, and participants also captured their thoughts and reflections on another evaluation sheet. Participants commented that the exercise opened research methodologies and invited new connections. Colleagues also commented that the process could be a great way to engage curiosity – and that by simply channelling the senses, students would exercise a sense of curiosity.

Participants were also asked what the potential pitfalls are (i.e. reductive or restrictive). Colleagues commented that if only one sense was used it could be restrictive and that adopting a wider-sensory approach could provide different access points. Colleagues also commented on the cultural relevance and selection of sensory stimuli. One participant commented that one of the gustatory stimuli – a packet of sour Skittles™ sweets might not have the same cultural relevance if, for instance, students from Asia were not familiar with that brand/stimuli. Therefore, teachers would need to be more sensitive to broader cultural reference points – or ensure that students are able to locate sensory or cultural references that they are familiar with.

Participants were also asked to consider how or where such strategies could be implemented (i.e. in course handbooks, briefs, degree shows). There was consensus that this could be outlined in course handbooks and briefs, with further comments outlining that this could also be an effective strategy for peer reflection, sharing practice and processes.

Conclusions

This article set out to present the potential of wider-sensory exploration as a tool to foster curiosity and inform research processes and creative outcomes across creative disciplines in art and design education. This was initiated by findings that supported the rationale to provide tangibility to curiosity. A hypothesis of a curiosity bandwidth was also presented to propose ways to locate and identify the developmental process of curiosity within the research and creative process. The provocation presented itself through a hypothesis of entry and exit points throughout the five modalities that enable students to potentially explore senses as a means of informing their creative process.

The 'Wider-sensory engagement to stimulate curiosity' workshop, which was held at the Learning and Teaching Day in 2017, was an effective environment in which educators shared practice-based and pedagogic approaches to teaching and learning, in the framework of 'curiosity' and wider-sensory engagement. It presented evidence and a case study of innovative models of teaching, located in inter- and cross- disciplinary teaching. The positive and informative response from students and academic staff revealed potential for growth, development and continued discourse.

This article also presented an argument for acknowledging the paradigm of curiosity more tangibly in the classroom, as well as in research outcomes and reflective practice. The long-term aim is to obtain a shared understanding among educators and students of how and where it could potentially be located within formative and summative assessment. In addition, how it could be placed in learning aims and outcomes in project briefs or course handbooks.

In future, it will be progressive to maintain dialogue with course teams and students from a variety of courses at all levels and creative disciplines. The aim would be to further identify elements of evidencing or demonstrating curiosity or wider-sensory engagement on learning outcomes, learning aims and throughout summative and formative assessment irrespective of discipline.

It is fundamental that Higher Education continues to recognise, enable and foster a culture of curiosity, not only within the construct of education but also as a transferrable attribute and quality that is acknowledged by industry, supporting the assertion that the 'truly curious will be increasingly in high demand' (Leslie, 2014, p.xvi). It is even more important that this culture of curiosity can flourish in an environment where wider-sensory exploration facilitates and informs the curiosity in research and project assignments.

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Biography
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