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Thinking through practice: Re-envisioning Kolb through applied design pedagogy

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Abstract

Continued regression of creativity and skills acquisition impacts all levels of teaching and learning, with significant implications towards the quality of Further and Higher Education (FE and HE) provision. Commonly attributed to arts education, creativity and skill should be recognised as human proficiencies and as such, transferable to a wide range of specialisms. Through the lens of applied arts, this research paper explores the potential of embedding experiential learning methodology introducing a paradigm both adaptable and accessible to wider subjects and potentially all levels of education. Despite Kolb's model influencing education practices for forty years through its focus on 'doing' aligned to cognitive activity, critics suggest Kolb focuses on the individual grasping and transforming experience purely through the mind rather than the perceptual system and wider being. An ethnographic study employing mixed methods, including designing a tailored project directed towards the professional applied arts/craft community, stimulated reflective response to both cognitive function and practical process. Employing interpretative phenomenological analysis (IPA), valuable data gathered through reflective diaries, visual documentation and semi-structured interviews exposed the importance of emotive response and sensory perception as key learning processes. These experiences are not well served within Kolb's existing paradigm, nor any level of formal education environment. Drawing on elements of Beard's Holistic Experiential Learning Model (HELM) enabled further demonstration of how emotion, environment, and community contribute to the learning experience. Echoing Sternberg's theory that creative thinking should be considered 'three dimensional', hybridising elements of both Kolb's and Beard's theoretical models informed the evolution of the Experiential Learning Orbicular. This far-reaching paradigm promotes pedagogically holistic and multi-directional application suited to both the FE and HE environments by focusing on real-world learning. This contribution provides methods to support deep experiential learning through applied practice, introducing a pedagogical paradigm that is meaningful, reflective, and well-structured for lifelong learners.

Keywords: metacognition, creative pedagogy, experiential learning, applied knowledge, sensory and emotive response

Introduction – Crisis in creative education

Both the Further and Higher (FE and HE) sectors are in crisis with robust evidence for the ongoing regression of skills in arts and design education, the decline of crafts emphasising long-term trajectory (Cultural Learning Alliance, 2022; James et al., 2019; Pooley & Rowell, 2016). Educators both within and beyond the arts face serious problems concerning the '*how*, *why'*, and '*what'* questions of teaching and learning (Kumar, 2012, 2013; Robinson, 2006, 2010, 2013). Sternberg, Kumar and Robinson all discuss the negative impact of an increasing test culture within schools and colleges where academic hierarchy devalues vocational learning, especially creative subjects. This is decimating both the FE and HE environments who continue experiencing heavy reductions in student numbers studying creative subjects

year on year. The regression in arts and humanities-based subjects within schools over the past decade is undeniable, with a 40% decrease in key stage 4 students taking exams in the arts, design technology and music at GCSE level (Cultural Learning Alliance, 2022; Morby, 2017). The same subjects studied at GCE A Level are equally sobering, despite an increase of 5-15% from 2021 to 2022; in reality, within the past decade numbers have dropped by 44%. These figures help explain the negative impact on FE and HE, not only reduced numbers but regression in creative, technical and practical skills, accentuating the relevance and importance of the research questions within this study.

However, there is hope and opportunity through interdisciplinarity between specialisms, a direct response to how the professional sector is evolving. An increasing trend of collaboration between the arts/social sciences/humanities with health and environment/science and engineering is fostering growth in applied studies; an example being the undergraduate BASc diplomas. Designed to prepare students for contemporary careers and research; teaching, learning and assessment draws upon applied mixed methods informed by creativity and collaboration with stakeholders providing real-world experience. This is not a completely new construct as the foundation of modern education is built on collaboration between the arts, sciences and industry (Lawrence, 2014). There is an element of irony where we see the formation of the Victorian Art School in 1856 indirectly inform the Bauhaus movement then 100 years later, the new Bauhaus initiative introduced through the European Commission informing the principles for modern applied degrees:

> There need be no conflict between knowledge and creativity in our education system. Indeed, the opposite is the case – creativity is founded on deep understanding. Every meaningful creative breakthrough in human history has been made by people with deep expertise, immersing themselves in the practices and problems of the field and finding new ways to see, act or behave (James et al., 2019, p. 7).

The statement above celebrates the historic quality of creativity within Western education systems, whilst conveying widespread concern over the lack of balance in current policy. The Durham Commission on Creativity and Education (2019) included representatives from arts, education, science and industry chronicling how and why creative practice is an essential part of the learning journey. Despite focusing on state education, the Durham report raises concerns applicable to the FE and HE environments (James et al., 2019) and solicits what Sternberg (1996) refers to as '*inert intelligence*' due to a lack of applied learning. These problems suggest an urgent need to investigate the pedagogic/creative philosophies and associated intellectual merits of *creative thinking through practicing craft skills*. This paper analyses the records of practice for eleven professional creatives contributing to the Maker Project research (Sutton, 2019). Commonly disregarded as tacit knowledge unspoken within the realms of creative process (Polanyi, 2009), both the philosophical and physical interactions undertaking the project inform a pedagogical paradigm accessible and transferable to wider subject areas within education.

Methodology

This research project embraces the philosophy of *pragmatism*, as pioneered by Charles Sanders Peirce, William James, and John Dewey (Ayer, 1968). Pragmatist philosophers and crafts-workers share much common ground because their aims are concerned with *adaptation* and *transformation*, be it of ideas or materials; "Pragmatists put themselves in the position of an enquirer adapting himself to and helping to modify a changing world" (Ayer, 1968, pp. 15-16). As both a practitioner and educator with thirty years' experience spanning both sectors, I adopted a dualist positionality whilst consciously maintaining an

apolitical standpoint. Contributing to doctoral research exploring the importance of creativity and skills acquisition within education and society, this paper addresses the following aims and questions.

Aims:

i. To examine how skills employed within the specialist areas of craft and applied design inform both thought and process with potential transferability to other specialist fields of study;

ii. To emphasise the value of experiential learning environments, examining how this can be applied within pedagogic practices.

Questions:

1. How can contemporary craft practice inform teaching and learning?
2. How can skills identified within the Maker Project inform pragmatic pedagogic activities in a transferable and enriching manner?

Designing the Maker Project elicited an ethnographic, heuristic study employing mixed methods including artist profiles, photo/video diaries, reflective journals, semi-structured recorded interviews, and public survey.

Portfolio evidence of the practice research, including the public survey, provides not only a wealth of qualitative and supporting quantitative data but equally, an educational resource accessible to students, educators and policymakers. This resource is available to view at: https://www.makerproject-thinkingthroughpractice.org/.

Table 1

Research Output	**Research Data** (Qualitative[1] / Quantitative[2])	**Relevance / Questions addressed**
Artist profiles	Each profile provided an overview of specialist practice accompanied by a philosophy towards making. This permitted analysis of differences and similarities towards how and what informs craft practice. [1]	Q1
Photo/video Diaries	Visual diaries documented key aspects of the project development. Those makers that were more process led chose to provide detailed stage by stage record of process, instantly acting as a valuable learning resource. Conceptual led practice provided more abstract record of progress. Each evidenced alternative methods of critical thinking informed by practice. [1]	Q1 & Q2
Reflective journals	Within the reflective journals each maker chose their preferred method to document thoughts and responses towards the project. This provided valuable data applying a variety of methods, some choosing detailed description of thoughts and process, others relying on visual descriptors including annotated sketches, diagrams and material samples. [1]	Q1 & Q2
Semi-structured interviews	Semi-structured interviews with each maker evoked deeper reflective response and real-world thinking in respect of this tailored experience, supporting enquiry (Robson, 2002). Individual educational experiences covering a 50-year period provided valuable knowledge exchange for the	

	changing balance between academic and vocational based learning in the UK. [1]	Q1 & Q2
Public survey	Surveying a larger demographic provided wider rhetoric towards personal educational experience and the value of craft skills-based learning. Despite marginality of response from outside the creative sector, there was general consensus towards the importance of craft skills being transferable beyond the arts. [1 & 2]	Q1

Due to the breadth and depth of research data including transcripts of interviews and survey responses, NVivo qualitative data analysis software was used to code key factors including craft philosophy, education experience, and craft practice. These were then subdivided into broader sub-fields for further analysis including ethics and sustainability, material and materiality, formal education (each level), experiential/ancestral and peer learning, fine motor skills and haptic experiences, critical thinking and abstract knowledge.

The phenomenological epistemology, although drawing upon *subjective experience* and principles of individual makers, analyses justified acts from an *objective viewpoint*. As Husserl describes; “We can judge without insight, blindly, as a matter of routine, etc. However, we can also judge with insight – and only by doing so does our judging have objective epistemic value.” (Husserl, cited in Berghofer, 2019).

The participants

Responding to the Crafts Council Report, reaching out to a broader demographic of makers, the Maker Project was advertised nationally through regional crafts networks, the Crafts Council newsletter, and project sponsors Great Northern Events. A sponsored exhibition stand at the 2018 Great Northern Contemporary Craft Fair came with the pre-requisite; as research director, I produce a sample work to promote the project to other exhibiting and visiting makers. This elicited opportunity for both autoethnographic practice-based research whilst also testing the designed project. Foresight in planning potential combinations of applied and digital processes informed project direction. Analysis of this research elicited reflection on prior knowledge and experience (Beard, 2023; Moon, 2000; Schön, 1983), revisiting processes practiced earlier in my maker career. My designer instinct aimed for the piece to remain a functional item of furniture true to its original design, but the craftsperson equally favoured experimenting with alternative materials, processes, and finishes juxtaposed to the original piece. Qualitative data generated from the maker interviews highlighted similar conflicting thoughts throughout the group as how to approach the project, demonstrating the stimulation of divergent thinking (Guilford, 1967) through hands on experience.

The Maker Project application process

Promotion attracted over 80 expressions of interest, with 42 applications across the UK. The digital selection process was conducted with a panel of five respected representatives from the craft community scoring applications against the criteria listed below:

- Consideration towards applying a range of combined making processes, or advanced application of single process executed to a high standard.
- Originality, rationale and/or suitability of proposal.

- Consideration towards scale of the piece in relation to proposed processes and materials.
- Potential for extensively documenting practice via reflective commentary.

Rather than selecting six makers as intended, the larger demographic of textile-based practitioners deemed it necessary to select ten makers, ensuring variety in the range of processes and expertise. Two practitioners submitted a joint application to work collaboratively, providing nine projects to analyse, plus the continued development of my own piece. The balance of specialisms submitting applications was comparable to figures presented within the Craft Council Reports (Pooley & Rowell, 2014, 2016) which highlighted specialisms including hot glass, woodworking and fine metal smithing in heavy decline within education. Adhering to the university research ethics and human participation policy, each appointed maker also signed a research agreement before commencing with the project. The selected maker/research assistants covered a range of specialisms as listed:

- Sharon Adams – Applied Artist
- Sadie Blythin – Jewellery Designer-Maker
- Jeremy Bonner – Leatherworker
- Deborah Carré – Cordwainer (handmade shoemaker)
- Ali Holloway – Weaver and Textile Artist
- Peter Howcroft – Woodworker and Furniture Maker
- Krystyna Pomeroy & Rachael Singleton – Applied Mixed Media and Textile Artists
- Ian Rylatt – Ceramicist
- Tom Sutton – Fine Metalsmith and Furniture Designer-Maker
- Ava Vaughan – Product Designer-Maker

Each maker provided a portfolio of practice demonstrating specialist skills, supported with a proposal on how to approach the brief including synopsis of processes and techniques to be employed. Creating a self-directed project, unadulterated by academic and professional preconceptions, promoted full autonomy simply requiring makers to record their individual enquiry by heuristic method.

The decision to utilise a reclaimed chair frame for the project was determined by the iconic yet modest identity of the C20th tubular frame designed by Bruno Pollak. The silhouette frame offered potential for enquiry and experimentation appropriate to the various disciplines of each selected maker. Nostalgic affinity and modernist form provided a space frame open to reinterpretation to either a completely new concept or sympathetic to the origins of the chair. The range of skills shared amongst the practitioners in combination with philosophy behind the practice delivered a range of approaches and outcomes; from concept jewellery and applied art forms to functional chairs, workbench, and fully working gramophone (see Figure 1).

Employing and building on Kolb's experiential learning cycle [ELC]

The wealth of qualitative data generated from the Maker Project clearly demonstrated each maker applying knowledge through practical skills with informed proficiency. The main challenge was to find a framework which could bring order and categorisation to such a wide array of material. Such frameworks will always be imperfect because the map will never be as rich as the territory, but a degree of clarity was achieved

without sacrificing too much detail by adopting Kolb's experiential learning cycle as a paradigm for analysis. We can *grasp* each maker's account of their creative experiences through dialectically related modes of *Abstract Conceptualisation* [AC] and *Concrete Experience* [CE] then subsequently *transforming experience* via *Reflective Observation* [RO] and *Active Experimentation* [AE] (Kolb & Kolb, 2017). All contributors evidenced engagement across the four modes. From the eleven makers, including my contribution, there was a clear distinction between those who demonstrated a balanced consideration towards all modes; with some favoring AC and AE, and others CE and RO. This difference in approach tended to map across to those creating functional outcomes, retaining existing value or introducing new utilitarian value, and those identified as more conceptually driven. It must be noted, this was not an exclusive factor in all cases.

As Figure 2 illustrates, there was a shared percentage of makers whose philosophy towards the project demonstrates equal consideration towards concept and process (35%) and those where process informs practice (35%). The first demonstrates equal employment of all four modes of Kolb's experiential learning cycle: but for those in which process predominantly informs concept, CE and RO take precedence over AC and AE. Here we see the makers drawing upon underpinned knowledge, prior experience and skill to subsequently stimulate both abstract thought and experimental enquiry; which supports the first question how knowledge and skill teaches, in this case the maker, potential for transferable application. In contrast, those makers where concept informs process (30%) AC and AE instruct CE and RO; demonstrating a more experimental approach to the project. This group employ process and material in a less prescribed method, demonstrating a stronger willingness to take risks whilst similarly promoting transferability of craft skills.

As mentioned, this tendency is not common to all participants. For example; Holloway adopted a conceptual philosophy to the project yet employed considered and skilled practice through the process of

1) Sharon Adams with 'Stack'

2) Sadie Blythin with 'Concept jewellery'

3) Jeremy Bonner with 'Manchester Love seat'

4) Deborah Carré with 'Carré x Cox'

hand weaving underpinned by prior knowledge; for which she maintained full control. Similarly, Adams adopted a conceptual philosophy underpinned by skilled process - actively experimenting with material and process aligned to how an engineer operates. Adams embraced traditional time-tested methods of making, including weaving and pegged jointing, undertaking additional learning via physical workshops and online tutorials to inform further enquiry (Crawford, 2011). For Adams the intellectual gain is linked to the intrinsic value of making (Frayling, 2011; Ingold, 2013; Risatti, 2007) a combination of research and guided instruction stimulating experimental enquiry. This responds to both research questions where we see the maker demonstrating autonomy in applying knowledge and seeking deeper learning (Beard, 2023; Moon, 2000), in this instance through combining different craft practices.

Figure 1 The makers

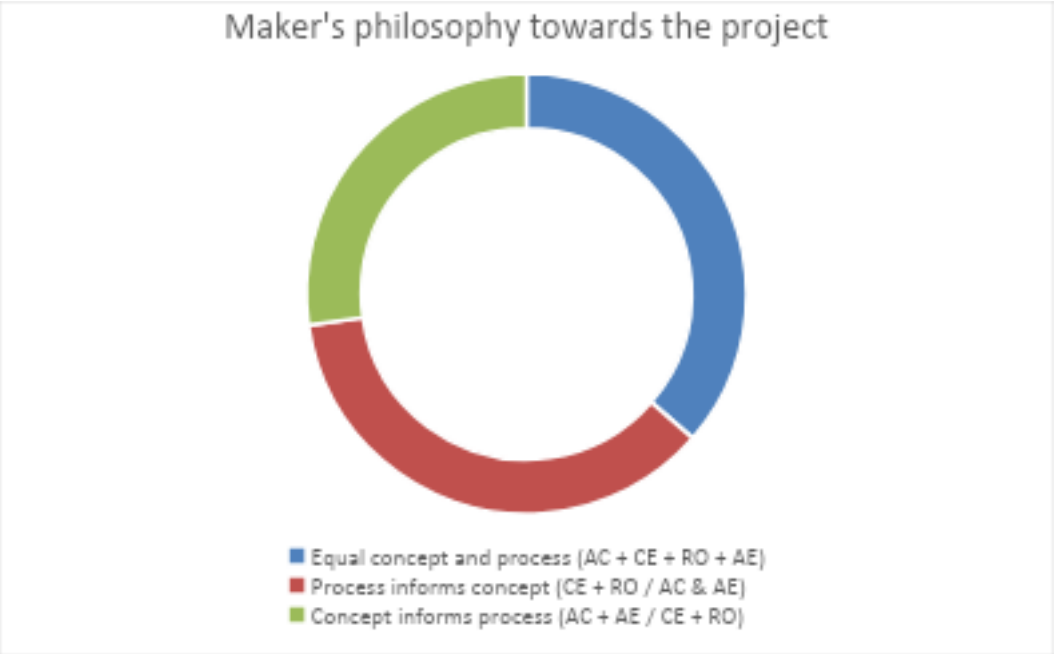

Figure 2 Maker philosophy and demonstration of Kolb experiential learning cycle

According to Beard, this approach allows the maker to become an *architect of experiential learning design*. Their underpinning knowledge and willingness to embrace non-traditional methods stimulate new approaches to problem-solving and creative solutions. “Some designers focus more on solution conjecturing, using generative rather than deductive reasoning in problem analysis, so that problems and solutions co-evolve at the same time” (Beard, 2023, p. 27). Referencing Dewey (1938, p. 90), Beard proclaims that experience-based education is more “strenuous and difficult” but places the student at the center of the learning; opportunity for all levels of education to move towards a more progressive model of teaching, learning, and assessment (Beard, 2023). Adams' approach to the project emulated a real-world experience in which the learner retains full control and responsibility, intellectual gain clearly documented within the journal and accompanying photo/video diary (Sutton, 2019). As suggested, this could be said of all the makers, demonstrated at varying levels and in different manners, to capricious extents. The

qualitative data also required wider considerations towards *reflective experience*, not fully factored into Kolb's ELC. The theoretical model, like all theoretical models, will always require further '*crafty*' elaborations and modifications.

Comparing paradigms – Logic vs holistic

When designing the Maker Project, Kolb's ELC provided a plausible model due to being predominantly directed towards '*doing*' and a recognised model within education for nearly half a century. Providing a simple structure informed by Dewey's '*scientific method*' of discovery, aligned to cognitive thinking, but with a bias towards *logic*. Critics including Beard (2023), Fenwick (2003) and Taylor (1991) suggest this makes the model too formulaic. Kolb is also criticised for focusing on the individual grasping and transforming experience purely through the mind, rather than their entire perceptual system. Fenwick believes this model limits learning to something definitive [*concrete*] as opposed to flowing [*fluid*] or continuous.

Within this research the reflective experiences of the makers draw upon prior experience, memory and environment, evoking emotive responses which could not be captured within Kolb's paradigm. However, Beard's *holistic* experiential learning model [HELM] supported existing research within this topic suggesting how *emotion*, *environment*, and *community* also contribute to the learning experience. Beard builds upon existing simple models including Borton (1970), who prescribes three important functions *sensing* [as experience], *transforming* [as sense making], and *acting* [as engagement in the world]; another holistic educational strategy with three dimensions being the *3H model*. The three Hs' *head*, *hands*, and *heart* have become common rhetoric for advocates of holistic education such as Robinson and Kumar; but Beard acknowledges its limitation of relying on the hand rather than the whole body and perceptual system (Gibson, 1983). Instead, Beard presents the *5H–7M model* which the 5Hs' represent seven modes of experiencing as illustrated in Table 2.

Table 2 Beard's 5H-7M Experiential Learning Model (Beard, 2023)

5 H's	**7 Modes**
Hands	DOING & SENSING as a symbol of the important role of the body for learning the hands are an ideal symbol.
Heart	FEELINGS this represents the part played by emotions in learning.
Head	The THINKING mode includes many capacities such as reflecting, abstract thought, memory, etc.
Home and/or Habitat	BELONGING we live, reside, dwell, and belong, with 'others', in space, and place. In the (1) social [human] world & (2) more-than-human world.
Human	The Human – BEING this concerns the levels of self-awareness, and our sense of identity, beliefs, values, etc.

The seven modes represent ontological facets of our unified being: including cognitive, sensory, emotive, physical, and metaphysical elements of how we learn. Despite being considered too simplistic by some critics, Kolb's ELC provided a workable model for the purpose of this research project, with the valuable

principle of Beard's holistic paradigm supporting the introduction of an additional mode. Within the research project both '*sensory perception*' and '*emotive response*' were recurring elements of the qualitative data. These could certainly be attributed to a mode of '*reflective experience*'. Kolb includes reflective observation within the mode of transforming experience but with a focus on the present, whereas introducing the mode reflective experience provides a more far-reaching division capturing long-term knowledge such as ancestral learning (Schön, 1983). Sternberg's (1996) theory that creative thinking should be considered three-dimensional provided inspiration for this hybrid paradigm which continues to promote multi-directional modelling, echoing the principles of Deleuzian rhizome (Deleuze & Guattari, 2016). In working with a spherical structure, the being (student/researcher/maker) is centrally placed at the core immersed by all learning experience(s) surrounding them.

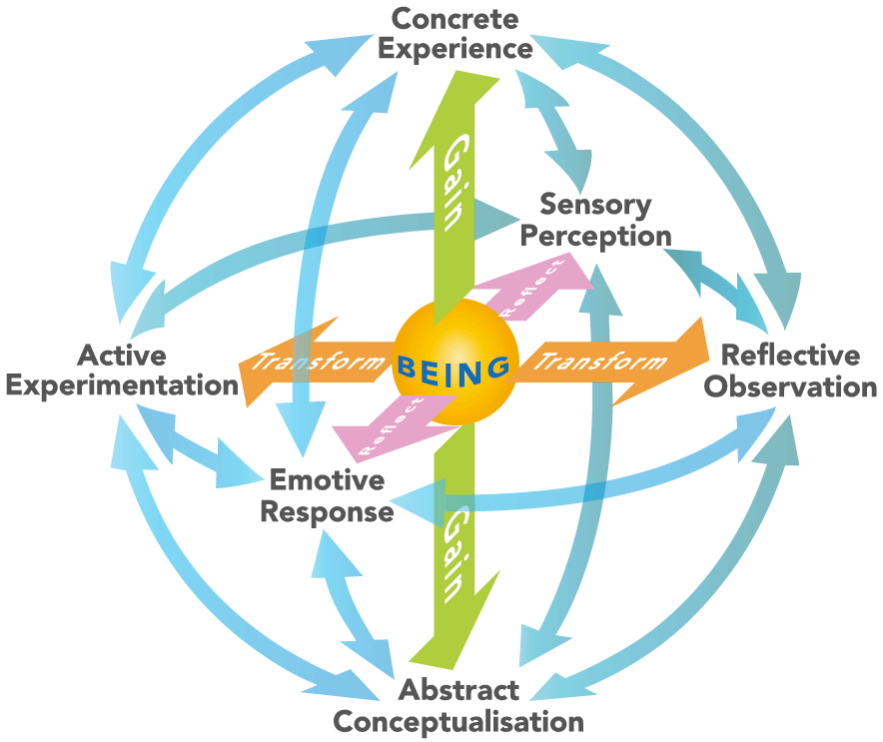

Figure 3 Experiential Learning Orbicular (Sutton, 2023)

Creating a hybridised paradigm provides six dialectical modes - *Grasping Experience: Abstract Conceptualisation* [AC] and *Concrete Experience* [CE]. *Transforming Experience: Active Experimentation* [AE] and *Reflective Observation* [RO]. *Reflecting Experience: Emotive Response* [ER] and *Sensory Perception* [SP]. Still upholding cognitive value by undertaking naturalised epistemological enquiry (Ayer, 1968), it permits both pragmatism towards investigation whilst supporting interpretive phenomenological analysis of the makers contextual and creative contributions (Cohenmiller, 2018; Pietkiewicz et al., 2014; Smith & Osborn, 2008). Despite the belatedness of introducing this revised model, it avoids an idealist analysis of perception and knowledge in relation to the project. Irrespective of one's commitment to any *ontology of the self* at its core, the extra dimensions of description for experience provide a useful compass for how learning actually occurs.

Both Kolb and Beard present valuable and workable paradigms which advocate the importance of experiential learning; with Kolb a global contributor to postgraduate teacher training curricular and Beard an internationally recognised Professor of experiential learning. Both have informed the evolution of the Experiential Learning Orbicular (Sutton, 2023) with Moon (2000) underpinning the value in deeper learning. This model recognises and addresses the limitations associated with its predecessors despite their validity. Kolb's focus on logic presents a simplistic model which although accessible does not accommodate wider values of experiential learning. Beard addresses these omissions, championing holistic experience drawing upon ontology and metaphysics informing learning but, despite its effectiveness, this model could be considered too abstract within mainstream education, lacking the structure of Kolb's model. The ELO paradigm presents a pragmatic alternative which is accessible and well-structured, embracing deeper learning by acknowledging the value of emotive response and sensory perception. These are aligned with but not exclusive to tacit knowledge and ancestral learning, neither of which are recognised in formal education environments, so introducing an inclusive paradigm of this nature is both poignant and valuable.

Reflecting experience – emotive response, and sensory perception informing embodied cognition

Amongst the makers were participants who acted largely upon intuitive association and memory. For some this was an *emotive response* linked to their familiarity with material, process, or the chair frame itself. For Howcroft a strong association with a similar piece of family furniture '*took him back*' to his childhood. Howcroft embraced his prior learning but also related the material to non-learning experiences throughout his life, possibly the result of neuro-trauma and his heightened appreciation to recall lost memories (Bone & Fancourt, 2022). For Howcroft the project became a celebration of lifelong experiences capturing ancestral heritage, childhood and education. He also responded to his professional identity, creating a piece complimenting an earlier work in his career, *reflecting on experience* and issues of core subjectivity, his '*being in the world*' (Heidegger, 2019). Howcroft's contribution epitomises the first aim of this research clearly demonstrating how craft and design skills inform thought and process, despite within his specialist field, demonstrating potential for transferability.

Knowledge of material and process channeled experience towards CE and AC visualising a concept then employing both AE and RO to realise the final outcome. The decision to employ off-the-shelf components as a major part of the work was not based on availability, but his intellectual understanding of the concept, and personal response to the Bauhaus axiom '*form follows function*' (Gropius, 1919). Executed with consideration and proficiency, the crafted element of the dual-purpose Ash workbench and seat demonstrated applied knowledge and mastery of skill gained from lifetime experience, yet remaining understated. Left unable to type or write, the result of his neuro-trauma, Howcroft recorded his process with the assistance of partner Silke Jordan. Collectively they illustrated the journey by combining photographs with tokens from past experiences. Using existing text from magazines, narrative was provided in a similar manner to using off-the-shelf component for the actual piece – an excellent example of deep learning respecting Moon's (2000) learning map, delivering a project that was meaningful, reflective, and well structured. These experiences lend themselves to many levels of adult education beyond creative practice; making sense of learning, working with meaning, employing knowledge, skill, and experience to deliver outcomes, supported with a rich record of enquiry.

Bonner's Manchester Love Seat is another example where *reflective experience* primarily directs enquiry in a manner, suitably captured by the modes of the ELO model (Sutton, 2023). Bonner had a clear concept for the project, reflecting on childhood experience of bicycle building and heartfelt memories of the metal and

wood workshops at school. Reflective memories stimulated positive action, including researching jointing methods used in traditional bicycle frame building. Coincidentally also experiencing neurotrauma, in 2009 post-surgery, Bonner began keeping notebooks for various crafts studied as part of his rehabilitative therapy (Bone & Fancourt, 2022). He is now able to employ applied knowledge and proficiency of skills transferable across a range of materials including leather, wood, and metal (Ingold, 2013; Korn, 2015; Pye, 1995). Attention to detail extended to choice of fixing, such as the nostalgic use of hex bolts similar to those on the bicycle frames of his youth. Undoubtedly there are nostalgic influences within all the maker's projects, to some extent. Although beyond the scope of this paper, much more could be said about the role of memory, ancestral learning, and embodied cognition as pedagogic method (Beard, 2023; Groth, 2016, 2017; Heidegger, 2019). Bonner's detailed retrospective of the project, recording problem-solving and revisions to the original concept revealed him unwittingly making effective use of all six modes of the hybrid ELO. Reflective memory and embodied cognition stimulated creative thinking as a means to resolve challenges and direct continued progression (Beard, 2023; Lucas & Spencer, 2017). These are valuable characteristics responding to both research questions which can inform teaching and learning, are transferable across disciplines and enriching to the learning experience.

Collaboration and co-creation as pedagogic method

Two independent projects demonstrated the value of collaboration within this research (Ravetz, et al., 2014); firstly the journals of Pomeroy and Singleton reveal much about environment, co-creation and emotional response as pedagogic method. With no previous experience of working collaboratively, the pair not only needed to determine a productive method of working but also develop a *common creative language* from which to share and discuss concepts and experiment with processes. Both conducted independent research responding to a mutually agreed theme, using a shared Pinterest board as a foundation for real-time communication. *Emotive response* played an integral part within this collaboration, both makers relying on a high degree of trust. There is notable fluency between both makers throughout each respective journal entry documenting shared thoughts and reflective commentary, each responding to the others experimentation and analysis. Both emulated scientific method, each bringing their own knowledge and skills to the collaboration; Pomeroy confidently employing 3D visual language to explore ideas and Singleton employing applied 2D visual methods, both finding common ground through material exploration. This co-creative enquiry highlights peer learning, elicited by simply allowing the participants freedom to direct their own learning, whilst providing a question/problem/challenge to address. This supports Beard's (2023) theory '*let the learners do the learning*', avoiding prescriptive tasks, in favor of stimulating autonomous teaching and learning methods. Pomeroy and Singleton present an example which is transferable across subjects, both academic and vocational, employing applied problem-solving, applicable to the FE and HE environments and accessible to other levels of education.

Similarly, Rylatt presented a conceptual project yet remaining fully functional, finding himself working across environments as both master and student. Originally an independently directed concept, it subsequently became a wider community project of neighboring creatives, Rylatt lending his knowledge and skill to an extensive range of processes. The ceramic elements alone demonstrate throwing, cut work, hand building, and glaze mixed to his own recipe, yet these become almost understated in the final piece. Accumulated throughout his education, Rylatt's knowledge of material and process working with clay, wood, and metal permitted him to explore the concept with confidence and proficiency of skill. An excellent example of CE underpinning AC, from which Rylatt *transforms experience*: not only actively exploring

material and process via AE but embedding and learning from other practitioners' contributions. Demonstrating leadership, continuous dialogue with other contributors supported RO as he progressed through the project. Rylatt demonstrated a willingness to take risk by bringing an eclectic mix of materials, processes and people together (Nimkulrat, 2010), reflecting on past and current experience, and sensory perception [SP], acquired through years mastering throwing on a potter's wheel. The act of throwing requires the maker to be fully immersed with both material and process, *collectively employing the perceptual system and brain in reflexive and reflective method* (Groth, 2016, 2017). Within Rylatt's detailed reflective commentary he repeatedly references the benefits and potential gained from working with colleagues outside of his own specialism where knowledge exchange becomes common practice. This is reflective of the maker movement which brings members from arts, science and engineering together as a collective learning community (Dufva, 2017). Growing popularity as an educational method within Finland, this highlights the potential value in experiential learning environments employing applied pedagogic practices.

Visual thinking as problem-solving method

Many skills demonstrated within the Maker Project were transferable across disciplines such as stitching techniques and jointing methods. Such processes are not exclusive to the creative arts but commonly used in modern engineering and manufacturing from tent making and garment construction to architectural and civil construction, and biomedical clinical science. The long-term regression of skills-based learning has led to a shortage within the professional sector and visual learning almost totally neglected throughout education. Carré's contribution provided a solid example of SP informing AC transformed via AE, where the maker combines perception and prior experience to physically act on enquiry. A cordwainer, Carré practices a disciplined approach to making; a sequence of 300 individual operations being required to make a pair of shoes (Carré in Sutton, 2019). Both the photo diary and journal evidenced a similar methodical approach to the project, yet documenting the process is predominantly through applying visual method. Underpinned by comprehensive research, Carré makes effective use of *visual thinking* as a method of *problem-solving* (Lucas & Spencer, 2017). Applied processes include stitching samples on leather and pin work on paper, supported by a wealth of sketched idea development and concise written notes. This demonstrates Carré's confidence in allowing image to stimulate reflective memory for future reference. Blythin employed a similar method within her journal but in an expressive manner which retains an abstract quality. Both examples could be interpreted as demonstrating fluid knowledge, where the purpose is not to present didactic instruction for future practice but rather provide markers to stimulate reflective memory, placing value in the experience gained from participating in the project (Beard, 2023; Moon, 2000). The makers are not simply producing products as the result of existing knowledge but rather challenging their own understanding and skill. As Carré explains within her artist statement:

> This project threw me into unknown territory and creative conflict as a craftsman. On the one hand, naturally recalcitrant by nature, I was excited to take the centuries-old techniques and skills of handsewn shoemaking beyond their traditional confines and to throw the usual considerations of fashion, fit and scale to the wind!
>
> On the other hand, as a shoemaker of 20 years standing, I felt something of an interloper - crossing invisible borders into the territory of furniture maker, leather worker, book binder and saddle stitcher – appropriating the trades' specialist tools and techniques to suit my needs. But the more I

> worked on ideas for the chair the clearer it became to me how these skills and techniques needed to be interwoven and interdisciplinary in order to thrive (Carré, cited in Sutton, 2019).

Carré also described how historically many of these specialisms have been taught in isolation within their own guilds, recognising the need to exchange knowledge in order for future generations to appreciate the transferable potential across disciplines, both within and beyond the craft sector.

Figure 4 Page examples from maker project journal (Carré in, Sutton, 2023)

Several makers chose to document their practice through traditional reflective commentary. This provided detailed and comprehensive records of planning, experimentation, analysis, and outcome in a manner which dovetails well with Kolb's ELC. However, each also describes emotive influences stimulating consideration and occasional rethinking towards the aforementioned actions, evidencing *emotive response*, *sensory perceptive*, or *combination of both*. This is incredibly valuable qualitative data, as it allows access to deeper levels of understanding, not merely describing *how* the maker employed decision making but also exploring *why*. This delivers a richer record of thought and processes, as it demonstrates transformative learning. This resonates with Moon's 'map of learning and the representation of learning' which she explains as:

> The map is presented as an attempt to make sense of a broad range of ideas that must logically relate to each other in some manner or other […] reflection on the model will facilitate progress towards greater understanding of a complicated area of human functioning – an area of which educators and learners need to make better sense (Moon, 2000, p. 136).

This is crucial to embodied learning; not only making intellectual *sense*, but engaging all of the *senses*, making more and *better sense* (Wilson, 1998). Different methods and approaches to recording both concept and process became as individual to the maker as their craft practice, commonly referred to as the *maker's mark*. The craftsperson is celebrated not only for demonstration of skill, but the bespoke aesthetic characteristics associated with the *language* and the specific *accents* of process which separate the hand-made from industrial scale manufacturing (Dormer, 2019; Grimshaw, 2014; Korn, 2015). Education can gain much from this by focusing less on academic inflation and more towards transferable and enriching knowledge exchange gained through experiential learning environments that emulate real-world engagement.

Vaughan, the youngest participating maker and recent graduate at the time of the Maker Project, documented experience in the form of a sketchbook journal, likely practised throughout her undergraduate studies. Reflective commentary throughout the journal was concise but comprehensive, supported by

robust primary and secondary research and clear photo documentary of work in progress. A product designer-maker, Vaughan employed both 2D and 3D visual language to explore the concept before deciding on a design directed towards the end user. Likely the result of her prior product design education, this demonstrated visual creative thinking with consideration to wider possibilities (Sato, 2010). Throughout the project, Vaughan established a disciplined approach to *concept* and *process* typically responding to all four dialectical modes of Kolb's ELC but equally demonstrating sensory perception towards material and emotive response to theme. Like Bonner and Rylatt, an extended range of materials and skills were employed, including cabinet making, engineering/lathe work, chemical patination, and fine finishing both wood and metal. All were executed proficiently demonstrating advanced skill and intellectual thinking (Ingold, 2013; Pye, 2015; Sato, 2010). Analysing Vaughan's approach and contribution to the project evoked memories of my own design education. The layout of her sketchbook and her approach to making is not dissimilar to my personal experience of undergraduate study 30 years beforehand. This raised awareness of other parallels in my contribution to the project; citing nostalgia, perceptions from other makers' work drew me towards familiar materials I had repeatedly employed throughout my design education and professional career. Conscious that my piece should combine digital and applied techniques within the making process led me back to laser cutting, which had become common practice within later work. Throughout the breadth of data analysed, both formal and informal educational experiences gained from childhood advising thought and process in adult life became a common phenomenon. Despite informal commonly disregarded as melancholy, effectively these act as reflective triggers with balanced academic and vocational education aiding broad experience. Tacit knowledge, commonplace within craft and engineering but equally wider specialisms, is also informed by these triggers gained from prior education and ancestral learning. This provides argument towards the value of including these experiences as pedagogical method, which the flexibility of the ELO promotes.

Conclusion and future research

In conclusion, through analysing the journals, photo/video diaries and artist statements of each participating maker, alongside self-analysis of my own practice, some *commonalities within both concept and process* present themselves. Here similarities in the methods and approaches between makers which transfer readily across disciplines, potentially beyond the arts, address both research questions. These present valuable opportunities for *knowledge exchange*, applicable to both the FE and HE environments (Nimkulrat, 2010). There is existing evidence to support the transferable value craft practice can employ within wider specialist fields; most commonly seen in engineering and construction, but increasingly specialisms including experimental archaeology, and clinical medical science (Kneebone, 2024). Directly responding to the regression of creative education, Roger Kneebone, Professor of Surgical Education and Engagement Science at Imperial College London, advocates surgical students practising craft processes including pottery and needlework to strengthen fine motor skills (Weaver, 2018). Currently Kneebone is researching medicine, science and engineering as sites of craftsmanship and performance, documenting the lived experience of performing science, engineering and medicine at Imperial College London (Kneebone, 2024). This research echoes the value and poignancy of introducing the Experiential Learning Orbicular which, building on the work of Kolb and Beard, presents a flexible and versatile paradigm suitable for FE and HE but equally adaptable to wider education environments. The reason this model offers transferability across fields is quite simple; this research proves craft skills and creativity are not exclusive to the arts but rather, *human skills* which can be attributed to everyone in some shape or form. Creative/craft skills may manifest themselves in many guises whether medical science, law, engineering and technology,

and so forth; with experts within these fields in essence masters of their craft. Despite the limitation of working with a small research group, thanks to the invaluable contributions of the participants, this comprehensive research project has increased knowledge and understanding for both the *theory* and *practice* of craft. It has provided *deeper knowledge* – though often, deeply saddening knowledge – of the scale of *regression of creativity in all levels of UK education*. Having worked as both a professional designer-maker and educator for over thirty years, I appreciate the intellectual value of *allowing the mind to wander* and the importance of *playing around* within the process of both *designing and making* (Wilson, 1998). The looseness of such activities has of course led to their near total expulsion from our educational institutions. The results of banishing daydreaming, play, and creative performance from education are well documented. Recent estimation of the regression in quality of education spreading to and beyond the arts. A large body of reports articulate the negative impact this is having on society and the professional environment (Hubble & Bolton, 2019; Tambling and Bacon, 2023; The Sutton Trust, 2021).

The success of the Maker Project, and wealth of qualitative data in providing valuable responses to the research aims and questions, justifies the need for similar projects aimed towards wide-ranging subjects in both the FE and HE sectors. Each maker demonstrated an altruistic appreciation for the *value of knowledge* gained from their own and each other's shared experiences. The qualitative data analysed provided a synopsis of each maker's experience, each giving a creative first-hand response to the task, as such, *subjective accounts*. Yet they present graspable and valuable details which would commonly be dismissed or even entirely overlooked by any *objective* observers. This reaffirms the importance in creating opportunities for reflective practice-groups within the education environment (Dewey, 1916). Much would be gained if *community-led peer learning* was enabled, and *collaboration* became common practice. Employing the ELO paradigm for analysing the thoughts and processes of creative professionals has provided a foundation for further enquiry. For example, working with students who have only experienced a digital world (Allen et al., 2014) and predominantly employing digital technology to inform their practice. Directing focus towards using applied skills and analogue technology to stimulate creative thinking, dexterity and application of skill; exploring the adaptability and transferability of experiential learning from this alternative position. Whether classroom, studio, laboratory or workshop, the premise of the ELO lends itself to any learning environment as the fundamentals of experiential learning remain the same, with extended consideration towards reflective experience as pedagogic method (Schön, 1983). The professional makers within this study, although disciplined in the principles of creative practice, demonstrate how influences and personal experiences in early life gained beyond the classroom still contribute to intellectual gain. Most importantly, this intellectual gain, when practised in combination with formal educational environments, elicits lifelong learning and skills development, serving increased value as professional identity evolves.

There is no intention to dismiss or downplay the value of transferable creative craft skills demonstrated within the group, some of which can either directly inform or relate to other specialist educational areas. However, presenting didactic scripture towards particular educational environments would serve only to undermine the principles of experiential learning. The key pedagogic deliverables from this research are collaboration and co-creation, creative thinking and embodied cognition, sensory perception and emotive response, all of which are applicable to the FE and HE environments. Simply presenting students with a question, challenge or task to problem-solve, can evoke these key principles to be explored through hands-on experience across extensive subject areas. Over a period of time, delivering a balanced academic and skills-based education within schools employing the ELO paradigm could foster increased demonstration of creative thinking, penultimately strengthening progressive adult experiential

learning-based education. This is where there needs to be greater communication and collaboration between schools, colleges and universities to ensure a robust education that is long-serving and applicable to a progressive society.

This research places the practical testing for the value of creative thinking at the heart of the study (Guilford, 1967, Lucas & Spencer, 2017; Sternberg, 1996). These findings lay the groundwork for further enquiry and collaborative projects. Positive peer review through dissemination at international conferences, special interest group meetings and conversations with education specialists, provides hope this research will contribute further to the future of this important field of study. This includes further exploration of the intrinsic relationship between *creativity, haptic experiences, embodied cognition and skills acquisition* transferable between specialisms. These strands combine to demonstrate intellectual merits adaptable to a multitude of education environments.

Biography

Dr Tom Sutton is an Associate Teaching Professor at the University of Bolton and early career researcher exploring experiential learning. Trained as a fine metalsmith and furniture designer at the University of Central Lancashire before pursuing a career spanning thirty years working within the creative industries, further and higher education.

References

Allen, J., Andersen, C. U., Bosma, J., Bruno, C., Charlton, J., Chattopadhyay, B., Cramer, F., Cox, G., Fritsch, J., Jackson, R., Lawrie, M., Ludovico, A., Papadopoulos, G., Søren, L. P., Pold, B., Riis, M., Snodgrass, E., Soon, W., Marie, B., & Thomsen, S. (2014). A peer-reviewed journal about post-digital research. https://doi.org/10.7146/aprja.v3i1.116067

Ayer, A. J. (1968). The origins of pragmatism: Studies in the philosophy of Charles Sanders Peirce and William James. The Philosophical Quarterly (1st ed.). Macmillan, 20(78), p.336. https://doi.org/10.2307/2217919

Beard, C. (2023). *Experiential learning design* (1st ed.). Routledge. https://doi.org/10.4324/9781003030867-1

Berghofer, P. (2019). Husserl's noetics – towards a phenomenological epistemology. *Journal of the British Society for Phenomenology, 50*(2), 120–138. https://doi.org/10.1080/00071773.2018.1525798

Bone, J. K. and Fancourt, D. (2022). *Arts, culture & the brain: a literature review and new epidemiological analyses*. Arts Council England.

Borton, T. (1970). *Reach, touch and teach: Student concerns and process education*. McGraw-Hill.

Claypool. D. (2019). *Reimagining the Joseph Johnson collection - Making textiles: History>Identity>Innovation*. Exhibition Bolton Museum and Art Gallery.

CohenMiller, A. S. (2018). Visual arts as a tool for phenomenology. *Forum Qualitative Sozialforschung, 19*(1). https://doi.org/10.17169/fqs-19.1.2912

Crawford, M. (2011). *The case for working with your hands: or why office work is bad for us, and fixing things feels good* (2nd ed.). Penguin Books.

Cultural Learning Alliance. (2022). *Arts GCSE and A Level entries 2022*. Cultural Learning Alliance.

Deleuze, G., & Guattari, F. (2016). *A thousand plateaus* (B. Massumi, Ed.) Bloomsbury.

Dewey, J. (1916). *Democracy and education*. Champaign, Ill. Project.

Dewey, J. (1938). *Experience & education*. Touchstone Simon & Schuster.

Dormer, P. (2019). *The culture of craft* (2nd ed.) (P. Dormer, Ed.). Manchester University Press.

Dufva, T. (2017). Maker movement creating knowledge through basic intention. *Techne Series - Research in Sloyd Education and Craft Science A, 24*(2), 129–141. https://journals.oslomet.no/index.php/techneA/article/view/1910

Fenwick, T. J. (2003). *Learning through experience: Troubling orthodoxies and intersecting questions*. Kriegar Publishing Company.

Frayling, C. (2011). *On craftsmanship*. Oberon Books.

Gauntlett, D., (2013). *Making is connecting: The social meaning of creativity, from DIY and knitting to YouTube and Web 2.0* (1st ed.). Polity.

Gibson, J. J. (1983). *The senses considered as perceptual systems* (2nd ed.). Greenwood.

Gray, C., &; Malins, J. (2004). *Visualising research: A guide to the research process in art and design* (1st ed.). Ashgate Publishing Ltd.

Grimshaw, D. (2014). *The language of process*. MMU Archives and Special Collections catalogue, January 2014.

Gropius. W. (1919). *Bauhaus manifesto program & statement* (testimony of Walter Gropius).

Groth, C. (2017). *Making sense through hands - design and craft practice analysed as embodied cognition* [PhD thesis]. Aalto University Publications. https://doi.org/10.7577/formakademisk.1481

Groth, C. (2016). Design and craft thinking analysed as embodied cognition, FormAkademisk - forskningstidsskrift for design og designdidaktikk, 9(1). https://doi.org/10.7577/formakademisk.1481

Guilford, J. P. (1967). *The nature of human intelligence*. McGraw-Hill Book Company.

Heidegger, M. (2019). *Being and time* (3rd ed.). J. MacQuarrie and E. S. Robinson (Eds.). Martino Fine Books. (Original work published 1945)

Hubble, S., & Bolton, P. (2019). The post-18 education review (the Augar Review) recommendations, Number, 8577.

Ingold, T., (2013). *Making* (1st ed.). Routledge. https://doi.org/10.4324/9780203559055

James, Simon. J., Houston, A., Newton, L., Daniels, S., Morgan, N., Cohu, W., Ruck, A., & Lucas, B. (2019). *Durham Commission on Creativity and Education*. Arts Council England and Durham University. https://www.dur.ac.uk/resources/creativitycommission/DurhamReport.pdf

Kneebone, R. (2024). About. *Roger Kneebone*. https://www.rogerkneebone.co.uk/about

Kolb, A., & Kolb, D. (2017). *The experiential educator: Principles and practices of experiential learning*. Experience Based Learning Systems.

Korn, P. (2015). *Why we make things and why it matters*. Vintage.

Kumar, S. (2012). *Holistic education: Learning with your whole being*. The Kadoorie Institute and Schumacher College. Hong Kong. https://www.youtube.com/watch?v=nWo1k4jrbgk

Kumar, S. (2013). Education with hands, hearts and heads. TEDx Talks. https://www.youtube.com/watch?v=VAz0bOtfVfE

Lawrence, R. (2014). The evolution of the Victorian art school. *Journal of Architecture, 19*(1), 81-107. https://doi.org/10.1080/13602365.2014.884842

Lucas, B., & Spencer, E. (2017). *Teaching creative thinking: Developing learners who generate ideas and can think critically*. Crown House Publishing.

Moon, J. (2000). *Reflection in learning and professional development: Theory and practice* (1st ed.). Routledge.

Morby, A. (2017, August 24). GCSE results show 'alarming' drop in students taking art and design. *Dezeen*. https://www.dezeen.com/2017/08/24/gcse-results-show-alarming-drop-in-students-taking-art-design-uk-news

Nimkulrat, N. (2010). Material inspiration: from practice-led research to craft art education. *Intellect, Craft & Research, 1*(1), 63–84. https://doi.org/10.1386/crre.1.63_1

Pietkiewicz, D. I., Keegan, R., & Smith, J. A. (2014). A practical guide to using interpretative phenomenological analysis in qualitative research psychology. *Czasopismo Psychologiczne Psychological Journal, 20*(1). https://doi.org/10.14691/CPPJ.20.1.7

Polanyi, M. (2009). *The tacit dimension*. (2nd ed.). (A. Sen, Ed.) University of Chicago Press. (Original work published 1966).

Pooley, E., & Rowell, A. (2016). *Studying craft 16: trends in education and training*. Updated from 2014. Crafts Council, TBR, Pomegranate.

Pooley, E., & Rowell, A. (2014). *Studying craft: trends in education and training*. Crafts Council, TBR, Pomegranate.

Pye, D. (2015). *The nature and art of workmanship* (3rd ed.). Bloomsbury. (Original work published 1968).

Ravetz, A., Kettle, A., & Felcey, H., (2014). *Collaboration through craft* (1st ed.). Bloomsbury Publishing.

Risatti, H. (2007). *A theory of craft* (1st ed). University of North Carolina.

Robinson, K. (2006, February). *Do schools kill creativity?* TED Talks: Education. https://www.ted.com/talks/sir_ken_robinson_do_schools_kill_creativity

Robinson, K. (2010). *Bring on the learning revolution*. TED Talks: Education. https://www.ted.com/talks/sir_ken_robinson_bring_on_the_learning_revolution

Robinson, K. (2013, April). *How to escape education's Death Valley*. TED Talks: Education. https://www.ted.com/talks/sir_ken_robinson_how_to_escape_education_s_death_valley

Robson, C. (2002). *Real world research* (2nd ed.). Blackwell.

Sato, M. (2010). *An investigation into the relationship between design thinking and skilled knowledge and craft education* [PhD thesis]. Roehampton University, UK.

Schön, D. A. (1983). *Educating the reflective practitioner* (1st ed.). Jossey-Bass A Wiley Imprint.

Smith, J. A., & Osborn, M. (2008). Interpretative phenomenological analysis. In G. M. Brakwell (Ed.), *Doing Social Psychology Research*, pp.229–254. https://doi.org/10.1002/9780470776278.ch10

Sternberg, R. J. (1996). *Successful intelligence: how practical and creative intelligence determine success in life* (1st ed.). Simon & Schuster.

Sutton, T. (2019) *The Maker Project – Thinking through practice*. https://www.makerproject-thinkingthroughpractice.org

Sutton T. (2023). *The Maker Project: Thinking through practice – analysing the importance of creativity and skill within education and society* [PhD thesis]. University of Bolton.

Tambling, P., & Bacon, S. (2023). *The arts in schools: Foundations for the fut*ure. Calouste Gulbenkian Foundation. A New Direction Publication.

Taylor, H. (1991). The systematic training model: Corn circles in search of a spaceship? *Journal of the Association for Management Education and Development, 22*(4), 258-278. https://doi.org/10.1177/135050769102200401

The Sutton Trust. (2021). *Universities and social mobility: Data explorer*. https://www.suttontrust.com/universities-and-social-mobility-data-explorer-rankings/

Weaver, M. (2018, October 30). Medical students "raised on screens lack skills for surgery." *The Guardian*. https://www.theguardian.com/society/2018/oct/30/medical-students-raised-on-screens-lack-skills-for-surgery

Wilson, F. R. (1998). *The hand: how it shapes the brain, language and human culture* (1st ed.). Vintage.