13. Creativity 2.0: new approaches to creative economy work and education in the creative industries

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INTRODUCTION

Creativity research has repeatedly highlighted a distinction between two types of creative thinking process: divergent and convergent, adapters and innovators, left brain and right brain. This relates to a duality in the definition of *creativity*, poised between "novelty" and "value", and to different "stages" in the creative thinking process. In popular culture, we have tended to highlight original thinking and novelty over adaptive thinking and value, not least because the former appears to be more elusive and mysterious. Creativity is also, according to Boden (1990) and other creativity theorists, the element that distinguishes humans from machines, connected to the idea of human consciousness.

Yet adaptive thinking has an important part to play in creativity, especially in the creative industries themselves. Here, attention has shifted from the content of cultural products to the context of cultural consumption. Digital platforms have transformed the nature of cultural consumption, allowing more agency to consumers to "co-create" meaning and value. These technologies were identified as *Web 2.0*, a term describing apps and platforms that changed digital media from a broadcast model to a two-way flow based on collaboration and exchange. In this chapter, we consider a *Creativity 2.0* model of networked creativity adapted to our connected, digital culture. This model places greater emphasis on the latter stages in the creative process, on adaptation and user experience, rather than invention and product innovation. This more expansive definition of creativity also fits with this book's shift from *creative industries* to *creative economy* as the locus of creative work.

CREATIVITY AND THE CREATIVE ECONOMY

Creativity has long been recognised as a dualistic, multi-faceted entity that encompasses different ways of thinking (process), different combinations of groups and individuals (people) and different outcomes (product). Much of the critical literature on creativity has had a polemical edge, aimed at correcting popular assumptions about creativity as the preserve of gifted individuals, special talents and behaviours, a specialist task or "stage" in thinking, a pursuit of "mere novelty". There is broad acceptance that creativity requires multiple types of thinking (Gardner, 1984; Sternberg, 1988), a combination of different skills and talents (Kirton, 1984; Weisberg, 2010), a collaboration across creative teams, systems and organisations (Amabile, 1988; Csikszentmihalyi, 1988; Sawyer, 2006), and an outcome that is not only novel, but also valuable (Boden, 1994, pp. 75–9).

Despite this emphasis on a "sociocultural" paradigm of creativity (Sawyer, 2006), old hierarchies persist. Creative systems and teams still revolve around talented individuals. Theories of the creative process still privilege the moment of ideation over the painstaking processes of preparation and verification that precede and follow the flash of "illumination". Even attempts to de-essentialise and demystify creativity still reinforce a distinction between *creative* and *non-creative* roles (Glăveanu and Lubart, 2014).

This chapter argues that in today's creative economy it has become increasingly difficult to separate the creative idea from the expression and delivery of that idea, and this necessarily involves a *supporting cast* of co-workers and a suite of skills, techniques and technologies that are beyond the scope of the creative individual, no matter how talented. This mutual dependency is heightened by the increasing interdependence between specialised technologies of production and distribution in the creative industries.

Historically, the supporting cast has been positioned at a secondary order of importance and abilities beyond the creative individual. Administrative or "back-office" workers in the media and entertainment sectors are classified according to standard industrial and occupational codes (SIC and SOC[2] respectively) as pursuing a non-creative job in a creative industry. Within the organisation, this role separation has been entrenched by cultural and organisational hierarchies and divisions, which often result in mutual hostility and organisational dysfunction. Beyond the single organisation, the non-creative work of adapting, marketing and delivering creative products has been distributed unevenly along the value chain, which in turn reflects a fundamental divide between *content creators* and *gatekeepers* or *intermediaries* (Hirsch, 1972). Again, such divisions have been accompanied by mutual suspicion, if not outright hostility.

With the transformative and disruptive effects of digital technology on media and creative industries over the past 20 years, familiar divisions between production and consumption, between creation and mediation, and between art and technology, have become increasingly tenuous. The line between creative and non-creative roles is blurred also by the emergence of an *experience economy*, in which consumption and exchange around creative content are often as important – and creative – as the content itself. These processes of exchange and interaction are increasingly likely to be mediated through digital technologies.

As we transition from the always unsatisfactory definition of creative industries to the new rhetoric of creative economy, we may at the same time need to rethink what we mean by creativity. A creative economy is no longer restricted to certain "cultural", "media", "entertainment" or "audio-visual" sub-sectors such as music, TV, film or performing arts. Instead, we can recognise a much wider range of organisations and sectors that are loosely based on communicating meaning and value, from museums and theatres, to advertising, design, events management, user experience design or tourism. Technology companies play a central role in the experience economy, both in terms of experience design (using algorithms and consumer data to target individual preferences) and in terms of experience delivery (providing an extended and immersive experience beyond the core product) (Hesmondhalgh and Meier, 2018).

The interdependence between the art of production and the technologies of consumption in the creative economy forms the background to this chapter. First, the chapter will review the relationship between art and technology, based on the notion of technologies providing *affordances* for creativity. Then, the chapter will consider the implications of this digitally mediated creative economy for skills and training.

CREATIVITY, TECHNOLOGY AND AFFORDANCES

In today's creative economy, creativity has come to encompass more than good ideas. The packaging and experience of the idea are at least as valuable as the raw content. In this experience economy, digital technology plays a crucial role in corralling, retaining and commodifying consumer attention, to the point where it is difficult to separate products and services from the platforms and experiential frameworks that mediate them. This shift in values is reflected in the economic structure of the creative and media industries. Consumers expect cultural content to be free, yet they will pay for the technologies, platforms and channels that make this free content accessible, shareable, relevant or personal to them. Consequently, while content producers are competing in a saturated market with low margins, weak bargaining positions with consumers and intermediaries, and low to zero wages, the digital platforms that package this

content (giving it away for free, but commodifying the data of those who consume it) have grown into some of the richest, fastest-growing companies on the planet. The Big Four of Apple, Facebook, Google and Amazon have, at various points, either approached or surpassed a market capitalisation of a trillion dollars and increasingly dominate the "creative" industries of music, publishing, film, TV and news. In China, the dominance of Tencent, Alibaba, Baidu and Sina-Weibo, along with businesses they own wholly or in part such as NetEase, iQiyi and WeChat, tells a similar story. Ideas are cheap, but the packaging and sharing of other people's ideas, identities and consumption habits is big business.

This restructuring of the creative economy necessitates a reassessment of both the nature of creativity itself, and the skills needed to succeed in a digitally mediated creative economy. For those in the business of creating content, the challenge is how to take control of the ways in which their content is delivered and experienced. This in return requires a re-orienting of what it means to be an artist in the twenty-first century. Musicians are musical entrepreneurs, authors are bloggers and self-publicists, and film-makers must think about the consumers sitting behind screens or watching through 3-D glasses, not just about stories and characters. Of course, creative industries have always combined creativity with business acumen. But the reliance on digital mediation requires something more, and changes the definition of creativity to encompass the ways in which ideas are adapted, shared and used. What was previously a secondary task, something entrusted to agents or marketers, has now become integral to story-telling. Digital technologists are no longer simply tasked with the administration of digital assets (Bennett, 2020) and must be taken seriously as part of the creative workforce. Digital platforms empower fans, not only to re-create or co-create their own version of a given piece of content (Jenkins et al., 2013), but also to enrich the value of the original work (Baym, 1998). Managing these information flows between author and reader, through digital platforms, has become integral to the creative value of cultural and media products.

The changing role of the artist is reflected in changing job descriptions for "creative" work. In the United Kingdom (UK), a recent report examined 35 million job advertisements and found a strong correlation between creative and digital skills. These *createch* skills were often associated with particular "creative" software, such as Adobe Photoshop. Of the occupations most reliant on createch skills, graphic design and photography unsurprisingly have creative and digital skills embedded within them; but createch skills were also found to be in demand among artists, art directors and producers (Bakhshi et al., 2019).

The idea that creative processes and products in the creative industries are mediated through technology is nothing new. Creative industries are the result of applying technologies of production and consumption to cultural artefacts,

thereby destroying what Walter Benjamin (2008) called the *aura* of the art object and making the work of art available for mass consumption. According to the Frankfurt School, the process of mechanical reproduction is one of commodification, replacing authentic cultural experiences with a false promise. A similar scepticism surrounds today's mediated cultural products; however, it is based less on nostalgia for an unmediated, authentic product, and more on the dominant role of technology companies that have secured a monopoly on consumer data and consumer experiences (Keen, 2008; Lanier, 2010).

Despite this critique, it is clear that technology also plays an enabling role in cultural production. In the music industry, commentators including Simon Frith (1986) and Keith Negus (1992, p. 86) have noted that technology has made possible new forms of creativity and new styles of music. The opposition between purists and technologists in this sense is artificial. Yet, doubts remain about the limits of technology in the cultural sphere. Technology can *enable* human creativity, but could technology ever *replace* it? This is the question posed by Byron's daughter Lady Lovelace in 1842, known as the *Lovelace question*: Could a machine ever replicate human creativity, or is it limited to performing only those functions programmed into it by its (human) creators (Boden, 1990)?

One answer to this question is the notion of *affordances* (Glăveanu, 2012). An affordance can refer to any resource that makes an action possible, including, for example, finance, technologies, networks or human resources. On the other hand, an affordance can also restrict or channel action within a narrow framework of possibilities. So, on the one hand, creative technologies can enable or "liberate" creativity (Zagalo and Branco, 2015); however, on the other hand, they might also work against it. According to Jared Lanier's (2010) manifesto, technology, especially social media, removes agency and control, favouring "flatness in cultural expression" (p. 120).

Behind this discussion is a question about the relationship between freedom and constraint in the creative process. Contrary to the assumption that creativity equates to absolute freedom of expression, which allows individual creativity to be "unleashed", a majority of creativity theorists argue that creativity depends upon the constraints imposed by expertise, genre, technique or tradition. For Weisberg (2010), domain-specific expertise gives shape and direction to individual creativity. Csikszentmihalyi (1988) describes individual creativity framed by a creative system that comprises both a domain (a production culture) and a field (institutional channels and relationships). Margaret Boden (1994) likewise describes creativity taking place within a bounded conceptual space (pp. 79–84), testing and stretching the boundaries to eventual breaking point. The transformative power of creativity, according to Boden (1994), results not from "thinking outside the box", but thinking at the extreme inside edges of the box. Applying these notions of freedom and constraint to

creativity and technology, the affordance of digital technology both enables and constrains (Moeran, 2014, pp. 41–2). This is not so much a contradiction, but more of a paradox: constraints enable creativity.

Furthermore, while affordances for creativity exist, they must also be perceived, recognised and utilised (Glăveanu, 2012). This requires some broader *meta-level awareness*, understanding what the affordance (technology) can and cannot enable, and turning it to account. For an example of how this might work in practice, we might consider experimental attempts to answer the Lovelace question using technology to replicate or replace human creativity. Hennig-Thurau and Houston (2019) describe two such experiments (pp. 306–10). The first was an attempt to compose a hit musical using algorithms to generate the plot and the music (the book and lyrics were man-made), resulting in the musical theatre show *Beyond the Fence*, which premiered at London's Arts Theatre in 2016. The second was an attempt over several years in the early 2000s by composer David Cope to use computing power to input the work of great composers, from Bach to Mozart, into an algorithm that then reproduced plausible versions of similar compositions, potentially on a massive scale.

Hennig-Thurau and Houston (2019) write persuasively on the power of algorithms to shape decision-making in the creative industries, rather than relying on mere "intuition" to green-light a creative project. Today's digital technologies are capable of analysing vast amounts of consumer data to predict consumer tastes, and streaming services such as Netflix and Spotify have, according to Hennig-Thurau and Houston, successfully incorporated this data into their programming decisions. However, when technology is used not only to predict consumer taste but also to create the artistic product, the results are more mixed. *Beyond the Fence* was not a hit with audiences or critics and had a limited run. One reviewer described the work as "bland, inoffensive, and pleasant as a warm milky drink" (Gardner, 2016, para. 1) as well as "risibly stereotypical" (Gardner, 2016, para. 5). Cope (1991) has continued to refine his project of computer-generated music. But he too acknowledges its limitations. The computer is incapable of making decisions or of recognising the value of its own output. Cope himself has the task of selecting and refining this output. In the end, as Lovelace predicted, the algorithm remains a tool, just as a keyboard or a guitar pedal are tools, enablers rather than surrogates. The key difference may be that Cope positions himself as an affordance for the composition algorithm rather than the other way around.

Hennig-Thurau and Houston (2019) are interested in the application of data to shape creative decisions. Yet, in this instance, while the individual decisions (Which note, in which order? Which plot element?) are plausible, the algorithmic process lacks a wider view of the composition process that allows artists not only to generate plots, but also to tell a story. As Cope (1991) discovered,

the machine is not capable of recognising the quality of its own ideas, of discriminating between a good or bad innovation. We might call this missing ingredient emotional intelligence or self-awareness. With the right data input, an algorithm can generate endless variations on that input, resulting in plausible replicas of a Bach chorale or generic plots for a musical. But the machine is not (yet) capable of selecting which promising ideas are worth pursuing and stringing them together. In terms of creativity, the algorithm is better at idea generation than idea recognition. In the iterative loop of the creative process, this is a severe limitation because idea recognition is necessary to generate the next idea and build a sequence of ideas into a coherent narrative.

If technology is an affordance, it provides some capabilities that might accelerate or enhance a creative process; it might also, as Lanier (2010) suggests, be reductive, "flattening" human creativity. In creativity terms, affordances might result in what Boden (1990) terms *mere novelty* – and novelty without value (a subjective judgement) is not the same thing as creativity. Human intelligence is necessary to connect innovative elements into valuable outcomes and to organise the different stages or components of creativity into a coherent whole. Creative thinking and digital tools (including the "algorithmic creativity" explored by Cope) can be seen as complementary, but they need this meta-level cognitive connection to turn affordances into actions. This becomes even more important in popular culture because fans' responses and fan creativity can, with the right digital architecture and the complicity of the copyright owner, be orchestrated and integrated to add value to "original" work. Digital fandom might therefore be classified as another affordance for creativity, provided that it can be integrated and recognised by the original creator.

CREATIVE COMPETENCES: THE PROBLEM OF SPECIALISATION

Whereas affordances describe externalities that frame the creative process, *competences* describe capabilities within creative individuals or teams. Like external affordances, internal competences can both constrain or enable action. We know that creative individuals and creative teams must encompass a range of different thinking styles and cognitive processes, from divergent to convergent, from diligent perseverance to spontaneous risk-taking, from rational to intuitive. In the first part of this chapter, this multiplicity was linked to the increasing reliance on multi-talented teams to develop and deliver creative content in the digital creative economy. As with affordances, competences are not in themselves intrinsically "creative" and the elements that comprise creative cognition are less important than the connections that join them. This in

turn requires some meta-level awareness or governance that can discriminate and recalibrate between often opposing tendencies.

There have been numerous attempts to categorise different cognitive elements within creative teams, or within teams in general. Belbin's (1993) *team roles* is one of the more commonly applied frameworks; De Bono's *Six thinking hats* is another. One limitation of these taxonomies is that first they can appear to privilege one type of thinking over another (Is the "plant" more creative than the "completer-finisher"?). Another weakness is that they can trap individuals in rather stereotypical, limited roles that do not allow them to change, develop or rediscover themselves (McCrimmon, 1995). In a creative team especially, such fixity might be particularly deadening.

The tendency to type-cast individuals in teams is particularly pronounced in the so-called creative industries themselves. Without wanting to dwell too long on the definition, creative industries deploy human imagination and intelligence to devise *symbolic goods*: products or services whose primary purpose and value lie in their ability to communicate meaning. For example, film, music and advertising all fit this definition. These industries are usually project-based, assembling creative teams for the duration of a project to contribute specialist skills for a limited period of time. At the end of the project, the team dissolves, only to reassemble in new configurations around another project. Team members are valued for their specialist contribution, and their ability to pitch for work depends upon freelance individuals and specialist firms highlighting their talents as distinctive, scarce or even unique. Consequently, the creative industries, particularly those involved in the generation of content as opposed to exploitation or delivery, are typically dominated by small, temporary project-based enterprises collaborating in networks. Depending on the sector, most "organisations" in the creative industries number fewer than 10 employees, with other individuals joining ad hoc according to the demands of the project in hand. The characteristic mode of production is post-Fordist *just in time* delivery by networks of specialists collaborating in temporary teams.

With the growing reliance on digital technologies for both the dissemination and production of cultural products, any creative team in the creative industries is likely to include its share of technology specialists alongside creative specialists. From music technology to computer-generated imagery to computer-aided design, specialist technologies of production in the music, film or design industries require specialist talents to operate them. Creative technologists thus form a significant proportion of the network of specialists that lie behind the creative team.

A weakness in this project ecology is the absence of any system of governance that can ensure continuity, allow for reflection and self-awareness or gather and archive collective memory (Grabher, 2004). In the absence of any permanent core or centralising hub, what is to stop these teams of specialists

collapsing into pointless repetition, or self-destructive and self-defeating behaviours? And what is there to ensure that such dissimilar, even opposing, mindsets can collaborate effectively?

In reality, people working in the creative industries are used to collaborating and adapting their behaviours to accommodate differences of opinion, ideology or attitude. Against the risk of over-specialisation and fragmentation, there is an opposing tendency to self-assess, adapt and self-reflect. Contrary to the stereotype of "difficult" creative individuals (who surely do exist!) anybody seeking a creative career quickly learns to sacrifice individual goals and preferences to the needs of the shared project. This in turn requires a degree of self-awareness, self-restraint and adaptability. While individuals and micro-businesses may emphasise competitive differences when pitching for contracts and projects, they rely upon cooperative abilities to deliver them.

When assessing the competences required for a creative team, it is possible to make a case for any number of specialist attributes or talents. As soon as these are compiled into a list, the apparent contradictions and tensions between these different competences become glaringly obvious. Perhaps more important than any technical or artistic ability, a key attribute of any member of the creative team is their awareness of their own and others' abilities, of how these can dovetail together and of how individual competences mesh with the overall aims of the project. This "meta-awareness" reflects the ambidextrous, "bisociative" nature of creativity, described by psychologists as "tolerance for contradictions" (Barron, 1958), "constructive, synthesizing, unifying and integrative" (Maslow, 1987, p. 162) or "multifaceted" (Sternberg, 1988), and by the novelist F. Scott Fitzgerald in his 1936 essay "The Crack-up" as "the ability to hold two opposed ideas in the mind at the same time, and still retain the ability to function" (Fitzgerald, 2005, p. 139).

If creative cognition requires an ability to bridge different competences, attitudes and thinking styles, how is this to be cultivated through education? Creative skills are individualised and specialised; the same could be said of technological skills. The next section considers how this risk of over-specialisation and talent "silos" can be addressed in the curriculum.

TECHNOLOGY AND CREATIVITY: THE EDUCATIONAL CHALLENGE

Bridging creative, entrepreneurial and technological disciplines places strains on an education system that has tended to treat these as separate subjects, taught through different curricula and institutions.

In the creative industries, stereotypical assumptions about creativity as self-expression and freedom led to the downgrading of "humdrum" work (Caves, 2002) and a hierarchical separation between creative and *uncreative*

work in organisations (Bilton, 2015). In the creative economy, the need for collaboration and multi-faceted creative teams moves in the opposite direction towards greater convergence. By and large, our education systems have not adapted to deal with this convergence. One obstacle is an outdated definition of creativity as an "artistic" specialism, rather than something that cuts across the entire curriculum.

In the report commissioned by the UK government to examine the position of creativity in English schools, Ken Robinson called for a "systemic strategy" that recognises creative and cultural education as "general functions of education", not "subjects in the curriculum" (NACCCE, 1999, p. 6). The report emphasises that creativity is not the preserve of "the arts" or "the creative industries" (p. 28), nor is it restricted to exceptional individuals. Rather, there are "a wide range of intelligences" (including emotional and intellectual varieties) that can all have value in the creative process (pp. 38–9); the creative process is accordingly "multidimensional" (p. 41). Addressing how "creative and cultural education" can be delivered, the report highlights the need for "a balance in the curriculum" between arts and sciences and technology, against the "assumed hierarchy" between core and foundation subjects (p. 59). It is also suggested (p. 62) that a focus on the arts and humanities will be a means of understanding and engaging with the transforming power of *new* technologies ("new" here being what we might refer to as "digital").

Robinson's report (NACCCE, 1999) contains recommendations for funding and teaching training, in addition to detailed recommendations for restructuring the school curriculum, including:

- abolishing the hierarchy between core and foundation subjects (which has tended to prioritise or "protect" science subjects);
- reorganising the curriculum around learning areas or subject groupings rather than discrete subjects;
- moving towards greater autonomy, choice and "self-directed learning";
- resisting a growing emphasis on summative assessment ("teaching to the test").

Twenty years on, none of these recommendations has been implemented. Indeed, more recent educational reforms in the UK have hardened the distinction between STEM subjects (science, technology, engineering, mathematics) and humanities. The newly minted English Baccalaureate (EBacc), designed as the new gold standard to measure school and student performance at secondary level, does not require any creative arts subjects. The polarisation of STEM subjects and creative arts subjects begins at secondary level and transfers into universities. In 2011, the Warwick Commission found that "only 8.4% of students accepted for Creative Arts & Design undergraduate

courses had taken Maths A-level, and only 5% of those accepted for Maths and Computer Science courses had studied A-level Art and Design" (Neelands et al., 2015, p. 45). At the same time, the space for cross-curricular formative education has shrunk (partly due to cuts in local school budgets, but also in response to government education reforms that encourage an exclusive focus on "core" – principally STEM – subjects). The pressure on young people to pursue a specialised education at secondary school is further exacerbated at tertiary level by the introduction of student fees for higher education, encouraging students to view education in terms of commercial employability rather than other forms of development (social, personal). Universities also play their part in this narrowing of "creative" horizons.

While Robinson's report (NACCCE, 1999) has been widely praised for its ambition, this may also have been its undoing. Perhaps, in commissioning such a report in the first place, the UK government anticipated a narrowly defined examination of arts provision in schools. Instead, in pursuit of a *creative* curriculum, the report ranged across every aspect of school education, setting challenging targets for a more integrated, balanced and inclusive curriculum. Did Robinson go beyond his brief? According to the arguments in this chapter, such a wide-ranging approach is inevitable to advance an integrated, creative education; however, from the perspective of governments that seek quick wins and are reluctant to undertake expensive, risky and electorally contentious reforms, it is perhaps unsurprising that such an approach has proved politically unpalatable.

In terms of its highly specialised, subject-based approach to secondary and tertiary education, the English system may be an outlier. As pointed out in the document, many of the reforms advocated in Robinson's report were already common practice in other countries (NACCCE, 1999). But in the gap between recommendations and implementation, Robinson's report highlights the wider difficulties in promoting the kind of balanced, integrated and multi-faceted education necessary for the future of work in the creative economy. A further explanation for the "failure" of the Robinson report may be the argument that the UK government preferred to pursue its own "dominant pro-market construction of creativity" (Neelands and Choe, 2010, p. 301) rather than Robinson's pervasive, democratising vision of creativity as socially and personally transformative. Here, too, the UK's political and economic pragmatism may be part of a wider challenge for creative education, not just a problem in English schools. Where the UK fails to lead, others have followed. In their examination of Singapore's investment in creative education in universities, Comunian and Ooi (2016) note that initiatives appear to be economically driven, benefiting a relatively small proportion of students rather than developing "a local ecosystem of creative and cultural production" – and that Singapore's "hierarchy of competences" continues to rank arts and culture

behind scientific knowledge (pp. 74–5). Singapore's ambitious programme of educational reform, designed to promote employment in the creative economy, appears to entail greater specialisation and individualisation in education, not less.

Perhaps, then, if creativity rests upon "a synergistic interaction between science and technology on the one hand and the arts and humanities on the other" (NACCCE, 1999, p. 76), the solution is not going to be found in schools. Short of the kind of wholesale reforms promoted by the Robinson report, formal state education systems are framed by a range of political and economic priorities that mitigate against the free-flowing, synergistic approach that might release and transform collaborative creativity. For technologists and artists to collaborate, this chapter has advocated a meta-level awareness of both one's own and others' "creativities", allowing individuals with different backgrounds, skills and experiences to collaborate across specialisms. This is the essence of Creativity 2.0, and it is unlikely to be found in a formally assessed school curriculum. It might be found in extra-curricular activities, non-assessed personal projects, and visits and partnerships beyond the school gates (all of which are being squeezed out by a combination of tightening budgets and narrowing targets, at least in the state-supported sector). More likely, it will be found outside our schools and universities entirely.

Just as Robinson's report (NACCCE, 1999) extended its scope beyond "arts" subjects across the curriculum and into partnerships and organisations outside the school, we may need to expand our definition of creative education still further. The kind of formative interactions at the core of Creativity 2.0 take place in workplaces and communities, in addition to formal educational settings. Providing space and time for these encounters to occur then becomes a task for organisational managers and urban planners, as well as freelancers and micro-enterprises, especially those working in the digital creative economy. Cultivating a meta-level awareness of connections between disciplines and skills is something learned from experience, through practice. Allowing time for curiosity, risk and experimentation in the workplace, allowing greater social connection in mixed developments, and designing flexible workspaces that encourage interaction and collaboration can all play a part in providing these opportunities for mutual self-discovery and awareness. All of these things in turn require a tolerance for waste, risk and failure, rather than a targeted, narrowly focused approach to solving immediate problems and tasks, which is not easy in a time of rising competition, declining infrastructure and reduced state funding.

CONCLUSION

This chapter has argued for an expansive definition of creativity that includes the delivery and experience of creative content, not just its origination. This seems to resonate with an expansive and "contextual" definition of innovation in the creative economy. According to Wijngaarden et al. (2019), creative workers considered innovation not as a goal but as a by-product of the creative process, measured in terms of artistic or social purpose, not just as the generation of something new. This means acknowledging that some of those processes, people or interventions that might previously have been regarded as uncreative or oppositional to the creative process are in fact integral to it. Uncreative people can add value by recognising and filtering creative ideas or by highlighting the creativity of incremental change, innovating by "thinking *inside* the box". Above all, uncreativity connects innovation to value, integrating what is new with the affordances that make what is new achievable and recognisable to others, locating novelty in a field of value.

In today's creative economy, digital technology has become one of the most critical of these affordances for creative value. At the level of distribution and dissemination, digital platforms connect creative ideas to audience experiences, and feed information about those audience experiences back into the creative process. At the level of production, technologies provide accessible and affordable means to democratise the creative process, allowing professional and amateur creatives access to the means of production. Web 2.0 provided digital tools for users to generate their own content, and Creativity 2.0 describes this merging of creative ideas with technological means.

Creativity 2.0 depends upon a merging of artistic and technological competences, both at the individual and collective level. For the individual, some meta-level awareness is needed to recognise the strengths and limitations of a singular approach to creative work and to see past the raw idea (especially if that idea is one of our own). At a collective level, creative teams require not only a diversity of talents and approaches, but also the emotional intelligence to bridge different, sometimes opposing, visions and mindsets. Diversity is a necessity in a creative team, but diversity must also be recognised and acted upon.

Training people to work in collaborative creative teams will not be possible if education is understood and measured simply in terms of individuals acquiring specialist skills. Digital technology offers significant affordances for creative work. The competences needed to act upon these affordances can be nurtured through education. First, education at secondary and tertiary level needs to allow students to bridge between creative arts subjects and science and technology subjects. Second, creative and cultural education should be directed not

only towards skills development, but also towards an understanding of creative work as a collective practice, not (or not only) an individual talent. Allowing and encouraging students from different disciplines to work together will help them to develop this meta-level appreciation of diversity and combined talents through students' own experiences. Third, creative education needs to be embedded in a participatory educational culture that nurtures localised ecosystems of collaboration, not just the unleashing of individual talents. As noted by Robinson and his colleagues (NACCCE, 1999), this approach to creative and cultural education necessarily extends into partnerships and projects outside the educational institution and beyond the exam-based curriculum.

This chapter has considered the need for a more integrated approach to education, extending "creative education" beyond its association with arts and humanities, and applying principles of creative thinking across every aspect of the curriculum. The failure to implement most of the recommendations of the NACCCE (1999) report on cultural and creative education in the UK highlights the political and pragmatic challenges of pursuing this approach in our increasingly goal-oriented education systems. As the example of Singapore indicates, the UK emphasis on specialisation and hierarchical distinctions between arts and sciences is hardly unique. The combination of creative and digital skills described in this chapter is symptomatic of the more collaborative and interdisciplinary practices emerging in the new creative economy. In a special issue examining creative careers and higher education in the UK and Australia, Bridgstock et al. (2015) argue that preparing students for creative careers calls for a more holistic approach, specifically "recontextualisation and reinterpretation" of previously acquired skills, knowledge and practices (p. 340). It is clear that preparing for careers in our future creative economy is not only a task for schools and universities: we need also to look beyond formal education towards the way we organise our workplaces and our working routines, and the way we plan our urban spaces. Through a better understanding of these challenges, we can hope that even if education cannot provide the solution, it can at least cease to be part of the problem.

NOTES

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2. These codes are used in the UK to classify jobs and occupations in UK census data. Standard Industrial Classification (SIC) classifies businesses according to the economic activity they are engaged in. Standard Occupational Classification (SOC) classifies individual workers according to the work they do and the skill level required. Historically, it has been difficult to apply existing categories to creative industries and creative work respectively, making it difficult to quantify the scope of the sector. An improved classification system was introduced in 2014,

promising a more robust measurement of the UK's creative economy. There are similarities here with the Creative Trident model in Australia.

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