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Cultivating imaginative thinking: teacher strategies used in high-performing arts education classrooms

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This article reports on recent case-study research that examined teacher- and student-level processes in nine Australian arts classrooms. The selected classrooms, based on the results of a connected longitudinal study, demonstrated strong positive links between arts participation and academic motivation, engagement and achievement. The focus here is on how teachers supported their students to conceive, shape and present imaginative work. Although different approaches were apparent in the dance, drama, film, music and visual arts classrooms, patterns were detected in the processes used to transform imaginative ideas into a creative work. The research indicated that important skills were being developed as the students encountered the ambiguity of the creative process. Furthermore, insights were gained into how work drawing on the imagination can be initiated and sustained through the highs and lows of development to become both a work of art and a learning experience that will augment future creative work.

Keywords: imaginative thinking; creativity; arts education; imagination

Introduction

The research on creativity is extensive and crosses many disciplines. While acknowledging the significance of studies that have mapped advances made over the last 50 years (such as Feldman, Csikszentmihalyi, & Gardner, 1994; Kaufman & Sternberg, 2010; Runco, 2004; Sawyer, 2012) this article will narrow the focus to examine the role imaginative thinking played in nine Australian arts classrooms. We draw on three ideas to frame our understanding of imaginative thinking. Hammershøj (2014) argues that creative processes are driven by imagination, judgement and transcendence. He claims, drawing on Kant, that the imagination synthesises and connects, often unconsciously, myriad stimuli such as images and ideas into a whole. Educational psychologists Scardamalia and Bereiter (2006) assert that such transformative processes require effort and skill; 'generating ideas appears to come naturally to people, especially children, but sustained effort to improve ideas does not' (p. 100). This is a concern for cultural theorist Ziauddin Sardar (2010), who contends that the imagination shapes reality, which is therefore dependent on 'the quality of our imagination' (p. 443).

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In this article we consider imaginative thinking as the process of synthesising multiple 'inspirations' (such as ideas, images, knowledge) in the development of creative work. We are concerned with how imaginative thinking is activated, supported and used to develop high-quality creative work in arts classrooms and the ongoing benefits that imaginative thinking may have for students over time. In doing so, we are mindful that imaginative thinking can be theorised as one dimension under the broader creative thinking construct, such as in the significant body of work developed around 'possibility thinking' (see for example Cremin, Burnard, & Craft, 2006). We are also mindful that some would suggest that imaginative thinking is predominantly conceptual whereas creativity reflects the more operational element of imagination (Robinson & Aronica, 2009). Notwithstanding these nuances, and with due regard for the fact that these discussions and debates are ongoing (see for example Hargreaves, 2012), we do not dwell on this distinction.

We will draw on the qualitative case study findings from a recent mixed-methods research study that was funded by the Australian Research Council (ARC) and conducted in partnership with the Australia Council for the Arts. The Role of Arts Education in Academic Motivation, Engagement and Achievement (AEMEA) was a research project conducted over four years (2010–2013). A key aim of the case-study phase was to understand the processes and practices that contributed to the students' learning in nine exemplary Australian arts classroom.

Recent theoretical perspectives on imagination

The idea that imagination enables us to contemplate and to shape the future has been central to many theories on creativity: theories that emphasise agency (Montuori, 2011), transformation (Greene, 1995a, 1995b), originality (Runco, 2004), disruption and subversion (Florida, 2002), the capacity to tolerate ambiguity (Eisner, 2002; Sternberg, 2007), futurism (Sardar, 2010; Vygotsky, 1967/2004) and visualising 'What if?' (Craft, 2001b; Cremin et al., 2006; Jeffrey & Craft, 2006). Much of this research emphasises exploration and discovery. Sardar (2010), for example, uses the term *postnormal* to encapsulate twenty-first century 'complexity, chaos and contradictions' (p. 443) and regards the imagination as the necessary means to chart a new ethical 'age of normalcy' (p. 443). Others emphasise the necessity of risk-taking and mistake-making in exploring new ideas and terrain (Burnard & White, 2008; Chappell, Craft, Rolfe, & Jobbins, 2009; Sawyer, 2012; Sternberg, 2007). In this context of exploration and discovery, imagination is often linked to our individualised means of expression and the way we 'connect with the world' (Greene, 2013 p. 251). Imagination therefore has an important role in education.

However, as standardised models of education have prevailed, the value attached to imaginative thinking has diminished. Eisner (2002) argues, for example, that the emphasis on 'facticity, correctness, linearity, concreteness' underestimates imaginative processes that are 'absolutely central to our cultural development' (p. 198). Likewise Greene (2013) contends that imaginative thinking is being repressed and buried beneath 'the incessant insistence on the standardisation and measurement of teaching and learning' (p. 251). In this context imaginative thinking is arguably provocative and subversive because it does not seek confirmation in an existing body of knowledge (Florida, 2012; Gibson, 2010). This may explain why arts subjects such as drama, which are often about imagining new futures, have been marginalised within curriculum hierarchies (Anderson, 2014). As Harris (2014),

drawing on Halberstam (2011), argues, 'the risk of failure necessary for true creative exploration is anathema to a global neoliberal culture, including (or especially) sectors like education' (p. 18) – sectors now focused on competence, certainty and reproduction.

Does the imagination belong in twenty-first century education?

Educational policy in many countries has recalibrated over the last four decades as the role of education in economic development and international competitiveness is emphasised over its social and cultural role (Burnard & White, 2008). The place of creativity in this education landscape has become something of a paradox. National and international policy bodies have on the one hand emphasised accountability and standardisation (for example OECD, 2013), while others have called for greater inclusion of innovation and creativity in school curriculums (for example the OECD report by Vincent-Lancrin et al., 2014). Frameworks designed to measure outcomes are often the mechanisms used to achieve these different objectives (OECD, 2013). There is a certain irony that qualities associated with the imagination such as pondering 'what if' can be thought to fit comfortably within frameworks attached to knowable Key Performance Indicators. Beghetto (2008) argues that in this climate there is the potential for imaginative thinking to disappear from the curriculum due to perceived irrelevance or because it is seen as disruptive to environments that value external standardised testing. In his study on the attitudes of pre-service teachers, Beghetto found most believed imaginative thinking may 'distract from and distort academic "truths" to be learned in school' (p. 140).

Social constructivist teaching models emphasise socio-cultural approaches and regard a high-functioning learning environment as being creative, collaborative and dynamic (for example Craft, Cremin, Burnard, & Chappell, 2007). Not surprisingly, arts educators and researchers have frequently adopted such models. Sawyer (2004), inspired by drama and jazz improvisation, conceived of successful pedagogy as 'scripted improvisation' as a reaction against scripted teaching, which emphasised rigid curriculum compliance. Rogoff (1994) theorises on the 'transformation of participation' (p. 209) and distinguishes between gaining knowledge through the transmission of others and through the acquisition or discovery by the individual learner. In an effectively functioning community of learners, knowledge transformation occurs through group efforts. Constructivist approaches such as these, however, have had their critics. Kirschner, Sweller, and Clark (2006) reject unguided and unassisted problem-based learning and assert that there is 150 years of evidence 'that minimal guidance during instruction is significantly less effective and efficient than guidance specifically designed to support the cognitive processing necessary for learning' (p.76). This sharply contradicts the findings of some cognitive studies in the field of arts education, including the extensive body of work undertaken by Harvard's *Project Zero* team over the past 50 years (such as Gardner, 1989; Gardner & Hatch, 1989; Hetland & Winner, 2004; Hetland, Winner, Veenema, & Sheridan, 2007).

The AEMEA case study research engaged with these ideas in three key ways. First, the research examined the processes used by the students and teachers to engage their imaginations in the development of creative work. Second, the research documented the development of skills linked to imaginative thinking. Finally, the research examined whether arts learning was perceived by the teachers and students as building skills additional to other forms of learning in school.

Frameworks for capturing processes

The current research applied a quality teaching framework (Ladwig & Gore, 2006) designed for teachers in the large New South Wales public school education system to interpret our classroom observation data. The operational definitions applied to the categories of this Quality Teaching Framework (QTF) highlighted the lack of value attached to creativity. Creativity is not referred to at all in the framework and the only reference to imagination is in the suggestion that 'imaginative stories' can be an effective remedial strategy for students 'less skilled at using abstract concepts to demonstrate their understanding' (p. 51). During our analysis we noticed significant processes in the classrooms that were not accounted for within the framework including the development of imaginative work. As Charmaz (2004) explains, in qualitative research 'silences are significant' (p. 979). In our research, qualities omitted from the framework and discussion paper (Ladwig & Gore, 2003) and which related to creativity and imagination were important to understanding key processes in the case-study classrooms.

Successful arts educators create learning environments where students are required to formulate and solve problems (Burnard et al., 2006; Charleroy, Gentry, Rubiono, & Schatz, 2011). More often than not their students work independently to generate narratives or other art works that are to some extent drawn from their imagination (see for example Mages, 2006). In these contexts, arts teachers act as guides or facilitators, encouraging students to persist and to 'extend the period in which their ideas do not quite converge' (Sternberg, 2007, p. 14). Many theorists have emphasised the nurturing role the teachers must play in cultivating the abilities of students to work skilfully in these environments and to develop particular dispositions (Craft, 2001b; Eisner, 2002; Greene, 1995b; Hetland et al., 2007; Seidel, Tishman, Winner, Hetland, & Palmer, 2009). In successful arts classrooms, students learn to develop their capacity for imaginative activity (Craft et al., 2007 drawing on personal communication with Spendlove; Eisner, 2002; Greene, 1995b). McWilliams (2008) in developing her theory on 'meddler-in-the-middle', emphasises the need for reciprocity between teacher and student – the latter being given 'the capacity to edit reality' (p. 267).

The Studio Thinking Framework (Hetland, Winner, Veenema, & Sheridan, 2013; Hetland et al., 2007), has developed around four studio structures of learning: demonstration-lecture; students-at-work, critique and exhibition; and eight studio habits of mind – develop craft, engage and persist, understand arts worlds, stretch and explore, envision, express, reflect and observe are intended as 'a set of lenses for observing and thinking about teaching and learning the visual arts and beyond' (Hetland et al., 2007, p. 109). The authors, basing their study on exemplary visual arts case-study classes, emphasised the transference of the findings (Lincoln & Guba, 1985) across the arts and many educators regarded this text as a significant breakthrough for arts classroom practice because the ideas could be directly applied or adapted to the classroom. The AEMEA research offered an opportunity to explore whether there were patterns in the processes of nine exemplary arts classrooms across five art forms – dance, drama, film, music and visual arts.

Research rationale and design

A number of claims have been made concerning the paucity of research into the nature and impact of school arts education programmes in Australia (Bryce,

Mendelovits, Beavis, McQueen, & Adams, 2004). Gibson and Anderson (2008) argued that 'concerted, sustained research' (p. 110) is urgently required in Australia to match efforts already undertaken in the United States and the United Kingdom (Deasy, 2002; Fiske, 1999; Harland et al., 2000). Current debates in Australia regarding the proposed national arts curriculum have arguably intensified this need. A recent review of the curriculum commissioned by Australia's Federal government (Wiltshire & Donnelly, 2014) asserts that the curriculum over-emphasises *making* at the expense of *learning to make*, questioning the rigour of the curriculum. The outcomes of these debates will have a defining impact on the way the Arts are taught and learnt in schools, thus increasing the urgency to understand in what ways participation in arts education is valuable to student development. Up to now the role of imaginative thinking has not been prominent in previous Australian arts education research (Harris, 2014). The current article attempts to rectify this by drawing on findings from the AEMEA project to examine how imaginative thinking was supported and developed in the case-study classrooms. Our focus on this aspect allows us to explore a theme that was significant to understanding the success of these classrooms. This is in line with the findings of a number of landmark international studies such as the UK's National Advisory Committee on Creative and Cultural Education (National Advisory Committee on Creative & Cultural Education (NACCCE), 1999), which emphasised the importance of imaginative thinking.

The AEMEA study set out to establish the impact of in-school and out-of-school Arts participation on students' academic and non-academic outcomes. Spanning two research phases (quantitative then qualitative), the project aimed to address issues that have relevance to schools, educators, students, parents and policy-makers. The separate research teams comprised experts in each methodology to ensure the study's integrity (Fleming & Mansour, in press). The quantitative longitudinal study was designed to investigate the links between arts participation and academic and non-academic outcomes (key findings of the longitudinal study can be found in Martin et al., 2013). The quantitative study used data collected from a survey based on the Motivation and Engagement Scale developed by Martin (Martin, 2009, 2010). Fifteen primary and secondary schools from the public, private and Catholic sectors participated in this study. Confirmatory factor analysis and structural equation modelling produced findings based on classroom-level data. The research teams could therefore detect classrooms that demonstrated strong positive links between engagement in arts activities and academic motivation, engagement and achievement and this informed the selection of nine exemplary case-study classrooms. Our intent in selecting the case-study classes was to be immersed in and to understand the processes that underpinned their success. The underlying rationale for this approach was that schools identified as having strong links between arts participation and positive student outcomes would yield a rich source of data on exemplary classroom process and practice. This guided our decision on the types of data to collect and how we would approach the data analysis (see Table 1). While mindful of examining the uniqueness and paradoxes of each case study (Simons, 1996), we also sought confirmation and comparison through a multi-case design (Yin, 2003) that covered five arts domains: dance, drama, film, music and visual arts. This considerably strengthened the study's capacity to influence policy and practice across arts education. The findings reported in this article arise from the case-study research.

Table 1. Overview of data sources, rationale and analytical approach to the data collection.

Data sources	Rationale	Analytical approach
Teachers and students: Three classroom observations based on the three QTF dimensions	To map classroom observations to the categories and sub-categories of the QTF; understand how the QTF dimensions are enacted in arts classrooms; document processes not accounted for within the QTF	Coding and querying audio data and transcription using NVivo for: • Deductive analysis based on coding structured around the QTF categories (Ladwig & Gore, 2006) but paying attention to practices not adequately accounted for by the framework • Inductive analysis based on emergent themes such as processes that initiate and support imaginative thinking (outside the parameters of the QTF framework) • Querying for variation and consistencies across the five arts domains (dance, drama, media, music & visual arts) and across the eight teachers interviewed Audiovisual data are linked to transcriptions and annotations throughout coding process
Teachers: Three semi-structured interviews covering: background; beliefs; professional development; classroom strategies; school culture; reflection on practice stimulated by review of videoed excerpts from classroom observations, a powerful tool for reflecting on educational practice (Burnard et al., 2006; Walker, 2002)	To gain a comprehensive understanding of intrinsic and extrinsic influences on each teacher's practice; understand what contributes towards the decisions they make in the classroom; insights into the support or otherwise of the school leadership and culture	
Students: Students' reflections on their arts learning via iPods distributed in class by researchers	To give students control to choose how they record and make their experiences visible; elicit highly contextualised responses to their arts learning to limit researcher interference	
Small group semi-structured student interviews	To gain insights into the attitudes and beliefs of the students about their arts classes including practices that motivate and engage them; what gives them a sense of achievement; the relationship of their arts class to other subjects	

Data collection and analysis

The qualitative fieldwork took place between September 2012 and February 2014. All participants, and a caregiver in the case of students, were given information on the research, invited to ask questions and voluntarily signed consent forms that met the strict ethics protocols for the university and each of the school systems. All teachers, students and schools were assigned aliases to ensure their anonymity. These aliases are used in the current article. The details of the participating schools are summarised in Table 2.

The data set was extensive. Each case study included an average of three hours of classroom observation films, student reflections, three teacher interviews and one or two student focus groups. The interviews were transcribed; however, transcribing the videoed observations and reflections was neither practical nor desirable. As the

temporal and sequential structure of these data was often integral to meaning (Banks, 2007) we purposely maintained links to the original source throughout the analysis process. NVivo 10® (QSR International, Doncaster, Victoria, Australia) enabled this via timestamps that link transcription and annotation to audiovisual data (Bazeley, 2007). Rather than being silenced through the research process, a weakness previously identified as a lack of empirical evidence in creative learning environments (Davies et al., 2013 see also Nielsen, 2012), the 'voices' of the participants were present throughout the study. This was vital to understanding processes that could be misinterpreted through reliance solely on transcription and notation.

We selected the QTF's three dimensions: Intellectual Quality, Quality Learning Environment and Significance (Ladwig & Gore, 2006) as the framework to interpret the data. Thus we took a deductive approach. The QTF is the pedagogical model for NSW public schools, which account for 70% of schools in that state (Australian Bureau of Statistics, 2013). As such the framework has an influential role in defining quality teaching.[1] This analytical approach, however, revealed some shortcomings in the QTF as the support and development of imaginative thinking, which emerged as a key theme in understanding the processes in the case study classrooms, could not be adequately explained through the categories assigned to the QTF dimensions, listed in Table 3.

To account for some practices and processes observed in the classrooms, we therefore found it necessary to code inductively to emergent categories, confirming prior research into areas such as imaginative discovery (Eisner, 2002; Hetland et al., 2007; Seidel et al., 2009). Using the existing QTF dimensions we added *imaginative thinking* and *experimentation* as sub-categories of Intellectual Quality and *flexibility* and *rapport* as sub-categories of Quality Learning Environment. The operational definitions for these emergent categories are defined in Table 4; the operational definitions of all categories and sub-categories are included as online notes for this article. Inter-rater reliability checks between researchers were undertaken on a sample of the data to ensure coder consistency. The case-study data were systematically sorted, coded, queried and analysed using NVivo® (Snell, 2011). Complex queries such as matrix queries were used extensively to detect relationship patterns between the QTF categories and emergent themes, for example exploring and testing

Table 2. Overview of the AEMEA case study classrooms.

School	School type	Grade	Subject	Participants	Student average age (years)
Ashmore	Public (secondary)	11	Drama	115 Students (s) 1 teteacher (t)	17
Bellevue	Public (primary)	5/6 (composite)	Visual arts	24s 1t	11
CGS	Independent (secondary)	11	Drama	14s 1t	17
		11	Drama	12s 1t	16
NGS	Independent (secondary)	9	Film	15s 1t	15
		10	Music	12s 1t	16
		9	Drama	17s 1t	15
St Mary's	Catholic (secondary)	11 & 12	Dance	17s 1t	17
Total		9 case studies		126 students 8 teachers	

Table 3. QTF dimensions and categories.

Intellectual quality:
1.1 Deep knowledge
1.2 Deep understanding
1.3 Problematic knowledge
1.4 Higher-order thinking
1.5 Metalanguage
1.6 Substantive communication
Quality learning environment:
2.1 Explicit quality criteria
2.2 Engagement
2.3 High expectations
2.4 Social support
2.5 Student self-regulation
2.6 Student direction
Significance:
3.1 Background knowledge
3.2 Cultural knowledge
3.3 Knowledge integration
3.4 Inclusivity
3.5 Connectedness
3.6 Narrative

Source: Ladwig and Gore (2006, p. 56).

relationships between *imaginative thinking* and *higher-order thinking* and between *flexibility* and *self-regulation*.

The case-study research offered us the opportunity to observe how teachers and students approach the creation of new work. In our analysis of these observations we discerned a cycle within the creation process that was present in many of the case-study classrooms. Reflecting on this we constructed a model that characterised what we regarded as five key phases (or turning points) in the process to assist our exploration. These phases were: *sourcing ideas* for the creative work; *sustaining focus* as the students developed their work; *solving problems*, which arose out of sustained focus, which generated further problems and solutions until the work reaches a *resolution* (partial or complete) often through presentation. This was

Table 4. Operational definitions for emergent themes relating to imaginative thinking.

Imaginative thinking	Students generate ideas and images that are new to them through strategies such as improvisation or possibility thinking Example: creating a new scenario; imagining an audience's response to the completed piece
Experimentation	Students trialling ways to transition imaginative ideas into producible work Example: using improvisation to test different options
Flexibility	Teacher and students maintaining an open space that challenges normative proxemics and inspires creative processes such as improvisation and play Example: students demonstrate ownership of the learning (performance) space
Rapport	Relationships formed in a productive space that acknowledges the expert guidance of the teacher and the creative ownership of the students Example: teacher assists students by suggesting strategies to search for answers to creative problems

followed by a period of *reflection and critique*. These phases were sometimes detected within a single class and sometimes over a series of classes as students worked towards a public presentation. We will use these phases as the means to organise the findings in this article. Figure 1 presents these phases as cyclical because our analysis indicated the previous arts experience of individual students had an impact on their experience of the development process. That is, students accumulated skills in areas such as imaginative thinking as they worked on further projects. As the case-study research took place at one time interval we cannot do more than speculate on this based on our discussions with teachers and students and our classrooms observations.

Sourcing ideas: activating the imagination

Teacher Harriet Smith asked her primary visual arts students to close their eyes and imagine. She described a recent trip to the Kimberley region of Western Australia aboard a sailing ship. With deft skill, she invited the children to come on a journey with her and imagine – a brilliant, uninterrupted blue sky, the sound of waves lapping against the hull of the ship, the smell of saltwater in the summer air – and ever so gently, the sight of the majestic boab trees on the not-too-distant shore. With a sense of poetic language, she described the swollen base of their trunks, their bottle-like appearance; how they lose their leaves during the dry winter period to appear old and lifeless only to produce new leaves and large white flowers during the time of her visit. Still with their eyes tightly closed, Harriet asked the children to open their right hand and accept a 'gift' from the boab. Gently she placed a boab pod into each outstretched palm. These would be the beginning of their art-making in the upcoming weeks.

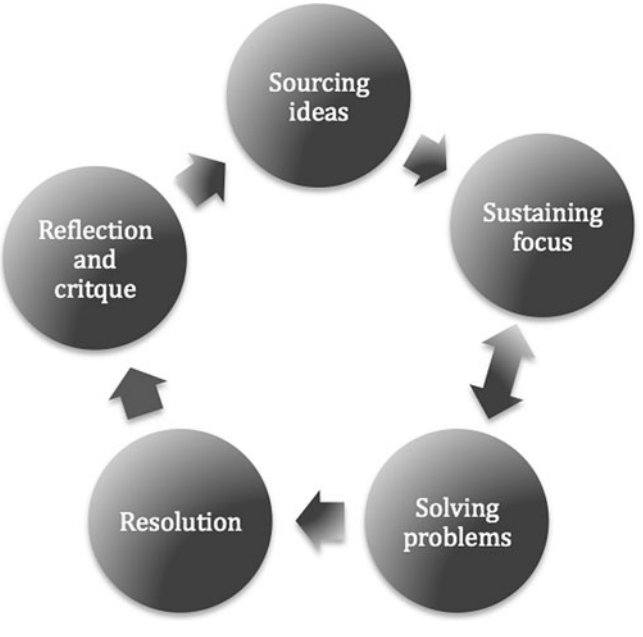

Figure 1. Creative phases identified in the classroom.

The students' imaginations were activated in numerous ways by the teachers in this research. In this example Harriet Smith, a gifted storyteller, used the power of narrative. The students' responses captured in the observations, including delighted 'ahh's and 'whoa', indicated their imaginative engagement. Modelling was another strategy that was frequently used, providing students with examples of excellence to which they could refer and draw inspiration from during the creative process. Dale Mitchell introduced his drama students to the theory and creative work of landmark theatre directors such as Stanislavski and Lecoq, while Jim Jackson regularly drew on the work of composers in his music classes to assist the students in their own composition.

Anna Conway introduced her film students to the opening scenes of classic 'westerns' before sending them out to devise and film their own shoot-out scene. Anna explained that her purpose was to break down and analyse creative decision-making within the constraints of medium and genre. By doing this Anna encouraged her students to aim high: 'if I don't model the best, they've only got each other… I want their world to be bigger'. The discussions generated by the film excerpts showed the students engaged in higher-order thinking (analysing the aesthetic and technical cinematic devices underpinning the scenes) and in imaginative thinking (enthusiastically finding ways to adopt cinematic principles into their own projects). This strategy prepared and supported students as they navigated the ambiguous territory that comes with the creation of new work, and gave them tools to engage critically as artists to transform ephemeral ideas into something that is tangible.

Another important aspect to activating students' imaginations was the cultivation of learning environments that inspired experimentation and discovery. Harriett Smith maintained that the children had to 'learn not to be frightened' and she encouraged the children to be 'risk takers'. Anna Conway went further arguing that we have stopped children from asking interesting questions and instead have encouraged them to edit out their curiosity:

> We have children who are afraid to put their hand up and say an answer, not because they don't know, but because they're afraid they may be wrong. We're sending those kids into the workforce. People afraid to show initiative because they might be wrong. The arts … are the only place that [mistakes are] genuinely celebrated in schools. Mistake-making is the journey.

Mutual respect between all participants was regarded as essential to creating a learning environment that gives students the space to imagine, experiment and make mistakes. Jim Jackson and drama teacher Melinda Perez established ground rules for students, emphasising that while critique was valuable, ridicule had no place in the classroom because this had the potential to disrupt the creative process and confuse mistake with failure. As Jim explained of his music classes, 'There's a lot of structure that I put in place and one of them is that the kids can't fail…. They can take risks and be free to explore creatively.' Such environments of trial and error had a galvanising effect on students, as we will discuss.

Henry (15 years), a student in the Northern Grammar School drama class said, 'my favourite part of the Arts is the beginning processes when you're trying things out'. Brian (16 years), a drama student from Croydon Grammar School, excitedly compared experiences in his other classes with his drama class:

> … you have a textbook, do these questions, the answers are at the back, don't look and drama is like, there might not even be an answer to this, who knows. Go on a journey, write some stuff, you might succeed, you might fail!

Comments from students such as: 'a great class for me is when I get to experiment with our instrument', to 'pool ideas, test them and analyse what works and why' and simply 'getting up and making them work', emphasise the laboratory-like aspect of the process and the willingness of students to participate in the experimental nature of this work.

We have attempted to demonstrate how the teachers used deliberate strategies to activate and support students in their imaginative work while establishing learning environments that emphasised experimentation and risk. Arguably these two aspects set up the conditions for students to persist and thrive as they embarked on their creative journeys. In this ambiguous and complex terrain they had to sustain concentration over extended periods of time.

Sustaining focus and solving problems

We found some evidence that creative work that evolved out of concentrated and often playful periods of experimentation led to the creation of layered and intellectually challenging work. Furthermore, the ability to experiment at this high level was most evident in the students who had attained a degree of mastery in their art form. Music student Grant (17 years), for example, said that he had developed a love of 'the freedom' of jazz improvisation and found inspiration for his compositional work in experimenting through improvisation, yet he also explained this was only possible because of hours of practicing scales. In another example a group of advanced drama students devised a sophisticated performance piece based on their previous knowledge of *commedia dell'arte*. The group worked independently and the piece evolved out of improvisation while also clearly referencing and subverting the genre in ways that demonstrated higher-order thinking. The three students discussed the improvisation process:

> S1: …We were mucking around with music and trying to improvise off the title of the song.
>
> S2: Yep it started out singularly just with taking part of the body and going 'baaboom', holding the heart and then that grew to make up a full scene, so it started out with just a little thing –
>
> S3: (interrupts) and we just kept bouncing ideas off each other.

The students needed to sort, order, critique and synthesise to shape their ideas into work that can be presented. The anticipation of public presentation motivated and sustained many students through the development period. Whereas positive experiences increased the students' motivations and reinforced their 'perceptions of possibility and potential when looking forward to the performance … unsuccessful experiences de-motivated and disengaged students in the creative process' (field notes). The input of the teachers was therefore critical and they adopted flexible and intuitive strategies that took account of individual and group needs. These strategies included:

- Being informed: the teachers listened and watched carefully and remembered details so when they engaged in a conversation with students, which might be a week later, they made direct references to the work thus validating and reinforcing its significance.
- Asking open questions: the teachers encouraged the students to articulate their intentions and thus assist in making the work more tangible.
- Disrupting normal patterns of student/teacher proxemics: for example sitting when the students were standing or standing at the margins of activity, to reinforce student ownership of their work.

The teachers also used strategies to encourage students to persist and sustain effort through the creative process. This example, using field notes, took place over a two-period drama lesson at NGS:

(1) Alex's group has lost motivation and the students struggle to find direction, they are in ambiguous territory. They have accumulated lots of ambitious ideas around stepping from film into live theatre, but there are too many possibilities. Alex [director] complains that the others expect him to come up with all the ideas. 'I can't think of anything more!' he tells Melinda [teacher]. Dis-engagement is apparent in the students' body language as they recline on the floor and look blankly at the ground. Melinda starts a conversation, her incisive questions demonstrate familiarity and engagement with their piece.
(2) Melinda directs the students to the whiteboard. She explains how to build a storyboard and draws several empty frames. She hands the whiteboard marker to one of the students and walks away. The group begins to work together.
(3) The group is observed again with Melinda towards the end of the lesson. They huddle over an iPad showing her the results of their film shoot. They are excited because they have something tangible and they can have faith in their ideas.

This sequence demonstrates how the teacher used her expertise to direct students in the creation process rather than in the creation itself. The CGS drama teacher, Dale Mitchell, articulated this tension:

> My role is to open doors and possibility, not close them and that's art isn't it? … it's original and it's creative, so my role is to try and encourage that process and not to have it done my way. And one of the hardest things for a drama teacher … to direct the process as opposed to directing the creation.

We observed that the teachers 'open doors' through strategies that prompt the students to think deeply about the content of their work and to engage their imaginations. They used their expert knowledge to facilitate rather than control the creative process. They encouraged the students to ask: 'what if' (Craft, 2001a). This was a particularly effective scaffolding strategy for students who lacked confidence. In answering the teachers' questions, students built up layers of detail thus making the work more tangible. Informed questioning by the teachers also served to validate the students' work by treating it with respect, which brought teachers and students

closer together in the creative journey. As Melinda Perez said, 'it is all about relationship. It's about saying the right word of encouragement to the student at the right time.' The teachers also challenged the students to critique and develop their own ideas and this assisted them in the transition from loose imaginative ideas into coherent and technically accomplished creative works.

An essential part of the creative process is for the students to think into the future and to imagine how an audience will receive their work. In doing this they synthesise, contextualise and find ways to clarify meaning. They also strengthen their ability to empathise with others. As one student, Ian, reflected on performing music:

> I just really enjoy what feeling can be made and what feeling I can create myself and for people listening.

Sasha, the drama teacher of Ashmore High School, commented:

> I love the energy of all the kids focused on this common kind of goal and it just teaches them lots of life lessons about the idea of perseverance and overcoming adversity and sticking with something and sticking it through to the end … there's never an easy out, it's going to happen and they have to make it happen.

Resolution, reflection and critique

In presenting their work, the students encounter and learn to manipulate another space of uncertainty, between performer/creator and audience. As CGS drama student Paul explained, 'You don't know how someone is going to react'. The interactivity of live performance offers these students the opportunity to develop valuable skills in reading and responding to ambiguous environments. At best they learn how to be open and spontaneous.

While presentation gave students a sense of completion, our research also suggested that significant learning based on reflection and critique took place after presentation. Indeed, in their self-reflection videos, students expressed their views openly and used language that was frank and even emotional in describing their sense of achievement at presenting their work and persevering through the creative process. For some it was a transformative experience. A film student spoke of his excitement at learning from mistakes. He did not view the flaws in his film as a failure but as the opportunity to do better. This particular student had been struggling at school. As related by Anna (teacher) his parents had been deeply moved by his transformation over the course of studying film: his growth in self-confidence and his attitude towards schooling in general.

Many students spoke of their sense of accomplishment at the end of the creative process. The collaborative aspect of creation in the drama, film and dance classes was considered pivotal. A group of drama students, for example, said:

> S1: You start off with nothing and then you create something. It's just incredibly satisfying.
>
> S2: And it's something nobody's ever seen before.
>
> S3: Yeah it's like completely your own. All you need when you're with a group you feel like a sense of camaraderie and completion.

Through their collaborations, the students learnt to communicate rather than compete with their peers as their success depended on the group as opposed to the individual,

much as happens in real life. In solving problems collaboratively the drama teacher, Sasha, said that they learnt to find 'the best version of themselves'.

Discussion

Accessing and using the imagination in the creation of work requires openness to ideas and images, confidence to trust their potential and guidance to cut a path through the ambiguous terrain of multiple possibilities. The students are developing what has been theorised as a tolerance for ambiguity (Sternberg, 2007). This article has focused on how imaginative thinking underpinned the creative work of students in nine arts classrooms and the processes and practices that encouraged them to access, utilise and cultivate imaginative thinking and be alert to opportunities to do so (Hetland et al., 2007; Perkins, Jay, & Tishman, 1993; Tishman, Jay, & Perkins, 1993). Organising the findings around a cyclical creative development process helped us explore the underlying processes. These processes were: the strategies used by the teachers to guide the students' explorations within complex and ambiguous environments; the provision of safe creative learning environments that encourage students to experiment and persist, and the centrality of self-reflection and class review to extend the skilful use of imaginative thinking.

The findings in this study highlight how the teachers had thought deeply about ways to cultivate what Eisner (2003) describes as 'the capacity to think imaginatively' (p. 343). They consciously sought a balance between teaching the necessary technical aesthetics of craft and the need to establish environments where students create imaginative worlds that they can enter 'perceptually, affectively, and cognitively' (Greene, 1995a, p. 380). Finding the right balance was essential, giving students a sense of ownership that encouraged them to persist as problems arose, while also providing guidance. To this extent our research supports the findings of Kirschner et al. (2006) that guidance is necessary to enable students to make gains in their learning, such as the case of the unmotivated drama students re-engaging with their work after the intervention of the teacher. Yet in this study effective guidance usually meant providing the tools to navigate rather than the map.

The findings indicate that imaginative thinking provides ways for students to thrive in complex and ambiguous environments. Sternberg (2007), Sardar (2010), Florida (2012) and others have argued that as we now exist and work in ambiguous environments we need to explore ways to improve the quality of imaginative thinking. Much of the work focusing on imaginative thinking has been theoretical or quantitative (see Tsai, 2012) and has lacked situated exploration. This study therefore adds a valuable perspective. In rendering a detailed account of processes that cultivated and developed imaginative thinking across nine exemplary arts case studies, the research offers possible identifiers that are present in productive arts classrooms. This has the potential to influence future policy instruments in relation to arts education such as the development of research-informed quality teaching frameworks that capture the conditions needed to cultivate imaginative thinking. While this offers exciting potential we do also recognise that there was a predominance of drama classrooms in our sample and that future research needs to expand into other arts domains.

Finally, the research confirms the centrality of classroom environments that encourage risk, exploration and discovery to the creation of work that draws on the imagination. In being encouraged to create productively within fluid experimental

environments, the students are learning to navigate and negotiate complexity and ambiguity (Eisner, 2002; Sternberg, 2007) and are developing the skills to address 'What if' (Craft et al., 2007). The research suggests that the concept of 'failure' may need further investigation and perhaps mistake-making would be more effectively aligned with the notion of discovery. Harris (2014) argues for instance that risking failure, which she believes is a necessary condition for authentic creative work, is anathema to neo-liberal cultures and is therefore discouraged in formal education. However, if making mistakes is part of the creative journey, as viewed by students and teachers in our research, then defining mistakes as failures is not accurate.

Limitations and ongoing research

The case study research took place during one school term and this meant that in talking about gains made over time we were reliant on observing students with differing levels of experience working together in a class as well as teacher perspectives and the self-reporting of students. We were comparing students at one point in time rather than tracking individual students over time. We are confident, however, that coupled with the supporting evidence of student self-reflections and teacher and student focus-group interviews, it is possible to draw some conclusions. That said, our research leads us to suggest that future longitudinal research would be valuable to understanding how working imaginatively develops through experiences over time. The research also indicates that a productive area for future research may be investigating tensions and points of convergence between constructivist and instructional teaching models in areas such as imaginative thinking. Finally, as the research only involved nine case studies, of which four were drama classrooms, the findings cannot be generalised to all arts education classes. Furthermore, there is a need to expand this research into other arts domains.

Conclusion

This research lends support to links between the quality of imagination and the ability to persist and thrive in complex and ambiguous environments (see for example Sardar, 2010; Sternberg, 2007). It was apparent in this research that, through their involvement in these arts classrooms, students were learning ways to take imaginative ideas and with 'sustained effort' (Scardamalia & Bereiter, 2006) improvise, play, trial and reshape these ideas into work that communicates to others. This creation process required constant monitoring and input from teachers with expert knowledge in the relevant arts domain. We also found that imagining 'What if?' (Burnard et al., 2006) is a fulcrum for creative work in these classrooms. Yet this study takes this further by examining how the quality of our imaginations (Sardar, 2010) might be developed as a result of ongoing exposure to exemplary arts education. That is, our findings demonstrate that teachers are able to establish the parameters within which the students learn how to develop their imaginations as a resource.

Furthermore, in these classes students were creating solutions to problems that had no prior answers. Arguably, through this process students are not only learning how to answer but also how to formulate problems. In doing this, the students are stepping into the future. Achieving this takes confidence and agency and the ability to navigate ambiguous terrain. These findings then draw attention to concepts such as put forward by Sardar (2010) that future thinking is required in uncertain times,

while also returning to concepts developed many years earlier on how creative imagination helps to shape future realities (Vygotsky, 1967/2004). Whether or not one agrees with Sardar's concept of 'postnormal' times, what our research tells us is that the Arts are giving students significant experience in activating their imaginations as a resource to create new ideas and new work. This should make it clear to parents, educators and policymakers that arts education is an important component of an education that learns from the past and welcomes the future.

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Note

1. This is based on the Productive Pedagogies approach that has been widely used throughout Australia and North America.

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