

ENHANCING CREATIVITY FOR GIFTED AND TALENTED STUDENTS: A VISUAL ARTS CLASSROOM PERSPECTIVE

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Abstract

The popular notion of creativity in schools is that of the creative arts student or the creative writer, yet creativity can be utilised as a particular way of thinking with regards to producing information and learning at school which can be applicable across curriculum areas. Many traits and characteristics of gifted students overlap those of creative students as identified in the literature. This paper includes examples of techniques teachers can employ in developing creativity within their classroom, with a particular focus on visual arts using The Dynamic Creativity Process Model. This model is designed to be used across the curriculum as a holistic approach to enhancing creativity and the artistic potential of gifted students. The model supports student learning using divergent and convergent thinking and encourages higher-order thinking, integration, intuition and evaluation.

Introduction

Minds are like parachutes, they only function when open. (Dewar)

The popular notion of creativity in schools is that of the creative arts student or the creative writer, yet creativity can be utilised as a particular way of thinking with regards to learning and producing information at school that can be applicable across curriculum areas (Torrance & Goff, 1990). Many traits and characteristics of gifted students overlap those of creative students as identified in the literature, and this paper discusses the creatively gifted student in the domain of visual arts. Creatively gifted students, for this purpose, are those identified as possessing the characteristics of creative personalities and those having an interest in creative ideas and domains, including those who may be identified as gifted by traditional means (although identification of creatively gifted remains problematic).

Research on creativity often cites a definition of creativity that includes something which is both *novel* and *useful* (Sternberg & Lubart, 1999); evidently novelty on its own does not equate to creativity. For something to be defined as 'creative' there needs to be an innate function or value (Haier & Jung, 2008), be this a product or a creative idea waiting to be realised. Creativity does not always mean the production of a tangible end product. Creativity engages divergent thinking processes whereby various original ideas are generated, and convergent thinking processes which involve combining these ideas to produce 'the' solution or fixed idea(s) (Bronson, 2010).

Thinking and learning creatively entails the skills of evaluation, particularly the capacity to perceive problems, discrepancies and contradictions; to redefine problems; and to engage in divergent production (e.g., elaboration, flexibility, originality and fluency). In contrast, 'learning by authority' requires students to use thinking skills such as recognition, memory, and some logical reasoning — the abilities most frequently assessed and tested in the classroom. Given a choice children would probably choose to learn creatively rather than by rote learning and memorisation of facts and information in a teacher-centred classroom environment (Torrance & Goff, 1990). When engaged in a creative classroom, students often have enhanced learning and often learn at a faster pace (Torrance & Goff, 1990).

This paper aims to show how teachers can suitably structure learning programs that develop the essential domain-relevant skills of visual arts whilst enhancing creativity in students identified as gifted. The ideas and ways of teaching for enhancing creativity in gifted students in visual arts can also be used across the curriculum.

Literature review

Creativity research in the past has focused on trait theories that outline creative personalities as the foundation of creativity and creative achievement (VanTassel-Baska, 2004). Personality types who demonstrate or enjoy academic risk-taking behaviour, independence and freedom from social conventions, all make up the traits of such a personality. The following personality traits of creative individuals have been identified (Clark, 1997; Feist & Barron, 2003; Petrowski, 2000):

- curiosity
- high levels of personal energy
- attracted to complexity and novelty
- tolerance for ambiguity
- open-mindedness
- persistence in the face of adversity.

It is interesting to note that many of the personality traits identified as being useful in developing creativity are on the whole positive; little is discussed in the literature regarding negative personality traits and their potential effect on creativity development in the classroom. Cropley (1994) summarised traits viewed by teachers as being undesirable but common amongst their creative students: impulsivity, non-conforming, disorganised and imaginative. All of these traits would be considered desirable to a certain extent in creativity as they impact on a student's ability to generate creative ideas and products.

Guilford (1950) made the vital distinction between two types of thinking important in creative behaviour, convergent and divergent. Convergent thinking overlaps with typical intelligence notions where prior knowledge is synthesised in order to arrive at a suitable solution (Wynder, 2008). Many teachers and education systems rely solely on this kind of thinking in teaching and assessment where rigid, conventional 'one correct answer' is required, and considered necessary to fulfil curriculum and reporting needs. Convergent thinking is an important aspect of education, however it is inadequate on its own in the process of creativity (Wynder, 2008). Guilford (1950) contended that creativity should be articulated in divergent-thinking terms which would lead to evaluating creativity by way of the quantity of diverse solutions produced (Torrance, 1974; Wynder, 2008). This conception is in harmony with the way many teachers view creativity but is problematic when looking for creativity which is both novel and useful (De Sousa Fleith, 2000). Recognising that both types of thinking are necessary factors in creativity is vital and essential for teachers because how the creative task/problem is presented and assessed impacts on learners' thinking processes (Wynder, 2008). Divergent thinking is necessary so that formerly unseen creative avenues and problems are recognised and potential solutions are explored. The role of convergent thinking is to use information that is relevant and important for creatively solving the task/problem (Wynder, 2008).

A significant quantity of psychology research has examined specific aspects of creativity that can be structured to assist and motivate the process of creativity in students. Many theorise that this process should be carefully managed by teachers so that 'creativity killing' is avoided, particularly by the misuse/overuse of extrinsic motivation (i.e., assessment), which can inhibit a student's creativity (Wynder, 2008). The role of intrinsic motivation in creativity has been examined by many researchers primarily Amabile (1983, 1996) and Hennessey (1996) whose discussions centre on the Intrinsic Motivation Principle of Creativity (IMPC). With the IMPC they theorise that individuals will be most creative when motivated by interest, satisfaction, enjoyment and challenging work, and not by outside inducements (see section below on 'assessment and evaluation'). Many gifted children are motivated by elements that may include challenging work centred on their areas of interest (Bailey, 2004; Gross, 2004).

Sternberg (2000) views creativity as a trait that can be taught and as a decision which is made rather than being a natural ability specific to some individuals (as Gagné, 2008, suggests). Sternberg calls this decision making the 'investment theory' of creativity, which refers to people working with ideas in the way that investors work with stocks on the stock market: buying low and selling high (Sternberg & Lubart, 1995). According to this theory creative individuals produce unusual and unique ideas that can frequently be seen as strange by others. The task is then to try to 'sell' these ideas or stocks to others by emphasising their value. Once enough people have been convinced of the idea's value, the creative person can sell high. Sternberg (2000) believes that creative people then move on to their next unique idea rather than perpetually remaining with the same idea. Whether creativity can be taught to *all* students is a contentious issue, as is the question of whether creativity can be taught at all.

Some researchers (Petrowski, 2000; Sternberg & O'Hara, 1999) have suggested that 'intelligence' is necessary but not enough on its own to initiate creativity, which suggests that many individuals with a high IQ are not necessarily creative or more creative just because they have a high IQ (many IQ scales do not, and arguably cannot, assess creativity). Nevertheless a broader understanding of 'intelligence' is necessary to comprehend creativity and its relationship to 'intelligence'. Indeed, according to Urban (2005)

a specific score on an IQ test reveals nothing about how creative an individual is. IQ tests do frequently point to high academic (school) achievement in students (Neisser et al., 1996); however, results from Urban's (2005) Test for Creative Thinking – Drawing Production (TCT-DP) suggested “low academic achievers do not necessarily have low creative potential, and high academic achievers do not necessarily display high levels of creativity” (p. 275). It is feasible then to be highly 'intelligent', as measured by a narrow IQ test and school standardised achievement tests, but not creative (and vice versa).

The most significant result from some creativity research for educators is that creativity is not absolutely related to 'intelligence' over an IQ of 120 (Hee Kim, 2005; Petrowski, 2000). This finding is referred to as threshold theory. Examinations of threshold theory have shown inconclusive results with a meta-analysis (Hee Kim, 2005) of these data suggesting that irregularities may be the result of differing methods of measuring 'intelligence' and creativity and a variety of sampling inconsistencies (gender, age and socio-economic status), and ways of test administering, i.e., as a test or as a game. This theory appears to be more applicable to some 'intelligence' tests than others (Runco, 2007) but it is consistent with some empirical research.

Creativity needs to be assessed according to the objectives of the task and communicated in a way that 'sells' the idea and is convincing. Such assessment need not be in the form of a final product in the classroom but can be by observation, monitoring during the creative task and assessing the thinking involved throughout the process (see section below on 'assessment and evaluation').

Smith (1990) argued that thought processes proceed in private but that only by exploring human artefacts can we understand the results of these thought processes. This argument is appropriate when creativity is measured by analysis of the creative product. If a domain-specific product is viewed as being innovative in that particular field, then creativity is usually accepted. However, how many innovative ideas (and products) have been shunned by 'experts' only to be accepted long after the innovator of the idea (or product) has died (e.g., the poet Emily Dickinson)?

Csikszentmihalyi (1996) argues, as does Sternberg (2000), that creative products and ideas must be of value to the field and culture of the time thereby implying that good 'selling' is vital. Creativity definitions are elusive because similarly to 'intelligence' and to some extent giftedness, they have different expressions, theories and interpretations and are socially and culturally created.

Creativity and giftedness

Many gifted and talented children who demonstrate accomplishment whilst at school do not appear to progress into creative adults (Winner, 1996), which may suggest that accomplishments valued at school may not involve many of the traits of creativity needed for development of adult creativity. As discussed earlier, being 'intelligent' may not be one of the elements necessary for creativity to be demonstrated. VanTassel-Baska (2004) states that “creativity is an elusive factor in its relationship to giftedness” (p. 1). It would appear that giftedness (the IQ measured 'definition') is a deficient forecaster of creative achievement (Sternberg, 2009). As Sternberg contends, highly 'intelligent' students appear to have enhanced prospects of attaining higher school marks and tertiary degrees and they generally enter higher-paying professions than their school peers yet, they do not appear to be highly creative individuals (Sternberg, 2009). Sternberg (2009, p. 286) suggests that “precocious intellectual talent may be neither necessary nor sufficient for true creative achievement in adulthood”.

According to Amabile (1983), task motivation is an important element in developing creativity. Student interest becomes a motivating factor in accessing specific domain skills, and this needs to be taken into account when developing and teaching creativity tasks/lessons. Some gifted children are intrinsically highly motivated, however educators need to be mindful of studies which have concluded that gifted students can suffer with motivation in classroom settings (Reis & McCoach, 2000). Hennessey (2005) views intrinsic motivation as “a most delicate and often fleeting entity” (p. 1), whilst also recommending that educators should consider that their gifted students' precocious intellectual abilities are not sufficient to ensure that creativity will thrive in the classroom.

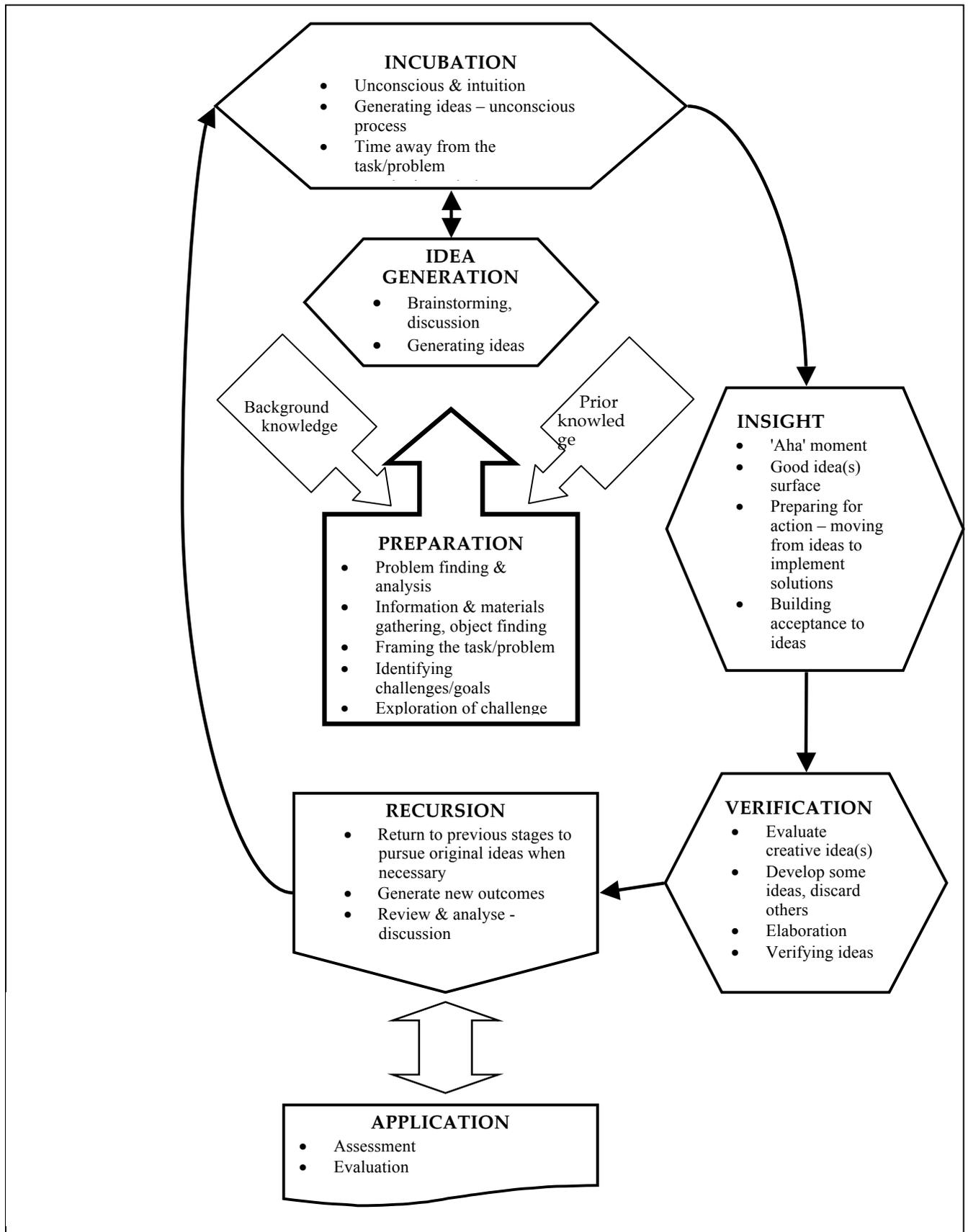


Figure 1: Dynamic Creativity Process Model (DCPM) used to develop a program of activities designed to enhance creativity (after Runco, 2007; VanTassel-Baska, 2004; Wallas, 1926). Note: This is a work in progress.

The classroom environment should be a safe and nurturing place where creative ideas are encouraged and creativity is modelled by the teacher. The teaching environment is crucial to not only developing creativity and giftedness but to maintaining and increasing levels of intrinsic motivation for students and for balancing student knowledge.

Developing creativity-relevant skills in the classroom

To begin planning a program of activities for the classroom to enhance creativity, it is crucial to understand the developmental processes necessary for creative thought. Wallas (1926) suggested a stage model for creativity, which consists of four stages involving preparation, incubation, illumination and verification (Runco, 2007). This model forms the basis for a program of classroom activities with slight modifications, shown in Figure 1 (above). The drawbacks with stage models are that they often assume that the creative process is linear when in practice it is multi-faceted and dynamic. Recent models have included a recursion stage where earlier stages can be revisited and moved through at any point in the process (Runco, 2007). The preparation stage is where a problem is identified and defined, including gathering of information and materials (Hong & Milgram, 2008; Runco, 2007). The incubation stage entails the use of intuition and the unconscious processing of information. According to Lubart (1994) this stage may entail: actively processing information (conscious processing); activation involving deliberate, unconscious dissemination of memory/prior knowledge; reflexive letting-go of insignificant ideas; previous creative attempts; or creating associations between creative components. Lubart (1994) suggests this is an either/or stage and perhaps it should be viewed as a combination of these elements during incubation. Often incubation is where the creative task/problem is set aside and left for some time so the unconscious elements can work and information can be transformed.

Illumination (referred to as Insight in Figure 1) is frequently referred to in the literature as being the 'Aha' moment or the 'light bulb' moment where a flash or illumination of an idea suddenly surfaces into consciousness (Hong & Milgram, 2008). It is doubtful that illumination is as sudden (Runco, 2007) as research suggests because the unconscious has been working on the task in ways that remain unexplained to the conscious mind. Acceptance is being built to the

new idea(s) at this stage including preparing for action. This stage of insightful thinking often leads to one main idea whereas in earlier divergent thinking numerous ideas have been generated.

Verification is where the creative idea(s) are evaluated, where testing and tinkering take place (Runco, 2007). This stage is very important because it necessitates the use of both effectiveness and originality, where some ideas are developed further and others are discarded (Figure 1).

Runco's (2007) model demonstrates the creative process and is not tied specifically to problem solving which is only one part of creativity (Runco, 2007). This stage model can be applied to visual arts and other curriculum areas and is not bounded by the task nor is it specific to finding and defining problems. Background knowledge with regards to the domains where this model is to be used is an important step (Figure 1) which contributes to the creative process as discussed earlier. Epstein (2008) examined how supporting creativity also has the potential to sustain a student's in-depth educational process and performance, further encouraging lifetime learning, which is particularly relevant for gifted learners who need in-depth teaching and learning particularly in areas of personal interest (Table 1).

Table 1: Some anecdotal characteristics from the literature of giftedness and creativity which overlap (after Clark, 1997).

Giftedness	Creativity
Wide range of interests	Broad interests
Abstract thinking; conceptualises and synthesises	Tolerates ambiguity
Curiosity, originality	Defocused attention
Sustained interest	Flexible cognition and behaviour
Intense immersion in areas of interest	Introverted
Often prefers to work alone	Independent, autonomous, unconventional
Interested in novelty, complexity and ambiguity	Open to novel, complex, and ambiguous stimuli

According to a broad literature review with regards to arts-based teaching and learning, school-based arts seem to strengthen and improve children's motivation, cognitive skills, academic performance, interest, creativity, self-esteem and communications skills (Rooney, 2004). If these improvements exist across the spectrum of learners it follows that similar improvements might be expected amongst gifted learners where arts, particularly visual arts, are included across the curriculum with creativity built in to activities and programs. Visual arts can cover all areas of the curriculum including communication, synthesis of ideas and skills, visual literacy and critical thinking. In addition when visual arts are used in a cross-curricular way, students are often taught a novel and distinctive form of cognition, where emotion, unique ideas, originality, in-depth study, innovation and creativity form vital parts of their work (Geist & Hohn, 2009; Jehlen, 2008). Importantly, assessment in visual arts is usually undertaken on an ongoing basis using portfolios of students' studies and work as it progresses rather than just one final assessment (see 'assessment and evaluation' section below).

Developing creativity in the classroom

The following are examples of questioning techniques teachers can employ for developing creativity (Amabile, 1996; Torrance & Goff, 1990). These examples demonstrate the differences between teacher-centred learning/textbook learning, and learning creatively:

- What year did Captain James Cook 'discover' Australia? Requires factual memorising and recognising.
- How are Captain Cook and astronauts similar or dissimilar? This question entails the students' creative thinking rather than just recognising and memorising information.
- If Captain Cook had 'landed' in Perth, how would our lives and Australian history be different? Answering this question necessitates the use of myriad creative thinking techniques embracing experimentation, imagination, discovery, elaboration, resolution testing and communication of findings.

With these examples in mind, creativity can be developed in the gifted education classroom, where students should have been selected not solely on academic achievement but on potential

(inclusive of students who underachieve) as well. Criteria for identifying gifted and talented students need to take into account Gagné's (2008) model of giftedness where students are at differing levels of development. Identification of gifted students should use tools such as checklists, portfolios, above-level testing, psychometric testing (where affordable and possible), creativity tests such as Urban's (2005) TCT-DP, and portfolios of students' work. Learners who are twice-exceptional, underachieving or from minority groups should not be overlooked when identifying gifted and talented students for inclusion in gifted education programs.

Modelling creativity

In developing creativity within classroom environments teachers have to model the processes of creativity and applying the steps involved in particular models of creativity. Students need to be involved in active learning (Cornish & Garner, 2009; Merrotsy & Lamoureux, 2010) within the classroom; class discussions and brainstorming sessions are common strategies for promoting this type of learning (Bonwell & Eison, 1991). Discussion is utilised in several processes involved in The Dynamic Creativity Process Model (DCPM) shown in Figure 1, including Idea Generation and Recursion. Discussion and student-centred learning are preferable to the teacher-centred approach, as these approaches support students to develop thinking skills and apply these in new situations (McKeachie, Paul, Yi-Guang & Smith, 1986). There are drawbacks to active learning such as time constraint, increase in preparation time, class-size constraints, and limited equipment, materials and resources (Bonwell & Eison, 1991). Careful planning and preparation should overcome many of these barriers and with particular reference to the program of activities for visual arts, creative use of a 'free' array of used and recycled materials will ease the constraints relating to materials and costs. In the Idea Generation Phase brainstorming can sometimes be problematic in that students might 'copy', intentionally or otherwise, their peers' ideas. This unlikely scenario is outweighed by the reported sense of 'flow' which participants report experiencing (Runco & Pritzker, 1999).

Program of activities for enhancing creativity

The factors and research discussed have been utilised as the foundation to develop a series of activities designed to enhance creativity in gifted

students in an independent secondary school in Queensland (Grade 11/12).

In the two school terms prior to commencing the program of activities, structured, planned and subject-focused activities would be utilised that are not too abstract for students as an introduction to creativity. These activities would include background knowledge on visual arts terminology, symbolic language (symbolism), materials and techniques, and the study of artists and art history where the teacher would be actively teaching content in preparation for term three's program (see the task sheet example below). These initial projects would be concrete examples of creativity with discussion focused on the DCPM in preparation for the program of activities. The teacher would use scaffolding to facilitate each learner's ability to use and build upon prior knowledge, learning and absorbing new information according to Vygotsky's (1978) 'zone of proximal development' (ZPD). These start-up activities would be scaffolded to be a little beyond the student's current level (Olson & Platt, 2000) in a way which would not be overly difficult and would allow for forward movement in a student's learning. In this way students will have the opportunity to make their own discoveries in their learning, increasing their level of creativity.

The following task sheet example includes an ambiguous introduction for the program of activities designed to enhance creativity in gifted visual arts students.

Task Sheet

Year 11 & 12 Visual Arts Term 3 2011

Project 1: Exploring Creativity

Quote: *Minds are like parachutes, they only function when open.*

Vice and the Elephant's Versa

An ant lay hidden, though uninjured, underneath the left front foot of an elephant. Underneath the right back foot, in a somewhat more distressed state, was a mouse.

The elephant, aware of the dilemma of these two creatures, remembered a challenging circus trick whereby the front left and rear right feet were lifted off the ground at the same time. Being slightly aged now, it took immense exertion and concentration to accomplish this position. After a short while it found itself poised precariously on only two legs. Both the mouse and the ant darted out and headed for the nearest cover. The elephant again found itself in the same

predicament as before. Where formerly there had been a mouse, there now hid an ant, and vice versa. (Popular story)

Your tasks (should you choose to accept them):

Part 1: (working in small groups)

Day 1:

- Discuss the parachute quote above – brainstorm ideas about what it might mean – jot down your findings.
- Discuss and brainstorm the *Vice and the Elephant's Versa* story – jot down your findings.
- Come back into whole-class discussion, one person from each group to present a summary of the ideas from the brainstorming sessions.

Day 2:

- Research the ideas etc. behind the quote &/or story – online, books etc.
- Write/draw or otherwise summarise your discussions and research – should be included in your visual diary.

- Part 2: (Not shown until day 3)

Day 3:

- Working alone
- Select a manufactured object which you can obtain and work on (must be discarded, very cheap or otherwise freely available) – justify your choice. Document your choice and include in your visual diary – documentation could be in the form of sketches, drawings, photographs, written ideas etc. – research.
- The object must be able to be easily carried by one person and should be something that can be brought to school, not dangerous or poisonous etc.

Day 4:

- Bring in your manufactured object.
- Progressively investigate your chosen object – can be online, books, discussions, asking experts in the field, watching documentaries, etc. Keep ongoing records of your investigations including references, bibliography and lists of people you have discussed your object with (don't forget to include dates).

Days 5–10

- Do something to this man-made object, e.g., dismantle, tear, break, bend, join, squeeze, fold, crumble, stretch, deface etc. It can still have a function (but it

doesn't have to) when you have finished altering it but the function should be different from its original intended use.

Relate the quote and story to these tasks and your object. Record and describe visually each stage of change in as many different ways as you can (remember to record dates, times, etc.). The project can remain unresolved, though not incoherent. Visually manifest things as you go along. Try not to anticipate any eventual outcomes, keep an open mind, and keep your enquiries open-ended.

Days 11 & 12

- Present your project to the class – presentation should include aspects of the project from start to finish, justify your choices along the way – ten minutes for each presentation.
- Presentation can be in a form of your choice – PowerPoint; movie; posters; storyboard; timeline; artwork; animations/cartoons etc. (Almost unlimited choice – please discuss your ideas with me prior to commencing.)

Applying the DCPM model

The Dynamic Creativity Process Model (after Runco, 2007; VanTassel-Baska, 2004; Wallas, 1926) is designed to be used across the curriculum, not just with visual arts projects. The model should be applied in a non-linear way where movement between phases is two-way (apart from Preparation). This model is designed as a holistic approach to enhancing creativity and the artistic potential of gifted students. The model supports student learning using divergent and convergent thinking and encourages higher-order thinking, integration, intuition and evaluation. The suggestion of problem finding in relation to creative expression implies that creative thinking and creativity can be precisely represented, which is debatable but consistent with cognitive research (Runco, 2007; Shepard & Cooper, 1982). This assumed delineation was the foundation for Wallas's (1926) four-stage process model of creativity (on which the DCPM is based).

Carroll (1990) suggests that visual arts enable connections to become established between people and their cultural/universal identities, historically, presently and into the future. These connections in turn can relate to other curriculum areas such as science and maths,

representing self-knowledge and learners' understanding of their world (Carroll, 1990). Creativity in this way builds students' artistic language and avenues for expression, increasing meaning, creative thinking and expression, offering an avenue to 'touch' cultural and symbolic meaning whilst enabling cultural expression.

Program of activities

The main ideas behind the design of the program of activities on the task sheet are abstraction and metaphorical thinking, where new ideas, cognitive restructuring, analogy and new information, along with associative and combinational thinking, are encouraged and applied in the field of visual arts. The following represent possible examples of discussion points for the program of activities.

Vice and the Elephant's Versa possible discussion point examples:

- Had anything changed in the story?
- What had changed in the situation?
- What remained the same?
- What could the elephant see, how did he/she perceive the situation? Compared to the mouse? The ant?
- What was the ant's view of the situation? What might it have been thinking?
- What was the mouse's view of the situation? What might it have been thinking?
- If we change something, how far do we have to go in changing it before it becomes something new?
- What do we mean by the term 'new'?
- Can this item be used in a new way? For a new purpose?
- Use of imagination, visualisation
- Re-manufacture, recycle, re-use.

Examples of possible discussion points from the program of activities:

- Quote is attributed to physicist James Dewar in books and distiller Lord Thomas R. Dewar (1930s) online! – Critical literacy in use here.
- Possible discussion points: open mind = non-judgemental, open to new ways of doing things, open to new thoughts. See opportunities rather than obstacles.
- Open mind in action

- Before you think about the meaning of this quote, you need to be clear of some terms that seem to be quite obvious, but they aren't:
 - What is a parachute?
 - What is mind?
 - What is the difference between a closed and an open parachute?
 - So what might an open mind be?
- Parachutes, light, soft fabric, silk? Used for? Slowing something (person, object), as they move through space by creating drag (science curriculum could be included here).
- What is the collective reference of 'mind'? Aspects of consciousness, 'intelligence'? – perception, thought, emotion, imagination, memory, will, etc.
- An open parachute is obviously 'in action' or being 'used', while a parachute that is not in use is closed and packed away.
- Can be a functional and dysfunctional mind (compared to a closed and open parachute)

The creative ideas that can be generated using the DCPM are not necessarily the result of solving a problem per se. There is an assumption that prevails in the literature about there being a final product in creativity and creative problem solving. Creativity does not always have to involve a type of problem solving and product generation; creativity can be contained within the ideas generated in the problem-solving process. Thus problem solving is a type of creativity (Runco, 2007) which falls under the umbrella of creativity.

The initial quotation and story in the task sheet are deliberately abstract and the activities are also deliberately ill-defined, creating a dilemma for the student, challenging their tolerance of ambiguity. The resulting dilemma is a certain kind of 'problem' that is open-ended (enabling divergent thinking). Runco (2007) states that a dilemma has two possible options (thus the 'di' prefix), neither of which will entirely resolve the problem. By taking any one choice, the other option is lost.

These activities are designed to enable gifted students (with scaffolding) to express themselves artistically, in the best way possible. By working through the program of activities the students will be able to examine an avenue of expression, the one which interests them the most from their

previous studies and knowledge. Looking for the best form of expression implies a problem (Runco, 2007). These activities are designed for artistic exploration, offering choice and self-expression whilst creatively 'solving' the dilemmas presented in the forms of the quotation and short story.

Students have to decode the quotation and story and are presented with Part 1 of the task before seeing Part 2. Part 1 involves discussion and brainstorming, and occurs in the phases of Preparation and Idea Generation of the DCPM. Information and ideas generated are noted/sketched in the student's visual diary (spiral bound/hardback sketch book), as a record of ideas and thoughts. The teacher's role (at this stage) is to guide discussion where necessary but it is envisaged that once students break off into groups they will be able to lead their own discussions and brainstorming sessions. Teachers need to make it clear to students what the expectations are, having previously discussed the processes of creativity and presented the DCPM to students.

Both deduction and induction are necessary inferential methods which enable students to depart from the information they have been presented with in the tasks (Bruner, 1962). The students will use deductive logic in working from the abstract concepts in the quotation and story, to more specific reasoning. The second part of the task involves students in utilising inductive reasoning working from the specifics of the tasks to general applications of the ideas to manufactured objects and then back to deductive reasoning as they narrow down their ideas. Additionally interpolation and extrapolation are needed to make predictions within and outside the information presented for the task. There is an intrinsic and extrinsic problem presented in the activities where students are finding a problem of expression (artistically) (Runco, 2007), and sorting out their responses to the quotation and story.

Research on Day 2 activities will enable students to synthesise and augment their ideas in preparation for Part 2 of the task. In Part 2 students are expected to obtain a readily available (discarded) manufactured object on which they can base their work. A series of tasks is presented for students to work through individually as they develop their project which can remain unresolved but not incoherent. The work is exploratory, allowing students to work creatively using the DCPM where they can

express themselves and refine artistic techniques learned in previous school terms.

By allowing students to make choices and follow their own research direction in the task, teachers are empowering their students and creating ownership of the processes, which is particularly important for gifted learners. The task's other characteristics of analytical thinking, curiosity and the opportunity to engage in the creative processes previously studied (in Terms 1 and 2) are also important in empowering student task commitment and ownership.

These tasks invite independent learning, original work, experimentation and student interest. The process and phases of the DCPM lead to other ideas that enable students to engage with the ideas and research background information to make their creative experiences rewarding. Teachers can encourage creativity during this task by listening and considering student ideas and encouraging students to test their ideas and communicate their research and findings to the class.

The students are involved in experimentation, use of their imagination, discovery, elaboration, resolution testing and then communication of their findings. The task is open-ended and aims to allow students breadth and depth in the scope of their work. The communication stage is open and students are encouraged to be creative in their choice of presentation and communication methods.

Assessment and evaluation

Assessing creativity in the classroom appears too difficult as the often subjective nature makes it difficult to grade (Burke-Adams, 2007). If there is an end-product that is the result of creativity, teachers feel they have something substantial and tangible that they can assess. On the whole, surveys of teachers have found that they believe assessing creativity tasks is too subjective and thus unfair and that they rarely include explicit assessment criteria in their evaluations (Randi & Jarvin, 2006) particularly if no end-product is produced. Reis and Renzulli (1991) found that formal assessment of learners' creative products was scarce and rating scales were used infrequently and involved vague criteria.

Omitting creative assessment from marking criteria for students' work conveys an implied message to students, that creativity is not valued in a school setting (Sternberg, 2003). However

teachers who are experienced and able to operate at a level of expertise in their teaching area, should be able to assess students' creative work in the same way that experts in the field assess creativity (Amabile, 1996; Sternberg & Lubart, 1995).

Urban's (2005) TCT-DP instrument may be useful in assessing creativity, as has been explored by Bröcher (cited in Urban, 2005) in a pre- and post-test assessment of creativity training with gifted students. The TCT-DP assesses developmental stages of creative abilities in individuals arising from initial autonomous drawing/scribbling where ability to recognise information is non-existent, through to formed holistic compositions, where individuals have attained a high stage of creative achievement.

Prior to and during the tasks students will be involved in discussing what constitutes creativity and how creativity can be assessed. In addition students will have opportunities to add their marking criteria for the task using brainstorming and discussion. Students will also be given copies of the marking criteria and assessment sheet, following their input, so they are aware of the assessment methods and how work which is challenging, original, unique and imaginative will be graded.

The main marking criteria would be bounded by the context of the project and how appropriate the student's work is in comparison to this context (Sternberg, 2000). Students are expected to produce work that demonstrates their understanding of the conventions of visual arts (from the previous two school terms' lessons and other prior knowledge). The students' work will be assessed on:

- being highly original – quantity and applicable quality of initial ideas
- uniqueness – in comparison to the work of their peers and artists working in the field
- idea synthesis – how they have combined their ideas and used their research base
- analysis – of the quotation and story
- practical application – their 'creation', their changed object
- creativity – how creative and imaginative their work and changed object are; their work in their visual diaries, how they kept track of their ideas through the tasks; how they used

their ideas from their research and applied them to the task of altering the manufactured object

- communication of their findings and ideas in their presentations – method of communication, originality, uniqueness.

Rewards (such as stickers and ticks) can be detrimental to creativity if the underlying reason a student performs a task is to gain an extrinsic reward from the teacher. Hollow praise is detrimental to creativity in the same way. Evaluation and assessment need to factor in creativity as subjective and this should be detailed enough so students understand the expectations from particular tasks. Time limits are unavoidable in classrooms, but students should be encouraged where possible to pursue their task outside school or at break times. Hovering over students whilst they work is detrimental to creativity especially if performed in a controlling way. Amabile (1983, 1996) studied artists and found the general applicability across student populations of the IMPC was probably limited because the research population was restricted to artists, so what motivates that population may not necessarily motivate another. It is, however, pertinent to this paper and to visual arts practice and developing a program of activities to utilise findings from Amabile's (1983, 1996) IMPC research.

Conclusion

Visual art is traditionally viewed as an area where creativity flourishes. However, the subjectivity of the domain often places it at odds with other curriculum areas where 'correct' answers are the norm. By enabling gifted and talented students to engage in practical projects specifically designed to allow for creative thinking and by combining this with 'traditional' creativity of visual arts, these learners are empowered to apply their thinking in other curriculum areas and outside school. In this way they are supported and encouraged at school to form unique, novel and useful ideas.

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