Know How: A Pedagogic Approach to Encourage Creative *Ideation* in Classroom Technological Practice.

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Abstract

The learning area of technology essence statement refers to Technology as intervention by design, where the use of practical and intellectual resources are used to develop quality outcomes. These outcomes are seen as the result of critical, informed and creative thinking and practice, Ministry of Education (2007, p.32).

These required attributes and skills provide a direction for a pedagogic approach that will guide learners, at best, towards perceptive, creative and informed decision making at the core of Technological Practice. Consequently teachers need to be able to implement learning experiences where students may develop ways of thinking to enhance their own creative practice.

The purpose of this paper is to share a teaching and learning strategy to go towards meeting the real intent of the learning area of Technology.

Key words: *Ideation, conceptualise and develop ideas, visual literacy.*

Introduction

After two decades of curriculum development, the area of technology education has at best, seen a shift in focus to a more faithful representation of related communities of practice. There is still however, much debate over the benefits learning in technology offers our students. Much of the community still views the area as either requiring low-level intellectual skills while involved with skill acquisition, or only learning that pertains to digital technologies. Whereas the real intent is to prepare our young for "full functionality in human society" through "developing creative and inventive minds" (Hope, 2008, p.49).

On going research into design and teaching practice to inform creative classroom practice has identified parallel key events enhance students' creative practice.

This paper looks at one such event; the stage of Ideation in creative design practice to provide insight and transferable skills to inform classroom practice in the generation and development of ideas. The ideation stage encompasses intial and developing rapid idea generating around a theme. This occurs at the onset of design processing and throughout the practice when a creative or innovative shift in thinking is required. The outward evidence of ideation appears as visual communication strategies that document the results of thought generation and manipulation to communicate ideas. The development of visual literacy skills may be perceived as an essential requirement in a world that increasingly demands multiple literacies to participate effectively.

The teaching of design ways of *knowing through thinking and doing* (Sharma and Poole, 2010, p.65) or to use Cross's (1982) term 'designerly thinking' will contribute a means to meet our curriculum area's vision, while developing transferrable thinking and decision making skills. Such practice would re-instate curiosity and the inquisitive attributes of childhood imaginative interplay, in a meaningful way to reflect the ideation stage of creative design practice. Design thinking, I propose, will also engage those learners whose needs are not met in the education climate of gaining knowledge and theorising. These students are often turned away from learning, because their creative attributes have not been recognised or valued.

Theoretical background

Many theorists are calling for change in education processes as our current systems are "not designed to respond to the new digital and global age" Mishra and Kereluik (2011, p.3302). Their review of seminal and contemporary literature offers a global perspective of emergent research themes around 21st century learning. They identified 3 categories *Foundational knowledge, Process knowledge* and *Meta knowledge* with sub-categories to present a framework to inform contemporary education. A sub category of *Process knowledge* is allocated to creativity as an "often cited skill… necessary for success in the 21st century." They also observe that creativity and innovation involve applying a wide range of knowledge and skills in the generation of novel and worthwhile products (tangible or intangible). They note "critical components" evident in creativity and innovation, as well as the "ability to evaluate the effectiveness of ideas and products, elaborate on existing ideas andproducts, and refine ideas and products in pursuit of specific end goals" (p.3308).

Gardner (2008) identifies mindsets that will better equip people to deal with what is expected and "what cannot be anticipated" in the changing world of the digital and global age. He draws upon the fields "of history, anthropology and other human disciplines" further speculating on the direction that our society and our planet are heading" where "political and economic considerations loom large." He suggests ways to expand and form the minds of learners so that they "will not be at the mercy of forces that he or she can't understand, let alone control" (Gardner, 2008, p.2).

Gardner's five minds explained by Mishra and Kereluik, 2011 as:

1. The *disciplined mind* is the master of at least one domain, and through mastery achieves autonomy.
2. The *synthesizing mind* takes information from disparate sources and domains, evaluates the information and reorganizes it in new ways….
3. The *creating mind* puts forth new ideas, asks and seeks answers to important un-asked questions, and in doing so stays ahead of computers and robots….
4. The *respectful mind* welcomes and encourages differences among individuals….
5. The *ethical mind* … works beyond self-interest and contemplates one's work in conjunction with the needs of society at large (p.3302).

Gardner's new minds or the dispositions they engender align directly with the creative designer's repertoire.

This paper offers an approach to initiate the development of thinking strategies to align with Mishra & Kereluik and Gardner's ideals to better equip our students for their future.

Pink (2005, cited in Mishra and Kereluik, 2011) also calls for changes in our educational approach alluding to ways of thinking through the development of insights that celebrate human sensibilities. He asserts

> that a definitive shift is taking place in the advanced world, one from a logical technical age to a conceptual age…. Pink's senses include design to change the world in significant ways, story or narrative, imagining focused on understanding, symphony and synthesis, empathy, play, and the pursuit of meaning (p.3304).

Hope (2009) in her research into the conceptual foundations of designing from an educational perspective, further suggests that in the development of an informed population, "equipping children with practical design capabilities is probably one of the most essential components of their education" and, further, that our species and planet may "depend on their design decision-making" (p.54).

My own observation contributes to the rationale for teaching and learning ways of design. As students become familiar with the human design decision maker in roles across a range of

contexts, they develop a perceptive understanding of people and the interface with their environments. They will be also laying down a solid foundation of thinking strategies for life long learning.

A final view to support the rationale for an all-embracing approach to teaching and learning comes from Parry (2011) writing about Design & Technology in Britain where she suggests that today's "learner must be analytical, evaluative, entrepreneurial, technical, scientific, artistic, physically fit, philosophical, emotionally intelligent, mathematical and reflective" (p.25).

These views allude to a broader more flexible approach where learners are guided to construct their own meaning by learning to ask their own questions about a situation, artefact or human condition.

Views from design practice

Research into the realm of creative design practice, where human-centred, imaginative interplay of ideas is planned for in supportive environments, offers parallels to emulate in classroom practice. (McGlashan, 2010).

One of the research particpants: Dean Poole, creative director and co-founder of the award winning Auckland design company Alt group, explained his studio's ways of creative design practice to provide insights to inform design pedagogy. When reflecting on his own practice, Poole noted "When you need to find a new idea, you need to find better ways of having conversations, by asking better questions." He added, "Most design ideas come from people having conversations with themselves or each other or even with an artifact, business or experience,"(p.242). Poole saw the part of dialogic journals that are always there to catch ideas as they emerged as an integral part of designing. The journal is also where the recording of points of interest or the manipulation of thoughts, when discussing ideas with others (McGlashan, 2014).

All three of the designers interviewed spoke of the ever- present ongoing internal dialogue that guides their design journeys.

The designers also spoke of the important part played by the immediate working environment or studio, as a space that supports and inspires creative response.

The physical and emotional environment plays a significant role to encourage creative thinking and activity in design practice, as explained by all three designers interviewed: David Trubridge an internationally aclaimed NZ product designer and Carin Wilson whose experties lies is in the realm of Maori architecture and furniture design:

> Poole spoke of a thoughtfully planned physical work environment that supports and encourages broad debate and risk taking, that has a 'family feel.' Wilson deliberately plans his 'safe' yet dynamic work environment as "a place where he can think, a temple." His studio walls, vibrant with selected images, trigger creative thought and responses. He spoke of the need for times of total immersion in the design theme when he "uses music to fill himself with imagery and inspiration from many sources, including nature." Trubridge spoke of a similar state where "design thinking requires a relatively unstructured approach to time," one needs "to be prepared to wait for a solution to present itself" and to allow time to "just be with the idea." He added that there are periods of incubation, in his practice, where he allows the ideas to sit. During this time there are often "moments of illumination and discovery." (McGlashan, 2011, p.281).

IDEO hailed as one of the world's most innovative design firms, promote "a collaborative and continually evolving approach" to design thinking. Kelley (2001) explains the design methodology employed by IDEO as a well-developed and continuously refined model with five basic steps that include:

- Observing…real people in real-life situations to find out what makes them tick, what confuses them, what they like, what they hate, where they have latent needs not currently addressed.
- Visualise new-to-the-world concepts and customers who will use them. This is the most brainstorming intensive stage. …Visualization may take the form of computer-based rendering or simulation. IDEO builds many models, including illustrative storyboards, to prompt useful dialogue and visualize the customer experience….
- Evaluate and refine prototypes in a series of quick iterations, not getting too attached to first models, as they will change…. (Kelley cited by McGlashan, 2011, p.279).

Schon and Wiggins (1992) also affirm the essential part of visual communication strategies such as sketching/thinking where "as a designer draws, she makes discoveries…features and relations that cumulatively generate a fuller understanding, or feel for [the focus] configuration... (p.155).

Creative practice is well steeped in visual literacy for the development and sharing of ideas. Visual communication underpins idea instigation, manipulation and discussion. Encouraging learners to engage in and develop the rapid capture and real exploration of their ideas is at the core of creative classroom design and practice.

Such learning will enhance student design Ideation and further exemplify many of the NZC Key Competencies and Values (MOE, 2007, p.10 & p.12).

These attributes and activities need to be taught and can be fostered from an early age (McGlashan, 2011, p.282)

An approach

> *Learning to draw is really a matter of learning to see – to see perceptively – and that means a good deal more than merely looking with the eye*
>
> Kimon Nicolaides (1990)

The teaching and learning of design thinking initially requires a focussed yet flexible teaching approach. It stands outside yet contributes to all related specialist technology domains. Views on what makes the best teaching have shifted over the last decades away from requiring that pedagogy was centred on knowledge; that teaching needed to impart subject specific knowledge within the domain of focus, towards encouraging and faciliutating learners to develop their own constructs through experience, Brown, J.S., Collins, A., Duguid, P. (1989).

Thinking sketching stimulates, generates, receives, interrogates and communicates ideas. Making a perfect drawing does not feature at the ideation stage of designing. Focus is on the generation and communication of thinking, thoughts come in many guises, never tidy. The importance of sketching/drawing "within design processing is manifold." Sketching "is an excellent way of expressing the emotional character of a product…. using the designers personal signature" Eissen & Steur, (2011.p.6).

Most sketching communicates information about shape and form through a lively interaction rather than a rigid process. Words as annotation can be added as they evolve to enhance the narrative.

Some typical sketches at early stages of Ideation are referred to as thumbnails or even doodles, both can be quite small at this stage of design because there is no need for detail. Initial ideation sketches may lead to producing another sketch, improving the first or extending to another new sketched idea.

One of two things may occur with a first sketch: either something comes up that was not detected while the idea was still inside the your head, or this idea was already there in a different sketch previously captured in a journal or sketch book.

Initial sketches are not subject to any critique, that will come at a later stage, as it is important to keep the flow of ideas going. In the ideation phase it is important to generate many ideas, exploring several variations, to result in a range of ideas. The ideation phase will conclude with a selection of these ideas to continue with. These are the potentially good ideas that may grow into a real proposal or concept (Eissen & Steur, 2011,p.13).

Setting the scene

This approach has evolved over many years of observing and trialing learning strategies to encourage creative responses across a wide range of learning levels from child to adult. Ideation begins the designing narrative by engaging the imagination and curiosity to empower learners to think at a deeper broader level to probe their own idea generating talents.

Preparation of the physical and emotional environment is an essential first stage to set the scene for effective learning idea generation and manipulation.

The physical learning environment where creative activity will take place is an important contributor to the success of the experience. Postings of visual prompts, evidence of cutting edge and seminal design outcomes from across all disciplines including jewelry and accessory design, contemporary music and street culture, graphic design, digital media, fashion/textiles to spatial design examples will inspire the learner. Music to suit the activity and learner taste is another important inclusion to create an ambience in the learning space, where curiosity, intrigue and anticipation are engendered.

To create an emotional environment that encourages learner potential, it is best to not allow space for the critical mind to intervene, especially at early stages of ideation. Codes of behaviour for the room developed by learners themselves, are encouraged through pertinent questioning such as: Which conditions would help you to feel comfortable enough to share your creative ideas? If the learner has created the codes of behaviour they will own and monitor their use. Post their codes in full view in the designing room.

Consideration also of the choice of paper to capture ideas assists in confidence building. A pristine white paper can inhibit the flow of creative response; it is best to select the natural tones. The use of a pen to capture ideas denotes courage and commitment, whereas a pencil image may be erased.

First rapid visualization strategies are employed to free up the designer. To disregard or quiet the critical mind, rapid visualization exercises instigate and keep the flow of sketching going to make the shift from tangible to in the head ideas.

The strategy selected to meet this paper's aims, sharpens observational skills, to faithfully record the tangible, translating visual prompts to sketches. This activity also triggers imaginative thoughts that form innovative new idea. These ideas are often grounded or enriched by recollections of similar artifacts in other situations.

The teaching role is to guide the experience with prompts to keep the momentum of the activity and therefore ideas flowing.

It begins with an element of surprise and follows this sequence of events:

1. As students settle to learn, they are asked to go outside and select a small item of nature (3 – 5 minute).
2. Students return to a large piece of recycled paper and they are asked to really observe and become at one with their chosen item, to isolate their thinking from everything else in the room.

3. They are then guided calmly through how to observe their item, as they observe and record their findings of outline texture, shape, form, as quickly as they can rotating the item to view it from all sides (5 minutes).
4. Note: there is no room for their internal critic here, no judgement needs to be made, just a faithful recording of what they actually see.
5. Students are then given prompts to use the pure shape/form of their chosen item to influence new design ideas for:
    - a piece of a jewelry (3 minutes)
    - a type face/font for the first letter of their name (3 minutes)
    - a coffee table (3 minutes)
    - a garment (3 minutes)
    - a building can specify (café for senior students at their school – 3 minutes)

This activity has proven to empower those beginning or returning to idea generation and communication. It encourages the quick rapid flow of thought required at the onset of designing prior to conceptualization. It encourages students not to overwork or sanitize initial ideas but move on to another sketch or overlay to further develop ideas towards potential outcomes.

The timing of introduced activities or influences is crucial to each student's generation of original thought. This activity is best experienced prior to students being introduced to any existing works either by designers, artists or prior students or even to a proposed design brief. This suggestion stems from a long held observation that people will make comparisons between the work of others and their own attempts to such an extent that they judge their ideas as being less worthy than those of others. They acquiesce due to lack of confidence in their own burgeoning ideas and feel that this (the work of others) must be what is expected of them. They choose to emulate what is offered rather than stand beside their own ideas.

Conclusion

The design thinking /sketching shared activity, is one of many that will exemplify the new approach to learning called for by theorists, to enable our to better participate in their future. The activity exemplifies the intent of Gardner's five minds. The first three minds where the disciplined mind sees the learner introduced to and begin mastery of the design domain. The synthesizing mind sees learners taking information from one source to translate into a range of applications. The creating mind is thinking of new ideas, asking questions of the artifact through rapid idea generation and visual communication. The respectful and ethical minds are employed when designing for the human interface occurs at the time of Ideation around design brief considerations.

Preparation for teaching Ideation at best aligns with creative design practice. The creation of a positive human and physical learning environment where all ideas are encouraged without fear sets the scene. Classroom practice is further informed by design practice through encouraging the use of a journal as a collecting place for ideas.

Visual communication occurs as part of the processing of all design, yet the ways of thinking/communicating ideas are best explored in full with time set aside for discovery and enjoyment. This life skill will further provide another literacy to ready our young for "full functionality in human society" through "developing creative and inventive minds" (Hope, 2008, p.49).

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