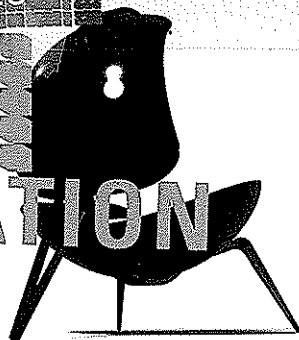


FRESH THINKING DRIVES

# CREATIVITY INNOVATION



Chair inspired by the circular form

**LARRY VINT** WWW.GRIFFITH.EDU.AU  
LECTURER DESIGN, GRIFFITH UNIVERSITY

As educators we encourage lifelong learning, helping students to prioritise what to learn, how to learn and what issues are most vital to engage with. We provide the most timely content that corresponds to the needs of students. Unfortunately, many of us do not teach the students how to think creatively.

Creativity and innovation are the future drivers of the global knowledge economy. 'Industries of the mind' will play a central role in regional and national economies and ideas will be the most valuable resource in the market place. If Australia wishes to be at the creative end of the knowledge economy, it all starts in students' early years. Hardcore technology skills are important and essential, but producing young imaginative minds is crucial - people with stirring imaginations that dream and think creatively.

In order to take our student base to the next level of creativity and innovation, we need to take them beyond the rigid policies, prescriptive processes, and fragmented organisational structures of education that have stifled true innovation for too long. To create an environment of fresh thinking, to inspire and generate ideation in our classes, a mindset of continuous innovation at every stage of learning needs to be adopted, one that will allow students to achieve and sustain creativity and leadership in all their areas of study.

## CREATIVITY IS NOT LEARNED, BUT RATHER UNLEARNED

For our students to be creative and innovative, to become leaders in their fields, teachers must develop the best climate to stimulate innovation, execute the processes that spark innovation, and deliver maximum results. It is a myth that creativity is a gift that a few select people are born with. As children, we were all more creative than we are today. Perhaps not to the same degree, but we all do have innate creative abilities. All of us have the potential to be creative and innovative. Through research study findings, this premise has been tested, documented, and published many times (George Land & Beth Jarman, 1992; James Higgins, 1996; Linda Naiman, 2000). As young children we are more creative because we are looking through 'unpolluted' and 'unsullied' fresh eyes. As teenagers and adults, we start to filter everything we see, just like a polarised lens that lets in only light that is aligned one way. To reverse the years of filtered thinking, we need to start connecting experiences and synthesising new ideas. We need to teach our students the creative steps to bring out new, innovative and imaginative ideas. Ideally, creative ideas that the students themselves thought they could never have previously conceived.

The reason children are so creative (Stephen Shapiro, 2001) is that they look at the world with fresh eyes. They are always collecting information, data and particulars that they eventually compile together. Everything is a new experience. And rarely do kids jump to quick solutions. However, once they start going to school and socialise with other children, they are forced to fit

in. Peer pressure drives conformity. Education focuses on the regurgitation of facts rather than on gathering new experiences. Within a school and at university, students choose major areas of study and become proficient, and sometimes expert, in that area. As we get older we find things in life that we like, to the exclusion of all else. We read the same sections of the newspaper. Read the same magazines. We watch the same style of movies. Narrow down the foods we eat. Socialise with the same friends. We tend to find ways of functioning within our lives that work for us. We use these modes continually without trying anything new, such as our thinking patterns, communication style, our view of the world, and our political thoughts. As we get older, instead of collecting 'ideas', we begin a process of information elimination. We continue to narrow down our relevance, concerns, curiosity, concentration and awareness as we get older.

In 1968, George Land (George Land & Beth Jarman, 1992) gave 1,600 five-year-olds a creativity test to see how highly creative they scored. This was the same test used by NASA to select innovative engineers and scientists. He re-tested the same children when they were of 10 years of age (1978), and again at 15 years of age (1983). He later tested 280,000 adults to see how highly creative they scored. The test results were:

Age group tested	Number tested	Year of testing	Percent who scored in the 'highly creative' range
5 year olds	1,600 children	1968	98%
10 year olds	1,600 children	1978	30%
15 year olds	1,600 children	1983	12%
25+ year olds	280,000 adults	1985	2%

In Land's research of 1,600 five-year-olds tested, 98 percent of the children scored in the 'highly creative' range. When re-testing these same children five years later, only 30 percent of these 10-year-olds were still rated 'highly creative'. By the age of 15, just 12 percent of them were ranked in this category; while a mere 2 percent of 280,000 adults over the age of 25 who had taken the same tests were still on this level. "What we have concluded," wrote Land, "is that non-creative behavior is learned." From this and similar research we can conclude that creativity is therefore not learned, but rather unlearned. We as teachers need to reinforce and encourage student's fresh thinking and promote high levels of creative behavior, enriching their thinking skills - critical thinking, problem solving and decision making.

Through well thought out projects and classroom activities, with well designed briefs, enriched thought provoking content, encouraging guidance and frequent feedback, in conjunction with external influences such as media input, guest speakers and excursions, we can begin to reverse these figures.

## WHY AREN'T ADULTS AS CREATIVE AS CHILDREN?

For most, creativity has been buried by rules and regulations. Our educational system was designed during the Industrial Revolution over 200 years ago to train us to be good workers and to follow instructions.

Creativity is the collecting and connecting of ideas, disciplines, ways of looking at problems, and experiences. In order to tap into this innovative potential, we cannot revert back to a second childhood or hire five-year-olds. Albert Einstein once said, "Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world." (Linda Naiman, 2000). Knowledge in many ways is the enemy of creativity, for once your brain finds what it thinks is the best solution, it stops looking. We look for solutions in our memory banks of what has worked in the past. Finding an answer quickly is often not the best solution and often undersells our ability and intelligence. Unfortunately, these solutions might not be new, innovative, or even good. What we need to do is train our brain to keep looking, even when we have found an answer.

## CREATING A CULTURE OF INNOVATION & CREATIVITY

World-wide we have a talent shortage. Educational institutes and industries that understand the relationship between creativity, innovation and performance, and actively promote creativity in their students and staff, will be the winners in the marketplace. The root of invention and innovation is creativity.

Listed below are techniques to get you started in creating a culture of innovation and creativity within your classroom.

**1. Connect and synthesize new experiences.** Creativity is having the ability to connect and synthesize ideas, disciplines, ways of looking at problems, and experiences. By encouraging students to collect and hoard every experience for later use, these stored random experiences can be used as the catalyst for breakthrough thinking. Experiencing more and analysing these experiences is one reason some students are more creative. Like through the eyes of a child, having fresh approaches by looking at the world in a new way, with simplicity and imagination, students will then begin to see what they have never seen before, and be able to expand what they focus on. Students will see, interpret, and sense new things through these new filters.

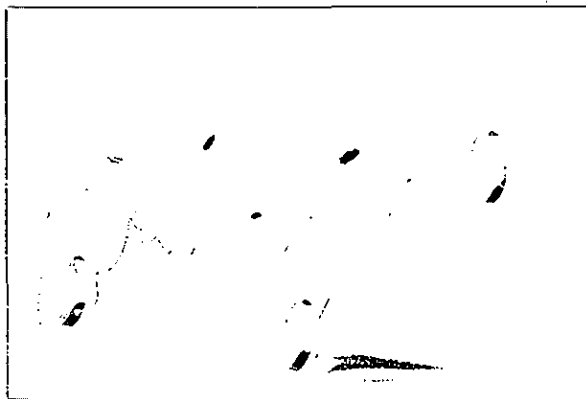
**2. Break old patterns.** During class, students tend to do the same things over and over because our teaching is repetitious. Break this pattern. Give students unusual, controversial, and critical resources that they have never seen before. Test and expand their ideas on things they previously did not like. Introduce them to new people and

influences. Try different angles of analyses of theories. The more you do this, the more new experiences they will gain and the more ideas they will be able to draw from in the future.

**3. Reinterpret needs which reflect the now.** As adults, when we try to solve a problem, we often try to pull the answer from our knowledge bank, just like finding the solution in a text book. By solving the problem the way it has previously been solved provides a limited set of possibilities; one of replication and regurgitation. An alternative and more insightful way of looking at problems is to make connections and find analogies, metaphors, and associations that fit the problem you are looking to solve. Recombine ideas in new ways. If a student is redesigning an interior design space, they need to look at what the design is really about. For example, if redesigning a cultural centre, look at hospitals, airports, subways, hotel foyers and cinema designs to see how they deal with human traffic. Also look at ant colonies and bee hives, anything with a flow. One needs to take the design a step further and look to non-educational connections, analogies, metaphors, and associations. Students have limitless ways of recombining their ideas to create something new and creative. This is not about invention, which is pulling something out of the thin air. Innovation is about reinterpreting situations creating scenarios. Students should not always go for the obvious solution. Some of the best ideas come from some of the most unlikely combinations and abstract references.

**4. Look at nature.** Look at nature, the evolution process, the ecosystem, micro organisms, astronomy, music, or any other discipline of interest to be inspired by to find solutions. These have unique attributes that provide an endless source of inspiration. The careful observation and analysis of one or more of nature's forms can yield a wealth of practical and useful attributes in terms of structure, form, geometry, unique mechanisms, use of colour, surface language, pattern and practical strategies. For example, a student wishing to design a chest of drawers may be inspired by nature, through analysing the giraffe. The student looks at nature's characteristics, instead of reinventing the design. The chest of drawers could be inspired by the structure, form and geometry of the giraffe's neck. The texture, pattern and varnish colour may be inspired by the giraffe's surface language and colour. In another design, a computer mouse could be designed inspired by the man-o-war jelly fish; the design being comfortable, flexible and therapeutic to hold, having nodules and being transparent in appearance.

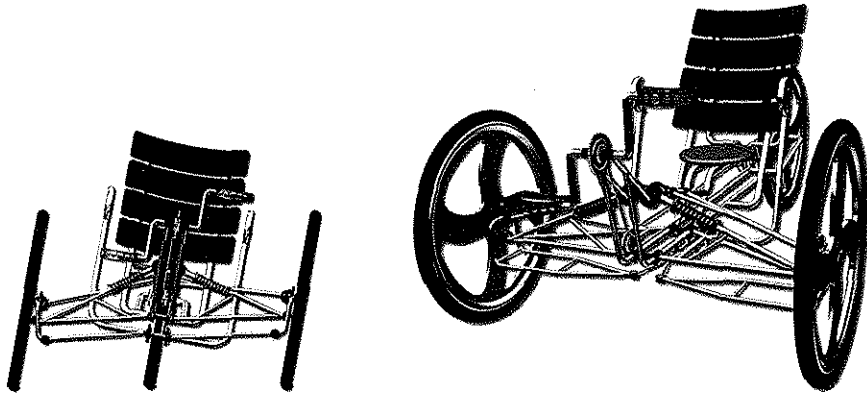
**5. Force illogical assumption combinations.** Turn everything upside down. Bring out the hidden assumptions we take for granted by asking the questions 'who, what, where, when, how, and why'. Challenge the models of assumption.



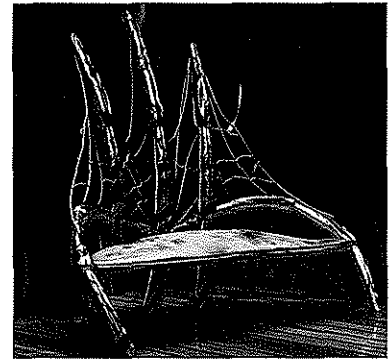
Creative & innovative vehicle design



Bar stool inspired by preyling mantis



Uniquely engineered cycle design



Chair inspired by spider

This may include forcing illogical assumption combinations. Ask students to come up with various answers to some or all of the listed assumptions to solve a problem. Then randomly mix and match these various combinations. For example, in the process of redesigning a car security system, they might look at 'who', 'where', and 'why'. The typical combination for the car security system is that it is used by car owners (who), when parked and left unattended (where), for the purpose of theft prevention (why). Let's now bring into the equation two other combinations such as a satellite navigation system and a mobile telephone. Students can now begin to think creatively and design a handheld device functioning as a mobile phone which comes standard with a vehicle immobiliser security navigation system. If the car is broken into, driven away or moved, the owner is alerted, allowing them to track and immobilise the vehicle through their mobile phone. Most often creative ideas come from the most illogical combinations.

**6. Build on the ideas of others.** Students love to interact, where they fully use their imagination. This interaction can continue for hours. Interestingly, when adults congregate, such as in meetings or socially, instead of contributing, they often either criticise the previous idea, pass judgment, just agree, or do not add to the discussion or ideas presented. With little contribution and/or negativity, the process ends quickly. This is often the case in the classroom. We see all of the reasons why things will not work. In solving this, the next time students have a problem to resolve, such as the design of a good web site. Have one student cast out the first idea, and let the class continue with, "Yes, and...", building on the previous ideas. Do not allow innovation to be crushed at the beginning. Do not accept the response of "Yeah, but...". The key is to answer quickly and avoid thinking too much. Top-of-head answers tend to tap into a part of the brain we don't use during our normal thinking process. And be sure that the students' answers are a contribution, which builds on what the previous student said rather than invalidates it.

Many of the new ideas will be ineffective, but don't be concerned. Work with it, as you never know when an excellent solution to an idea will be found. Over time, this will become a normal mode of operating. Your students will become the masters of breakthrough thinking on a regular basis by building on the ideas of others.

**7. Welcome creative tension.** It is human nature to surround ourselves with people we get along with. Unfortunately our students choose who they work with through focusing on this human chemistry and students with similar competencies. This perpetuates a limited set of creative possibilities. Instead,

place students in teams with different analytical, creative, and personality styles. Welcome the creative tension. As long as the students are open to new ideas, they are bound to emerge. These team combinations can create new ideas never previously conceived.

#### CREATING A CULTURE OF INNOVATION

Through classroom challenges, tasks and projects it is good to place students in a whirl of uncertainty. These uncomfortable situations demand sharp reflexes, creative thinking and pervasive innovation. The aim is to install a mindset of continuous innovation at every level of one's teaching that will allow you to achieve and sustain fresh thinking from your students.

#### MANAGING, STIMULATING & DRIVING INNOVATION

Teachers should develop a new climate to stimulate innovation. Holding a few brainstorming sessions with a handful of students once or twice a year is inadequate. Instead you must inject innovation throughout the execution of each process, every day, by everyone. To spark innovation and deliver maximum results a teacher must look at innovation for student advantage, processes that enable innovation, create a culture of innovation, review teaching strategies and technology advancements, include innovation into assessment, target innovative students, simulate new models of learning, plan the journey, and always look to the future. From an industry point of view in today's age of unprecedented access and unlimited competition, constant change is the prerequisite for survival.

#### CONCLUSION

Teaching processes have often been thought of as static processes, as a series of instructions laid down in lesson plans and manuals to be repeated exactly the same way every time. In order for superior processes to occur, one needs to incorporate a built-in ability to thrive on change. The key to excellent teaching processes lies in the ability to inject continuous innovation into the design process. It is no longer enough to inject innovation only at the design stage, which leaves the execution as mechanical. Students in today's changing environment need to pull together critical concepts of process improvement, technology enhancement, innovation and creativity into a single framework; a holistic concept enabling students to perform optimally in activities that typically require fresh thinking. So rather than teaching what you did yesterday better, do something new today.

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