

The links between Creativity, Innovation and Entrepreneurship

A discussion paper by Dr. Gerrit Anton de Waal

First, what is creativity?

Of all people, John Cleese, English actor, comedian, writer and film producer, made a study of creativity – in particular the work of brilliant psychologist Donald MacKinnon of the seventies – and came to the conclusion that it simply cannot be explained. He likened creativity to Mozart's music or Van Gogh's painting, saying it is literally inexplicable. Still, over the past century society has learned enough about the topic from the most creative people around who, through their 'way of operating', simply acquired a facility for getting their natural creativity to function. These are the insights that can help us all to unleash our own creativity for our own benefit and for the benefit of others. In order to make sense of creativity, we shall use metaphors and simple stories. So let's kick things off with a short story...

Peter is a computer programmer by day, but on occasion he transforms into a great chef who loves to entertain his flatmates and house guests with deliciously cooked meals. One of his favourite dishes is 'mieliepap', a traditional South African porridge made from ground maize. Peter is pleased to see how much his non-South African friends are enjoying it too. Peter's girlfriend, Sakura, is Japanese and they love sushi and eat it frequently. Then one good day the idea struck Peter to make sushi with mieliepap instead of rice, and call it 'papsushi'. So he experimented with the relevant ingredients until he was satisfied that his invention was in a format that he could prepare it consistently to a high standard and offered it to visiting friends and family. To his delight they all described it as a yummy, novel delicacy. It gave him much pleasure to feed his guests papsushi, but quietly he also took much pride when they described him as an innovative chef. Sakura also loved the taste of the papsushi, but she realised Peter's invention held more potential than just its entertainment value and bragging rights. Within three months after Peter made his first papsushi, Sakura contracted an industrial kitchen to make and sell fresh batches of papsushi on a daily basis, using Peter's unique recipe, to seven food courts in their neighbourhood. The feedback she got from customers was overwhelmingly positive – people just loved it! This excited Sakura to no end. She now has big plans to grow the papsushi concept into a sizeable business.

Let's take stock of what happened here. Just like everybody else at any point in time, Peter's head is filled with lots of existing concepts, thoughts, and ideas. Let's just refer to them all as ideas floating around in his head (for convenience sake depicted outside his head as in Figure 1). The key word here is 'existing' as these ideas are not new; they have accumulated over his lifetime on a huge variety of topics through learning and experience and Peter draws on them every day as he goes about his daily routines, so they are quite useful. For example, when Peter cooks mieliepap, he uses existing ideas from a recipe he has and past experience to make something he loves to eat. So far no evidence of creativity...



Figure 1: Our heads are filled with many existing, diverse ideas

But then it suddenly happens! Two existing, but different ideas - mieliepap and sushi - 'collide and connect' in Peter's head to produce an offspring called papsushi (Figure 2). Peter refers to this incident as having had a flash of inspiration; a breakthrough in his thinking; a bright idea. Others refer to it as a moment of epiphany, 'connecting the dots', illumination, or having an Eureka moment. Many people graphically depict a creative thought by means of the clichéd light bulb that turns on.



Figure 2: Creativity in action – two ideas connecting

So it becomes clear that creativity is the production of a new idea or 'mind-concept' that is novel and potentially meaningful in a specific context. It can be described as two (or more!) existing but different ideas connecting and producing a new and unique idea. This idea must be potentially useful in some sense or have some potential value that can be exploited in one way or another for it to be classified a creative idea.

Useful and complimentary views of creativity:

- Creativity is connecting things ('connecting the dots') (Jobs, 1996).
- Creativity is the tendency [or ability] to generate or recognise ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others (Franken, 1993).
- Creativity is seeing what everyone else has seen and thinking what no one else has thought - *Albert Einstein*
- Creativity is the production of new and useful ideas in any domain - *Theresa Amabile*
- It is a way of operating – *John Cleese*
- It is connecting two separate ideas in a way that create new meaning – *John Cleese*
- A moment, a moment where we look at the ordinary but see the extraordinary – *Dewitt Jones*

The links between creativity, innovation and entrepreneurship

In Peter's case the mind-concept of papsushi was his creative idea and fortunately for him and others he acted on the idea and produced something (in this case, something tangible) that people could admire. We refer to this activity – turning a novel idea into reality, as innovation. In this particular case Peter came up with a detailed and proven recipe which he and others could replicate to produce and enjoyable meal. Had Peter decided to abandon the papsushi idea or simply never acted on it, his creative idea would soon be forgotten and be of no benefit to anybody. Unfortunately, this is the fate of millions of creative ideas each day (Figure 3). Creative ideas have a high fatality rate as people tend not to act on them, for a variety of reasons. (Watch this short video clip on procrastination: https://adsoftheworld.com/media/tv/hsbc_museum_of_procrastination).



Figure 3: The untimely fate of many creative ideas

Fortunately, Peter turned his novel idea into a reality by demonstrating that his innovation was technically feasible and that a small number of people actually liked it (early indications of customer validation). At this stage everybody would agree his recipe held some potential value. But it was only with the help of an entrepreneur when market and financial feasibility were established and actual value resulted from the innovation.

Sakura showed that papsushi can be produced and sold to a sizeable market at a profit. This is entrepreneurship in action. Sakura, the entrepreneur, took Peter's innovation and in the first instance commercialised it (prepared it into a format that was producible and saleable) and followed that up with market exploitation (simply put, sales). She noticed its potential value and exploited the opportunity to realise actual value – in this case, financial value. However, the realised value need not always be in financial terms; it can be in social or cultural terms too. Simply stated, an innovation's potential value is realised once it is implemented among a user or customer group and reaping benefits for one or more of its stakeholders. Creativity often plays a big part in each of the phases of realising value from an idea, as depicted in Figure 4 below. In the context of business startups, coming up with a great idea arguably requires the smallest amount of creativity; much more creative input is required for developing the actual innovation while heaps of creativity is needed to devise an effective business model to optimise sales and profits.

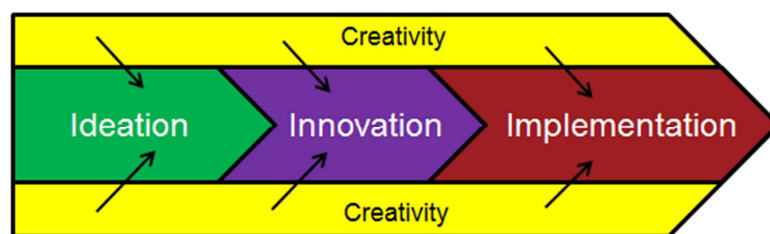


Figure 4: Creativity's influence on ideation, innovation and implementation

Innovation can happen in any realm, whether it is in the visual arts, literature, technology, the business environment, or in any aspect of daily life, such as problem solving. Table 1 shows some examples of different types of innovators with their corresponding innovations.

Table 1: Examples of innovation manifestation and implementation

Type of innovator	Innovation manifestations (having potential value)	Examples of innovation implementation / value realisation*
Artist	Artwork (e.g. painting, sculpture)	Art exhibition
Engineer	Improved product (product innovation); invention	Commercialisation and Exploitation (Sales)
Scientist	New knowledge (e.g. formula); Discovery (e.g. gravity, antibiotics)	Dissemination (e.g. journal publication) and Application
Chef	Recipe; dish	Available on restaurant menu
Designer	Visual rendition	Chosen in final product design

Problem solver	Potential solution	Implemented solution
Musician	Musical composition	Concert, released album
Director	Movie; stage play	Box office release
Author	Written manuscript	Published book
Business person	Business model	Launch of start-up business
Corporate entrepreneur	New or improved work process	Institutionalisation

* Alternative descriptions for innovation implementation include: innovation being brought into use; innovation application; innovation exploitation; innovation actualisation

The artist, for example, already makes the connections of her artwork in her head and visualises the shapes and colours her objects are going to assume (creativity) before committing her brush to canvas, before making the millions of connections between pixels of different colours on her canvas (innovation).

Realising the value of an innovation deserves some clarification. For some types of innovation, such as an improved business process, this could be a fairly simple task. All that might be required to implement a particular innovation is for a manager to authorise a report which details the specific performance improvements and resulting performance gains, before the process is implemented company-wide.

For other types of innovation, such as in New Product Development (NPD), value realisation typically spans many more activities. In this case the innovation is a newly designed product or an invention, perhaps in the form of a final prototype that has gone through several stages of development. The process for realising its value has two stages. It starts with commercialisation, that part of the product development process that typically establishes the production process for the new product and plans for quality assurance, marketing, distribution and training to get the product ready for launch, often referred to as market readiness. Commercialisation ends with the start of the exploitation stage, the moment the firm officially launches the product into the market for mainstream sales, including a variety of activities to achieve sales.

The dual nature of innovation

Innovation is both a **PROCESS** **and** an **OUTCOME**.

Useful and complimentary views of innovation as a **PROCESS**:

- Innovation is the act of turning new and imaginative ideas into reality (unknown)
- Innovation is the production or adoption, assimilation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems (adapted from Crossan and Apaydin (2009))
- Innovation is the act of creating a new product or process. The act includes invention as well as the work required to bring an idea or concept into final form (The Product Development and Management Association)

In its simplest form, innovation as a **PROCESS** can be described as follows:

Innovation is change that adds potential value.

Useful and complimentary views of innovation as an **OUTCOME**:

- An innovation is a potential or partial solution to a problem
- An innovation is an opportunity awaiting exploitation
- An innovation is an improvement of something

In its simplest form, innovation as an **OUTCOME** can be described as follows:

An **innovation** is a novel concept, physical or intangible, that has potential value.

Creativity, invention and innovation share a common denominator – ‘newness’. Ideally an innovation or invention would add value in some form or another, but unfortunately this is not always the case.

An **invention** is the creation of something new that was not previously in existence. It is therefore a special kind of innovation in the sense that it is not just an improvement of something that already exists.

From experience we know that many innovations and inventions never make it into the marketplace. Publicly available patent databases describe numerous patents that are utterly useless and have never found application in the real world. Hence continued reference to ‘potential value’ when we define innovation. Each of the examples below holds the potential to bring about meaningful change, if only in a very small way, but unless a ‘champion’ is found to ‘take it to the market’ the actual value has not been proven or exploited (in a positive sense).

- Artwork must find an appreciative audience, perhaps with the help of a curator;
- Inventions are useless if they don't find meaningful application through successful commercialisation and exploitation by an entrepreneur;
- New knowledge must be disseminated via peer-reviewed means into the public domain for it to contribute to the advancement of society;
- A proven solution needs to be successfully implemented by a manager.

As the examples show, creativity that leads to ideation can be seen as the front end of a process that could result in an innovation. One innovation may consist of a single or several creative building blocks. The papsushi innovation, for example, had two creative aspects to it – the actual recipe and the new name describing it. You can have creativity without innovation, but you cannot have innovation without creativity. Similarly, you can have innovation without implementation. This might occur when no effort is made to realise the potential value of an innovation, such as in university environments where engineers and scientists are often only interested in developing and proving a new concept before they move on to the next challenge; they often have no aspirations for commercialising and launching their innovations in the marketplace. For any type of innovation a champion is required to realise its potential among customers, end-users or people who can benefit from it. Sometimes the innovator and the champion can be the same person, but often it is not, as was the case with Peter and Sakura. Innovators and champions typically possess different sets of skills and natural ability; hence entrepreneurship tends to be a team sport – you need people with different and complementing skills to successfully pull it off. Another reason for non-implementation is when it becomes obvious very quickly that an innovation does not have sufficient potential value – i.e. the innovation's feasibility breaks down in one or more of the areas of technical (e.g. it does not always work as intended), market (e.g. not enough people will buy it) or financial (e.g. it cannot be sold at a profit).

Innovation is not ...

Innovation does not include market implementation

Some people view innovation broadly as consisting of both the manifestation of a creative idea and its implementation, which is not only conceptually incorrect, but fails to contribute to the understanding and management of innovation. Below I provide a few reasons why it is important to distinguish between an innovation and its implementation.

1) Innovation is derived from a number of Latin words for which The Etymology Dictionary provides the following meanings:

- **innovatus** (v.) "introduce as new", 1540s, past participle of innovare "to renew, restore; to change," from in- "into" + novus "new".

- **novate** (v.) “to replace by something new” 1610s, from past participle stem of Latin novare “to make new” from novus “new”
- **novation** (n.) “replacement of an old obligation by a new one” 1530s, from Latin novationem (nominative novatio) “a making new, renewal,” noun of action from past participle stem of novare “make new” from novus “new”.

Innovation can therefore be seen as both the renewal of something that exists and something completely new (invention). Nowhere in these original explanations is any mention or suggestion being made to the act of implementation or exploitation.

2) In practice the all-encompassing (incorrect) view of innovation (developing something new and taking it to the market) inadvertently leads to more emphasis being placed on the creative first part than the implementation part. The latter activity is arguably the more important of the two activities, for as it has been shown, if there is no implementation the innovation effectively becomes obsolete. In Australia, and elsewhere, governments urge companies to improve their innovation efforts, but less emphasis are placed on taking those innovations to market – which is entrepreneurialism. Instead, by treating the two activities as separate entities as one should do, managers are more likely to provide both the attention they deserve. Yes, do your best to come up with new innovation, but doing that is only half the game! The other very important half is to let people benefit from it; don't hide it under your bed.

3) The activities that comprise innovation and implementation are vastly different and often involve different actors with different skills sets and management approaches. These two entities are too different to be categorised as one.

It is therefore very important to distinguish between innovation and implementation to ensure that both receive the attention they deserve.

Why creativity and innovation are important

People in many walks of life rely on creativity to help them do their jobs. Just imagine what a writer of novels or a design engineer would do without creative ability. The writer would have what we refer to as ‘writer's block’ and the engineer would be without a job in no time. People also use creativity in non-professional environments to solve problems or get out of difficult situations. Just think of TV action hero McGyver who used his creative genius to escape from life-threatening situations in each episode. What a boring place earth would be if it was not for creative and innovative people? We would still be living in caves without fire and smartphones. Do you rely on creativity in your daily life, or do you get by without it?

Once people believed that creative ability is something that sets the human race apart from animals, but many examples have since come to light of animals being extremely creative in the way they go

about feeding themselves. The black-crowned night heron, for example, throws bait on the water to attract little fish so they can be within easy reach for a catch (<https://www.youtube.com/watch?v=jqlv-ZVIhu8>), and sea otters, while floating on their backs in water, use small flat rocks that they place on their tummies to break open clams (<https://www.youtube.com/watch?v=Uc7Ahp5-eE>). If even animals see a need for creativity, surely we as humans can benefit from it one way or another?

An entrepreneur is a person who habitually creates and innovates to build something of recognised value around perceived opportunities – (Bolton & Thompson, 2002)

Creativity and innovation are the main tools of entrepreneurs. According to Bolton and Thompson (2002), an entrepreneur is a person who habitually creates and innovates to build something of recognised value around perceived opportunities. Without creativity and innovation they would only be able to launch ‘me-too’ businesses – businesses that simply resemble other existing businesses and where success mostly depends on effective implementation. Experienced entrepreneurs know that they need creativity almost on a daily basis to adapt their business models because of changes in the competitive environment, for devising attention-grabbing promotions to sell their products and appropriate tactics for overcoming the numerous hurdles that threaten their survival. Coming up with the initial bright business idea is definitely the easy part of launching a new business, with later stages demanding a lot of creative thinking.

Where does creativity come from?

Creative ideas come from individuals, but from what sources do they draw their ideas? I ask this question because if we know the answers perhaps we can better utilise these sources in the hope of increasing the frequency and quality of ideas. There appears to be five potential sources (Lumsdaine & Binks, 2006) which I discuss next.

1) Divine inspiration: Whether religious or not, some music and pieces of art make one wonder if, as ancient and romantic theories might have it, it was not perhaps handed down by the gods instead of having been created by mere mortal souls. For me Metallica’s *Nothing else matters* falls in this category; for others it might be Bach’s famous work *The Well-Tempered Clavier*. Some believe divine inspiration is obtained from getting high on drugs or through “higher-order” thinking. I won’t pursue or recommend such approaches here.

2) Necessity: Creative thoughts that spring into existence when a person or persons find themselves in difficult or challenging situations are forced in order to solve pressing problems, sometimes even to save themselves from physical harm. McGyver’s quick and ingenious thinking is an example of creativity that draws from strong determinism to avoid negative consequences.

3) Serendipity and preparedness: Here creativity is seen as happening by chance or accident with no apparent cause (fortuitous happenstance), unexpectedly, often suddenly, such as Peter's papsushi idea. Was Peter's idea just plain luck? I will argue not, for Peter often experimented with different foods and recipes and he was interested in foods from other cultures. It is highly unlikely that his papsushi idea would have been thought up by a person who never cooks or has no interest in food other than from his/her own background. At the same time I do not deny that in some amazing breakthroughs in science luck appears to have played a significant part, for example the discovery of a new antibiotic by Dr. Michael Zaslov in 1987. For several years he went through the same daily routine of partially dissecting frogs, then returning them while still alive to their highly septic containment overnight, just to continue dissecting them the next day. Zaslov, just like thousands of others following the exact same procedure, never thought it strange that the frogs were still alive and never got infected. Until one day of course when the penny dropped and he discovered a new antibiotic. At the time newspapers heralded his breakthrough as "another instance of serendipity." However, one could also argue that Zaslov did a few things right that day: he was in the right place at the right time and for a change he was observant. Had he been unemployed, or just going through the motions while dissecting the frogs as was his usual practice, the breakthrough would not have occurred. It appears that creative thoughts tend to favour those 'prepared' minds. This tendency shows up in other aspects of life too. Once a sports journalist made the comment that PGA golf champion Gary Player seems to be very lucky with the number of holes-in-one that he's hit over the years. Gary's response was that yes he was lucky, but it also appeared to him that the more he practiced, the luckier he became.

4) Learning processes for creativity: This form of creativity in action appears to take place more gradually over a period of time and the epiphany moments may not be as well defined or as noticeable as is the case with serendipity (sudden) creativity. Darwin's theory of evolution is a prime example of the former type as it emerged and evolved over a period of time spanning several years. It would be very difficult for him to pinpoint one specific moment in time when the concept of natural selection first dawned on him. Instead, this breakthrough in thinking and understanding took place as a consequence of sustained inquiry into related phenomena. Other learning processes, such as implementing creativity tools and problem solving methodologies, have much shorter timeframes of execution during which high levels of creativity can be achieved. Examples are brainstorming and morphological analysis, tools that respectively draw on the collective creative ability of groups and specific creativity prompts for generating a multitude of creative options for a specified context. Design Thinking is a very effective approach to problem solving and its application, typically over a period of weeks rather than months, is known to yield both creative and optimal solutions to difficult problems.

5) Environments conducive to creativity: When a systematic approach is followed to identify those external and extrinsic factors that enhance creativity and make them available in an environment where creativity is encouraged, chances are people frequenting that environment will be

more creative. Creative behaviour seems to become second nature among people working in such environments. Many innovative companies such as Google and Apple have realised the value of this highly controllable factor and are no doubt reaping the benefits.

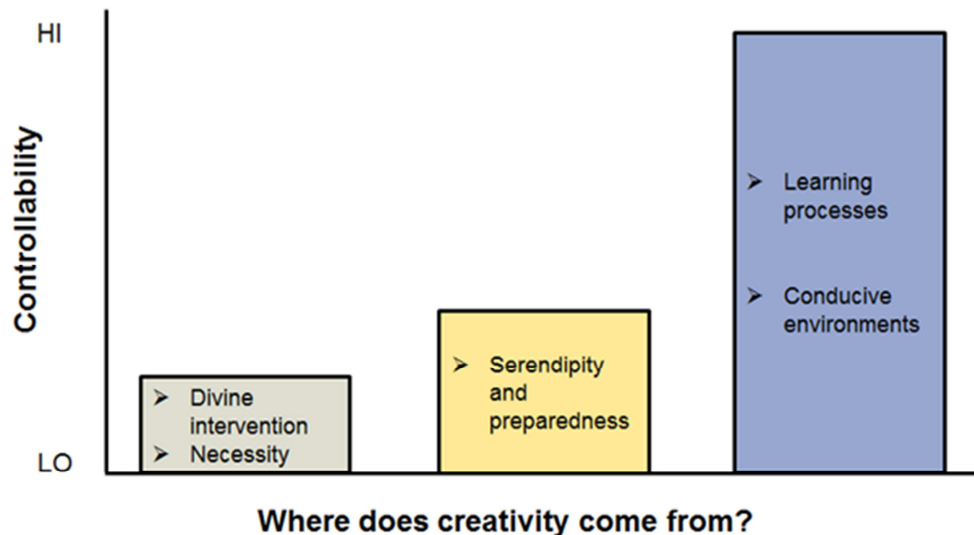


Figure 5: Creativity's origins versus controllability

Learning processes for and environments conducive to creativity (see Figure 5) are by far the two factors that are under most control of people, whether it be an individual who wishes to become a more creative person, or the management team of an organisation that wishes to promote creative behaviour in the workforce. Tapping into serendipity and preparedness creativity is definitely something that individuals could 'practice' on a daily basis. The decision to do so is very dependent on individuals; hence the total control over this source is seen to be medium compared to the others. Divine inspiration as a source of creativity scores very low on controllability by both individuals and management teams.

This discussion on controllability of the sources of creativity helps us understand where best to focus our efforts to enhance and unleash our personal creativity. Or, if you are a manager who wants to develop this quality in the people that work in your organisation, this knowledge would also be of help.

Is creativity a process?

Some scholars, such as Wallas (1926), view creativity as a process that can be followed in a more or less linear way that will eventually yield some creative outcome:

1. Preparation – stage in which the problem is investigated
2. Incubation – stage in which the problem is thought about sub-consciously
3. Illumination – stage in which ideas come together to form a possible solution
4. Verification – stage in which result is evaluated and deemed acceptable

I would argue that creativity really only constitutes stage 3 (above) and that it does not constitute a process. As discussed before, the collision of ideas can happen in a moment – in which case it doesn't make sense to talk about a stage - or gradually eventuates over a period of time. By suggesting that innovation is a process, scholars suggest that one should follow a specific linear sequence of events and that creative output will result from that. Baking a cake is a process that has distinct sequential steps and when followed, will result in a cake (unless I'm the chef). Creative output, on the other hand, is never guaranteed. The best one could do is to condition yourself and your environment for creativity, and hope for the best. Supporting my view that creativity is not a process, is again the example of the papsushi idea. Clearly Peter did not follow Wallace's four-stage process as he clearly did not have a problem to start off with.

Which brings us to the next important point. Creativity should not be confused with so-called creative problem solving processes, such as Design Thinking, or Wallas' model above. Design Thinking constitutes an iterative process in which a variety of tools and techniques are employed to aid creativity. In essence, it suggests certain conditions that the problem solver must emulate and if done effectively, are likely to yield creative solutions to problems that users or customers actually want.

To summarise: In Wallas' model creativity is really only the illumination stage where ideas come together to produce something novel. In the previous sections I went to great length to explain that creativity happens when a novel and useful idea is born. This can happen seemingly instantaneously, or over a period of time when some ideas gel together to form a new way of thinking. To have any chance of success for this to happen, one needs to condition oneself for creative behaviour; put oneself in the right mind-set and an environment conducive to creativity. Preparation (Wallas Stage 1) and Incubation (Wallas Stage 2) are only two examples of such conditioning, but there are many others which I discuss in what follows. The required behaviour, once established, is ongoing and becomes habitual. If this behaviour was previously non-existent, there are many actions one can take for putting it in place, but once in place, it becomes a way of living – it certainly does not resemble a process.

Conditioning for creative behaviour

To help us understand the concept of conditioning for creativity, let's use the analogy of a melting pot. Visualise a melting pot (Figure 6) into which you can pour and mix any number of ingredients which cause the heterogeneous elements "melting together" into a harmonious whole that becomes a tasty broth.



Figure 6: A melting pot of creativity ingredients

What are the ingredients?

As each situation in need of a creative outcome is different, there could be no specific recipe or process for achieving it. We are all unique and our melting pots will also be unique. In a sense you become a witch doctor who reverts to your 'magic potion' when the situation calls for it. Trust your melting pot and keep adding the ingredients as you discover them, and you will be surprised what beautiful flavours spring from it every day for the rest of your life. Here are some ingredients that you can try for yourself, in no particular order.

AWARENESS / BEING OBSERVANT

It is highly unlikely that you will become creative in a particular discipline if you are not first aware of that discipline. Try and become aware of your environment, of what's happening in it. Being glued to the screen of your mobile device will make you aware of what's inside it, but not necessarily what's on the outside. A good way to increase awareness is to use all five your senses: sight, smell, hearing, taste and touch (Figure 7). Really connect with it. How often are we guilty of seeing but not seeing; tasting but not tasting, etc.? Going hand-in-hand with being connected to your physical senses, is mental alertness. It means you have to be observant; be 'awake'; be present in the moment to expect the unexpected. When they do present themselves, those Eureka moments may easily go unnoticed. Opportunity knocks on everybody's door, but very few people are 'home' to open the door before it leaves. As somebody said, opportunity whispers, it does not shout. Remember that Zaslov's breakthrough only came after a decade's unobserved Eureka moments by him and many other researchers dissecting frogs.

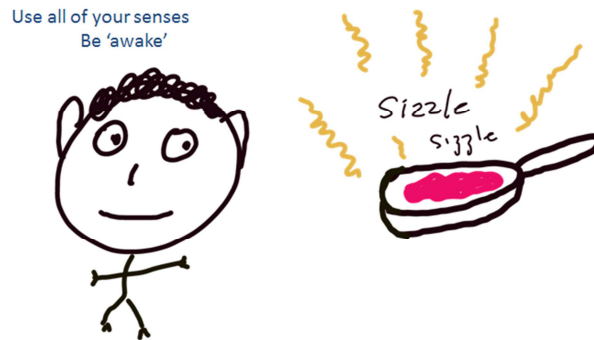


Figure 7: Awareness – connecting with all your senses

INTEREST

How often do you hear somebody say “it does not interest me”? The biggest reason for this is that people who say so are not prepared to put in a little effort to get to know more about a particular subject. Haven’t we all experienced the fact that the more we know about something, the more interested we become in the topic? It really is a snowball effect; the more effort we put in the more we become interested in something and the more interests we develop over time (and the more interesting we become as people). The more diverse interests we have, the more ideas are ‘floating’ in our heads and the greater the chance that two or more non-related ideas will collide to produce that next great idea.

MOTIVATION

Motivation, intrinsic or extrinsic, is a powerful force that drives you to be successful in what you do and be rewarded for your achievements. What is your motivation to be creative in a specific context? If you lack any such motivation you probably won’t put in the required effort and your results may be disappointing.

PASSION

Arguably, becoming **passionate** about anything is something that either happens by itself, or it does not happen. One cannot force this; hence it is an ‘optional’ ingredient, but a very powerful and desirable one. Imagine what happens when you heat up the air particles inside a container. The particles start moving faster and many more collisions occur than when the air is cold inside. Passion has the same effect on creativity; it ‘heats’ up the ideas inside our heads and act as a stimulant for creativity.

IMAGINATION

Close your eyes for a few moments and think about your next holiday. What do you ‘see’? You probably see images of yourself on the beach with the wave in the background; mental images that are created by your imagination. Arguably they are not real, or are they? Some of us mostly visualise ‘modest’ images (Figure 8), while others are able to see ‘wild’ and complex images. The latter group

of people are often 'blamed' for 'having big imaginations'. Children sometimes imagine ghosts live under their beds, and adults simply make it off by saying "don't worry; it is just your imagination".

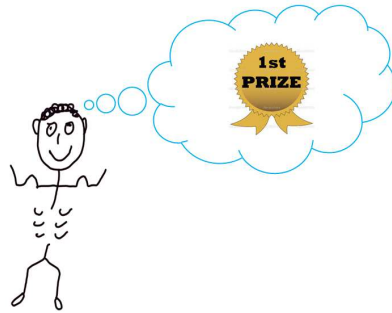
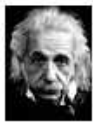


Figure 8: Imagination is useful to being creative

Imagination is an essential ingredient for creativity as it is the imagination that allows for the conceptualisation of new ideas and approaches within the human brain; giving 'mental form' to thoughts and ideas. If the idea is the skeleton, then imagination is the flesh. Without it we would only be able to perceive in our minds what is conveyed through reality by means of our senses such as sight and hearing. How much poorer would life be without this amazing resource? Although imagination is generally considered to relate to fiction, it often leads to many real and material outcomes (Brann, 1991), so it is of great importance to mankind.



"Imagination is more important than knowledge. For knowledge is limited to all we now know and understand, while imagination embraces the entire world, and all there ever will be to know and understand."

All of this is fine and makes some sense, but is it possible to explain the link between imagination and creativity a bit better? Scientists and artists typically operate from a basis of knowledge in creating new knowledge or works of art. However, because of the abundance of available information and time constraints they often do not progress to the next step in a deductive (logical) way, but first use imagination inductively to envisage how certain knowledge combinations or artistic principles (mental observations) could achieve desired outcomes, then experiment (innovate) to verify or nullify the hypothesis. Thus imagination is used as a cognitive manipulative tool for achieving creative outcomes or breakthroughs (Kant, 1987[1790]). In the same manner everyday people can use imagination to envisage the potential elements of a creative solution to a particular problem and consider its likelihood of success before putting it to the test. There normally is not enough time or resources to test every possible combination. Because imagination as a source is unlimited, free to use and without boundaries, it is the ideal tool to assist with creative thought. The following tale demonstrates the use of imagination in creative problem solving.

A farmer's goat fell into an empty well and no help was at hand. The animal cried piteously for hours as the farmer tried to figure out what to do. His mind raced through many possibilities, quickly discarding each as unfeasible before moving to the next. He imagined his goat acting like one of the superheroes on TV, pushing with his back against one side while pushing with his feet on the other side, slowly wriggling himself upwards. The problem is his goat was no supergoat, so he let go of this thought. Next he imagined his goat floating like a duck on water, but then his goat wasn't a duck and there was no water around to fill the well to the top and make the goat buoyant. Idea abandoned. The next image that appeared was that of a volcano erupting underneath the goat and spewing him out of the well into the open. But the earth was very unlikely to move, or was it? Could the farmer make the earth move? Maybe not like in the way a volcano would, but the farmer had a spade and there was plenty of soil around... Eureka! The farmer started filling the well with earth, one spade at a time, and as he continued to shovel dirt on top of the animal, the goat would shake it off and take a step upwards until he could reach for the surface and escape. The farmer used his imagination to visualise a variety of possible scenarios and manipulate constructs, before eventually hitting the creativity jackpot when two different ideas collided and evolved into a feasible solution. Don't you just love stories with happy endings?

In our tale of the goat the farmer used inductive thought to imagine a desired outcome (a volcano erupting underneath the goat), then innovated a feasible solution backwards to where the goat found itself still trapped in the well.

You can form mental images of something (imagination) without it leading to creative thoughts, but you cannot have creativity without imagination. Would you agree with this?

Do you still use your imagination, or is it something that only children do? For what purposes do you use your imagination? How often do you use your imagination? How good is your imagination? When was the last time that you used your imagination in your work situation?

SPACE-TIME-OASIS

John Cleese, English actor, comedian, writer and film producer, brilliantly introduced the concept of a space-time-oasis in a 1991 speech to Video Arts, which unfortunately has been removed from YouTube because of copyright issues. Vimeo is currently hosting this [video](#), but I'm unsure for how much longer it will be available. You can obtain your own (costly) copy from Videoarts, but failing that, an unofficial transcript of John's speech is [here](#).

Leading up to his idea of a space-time oasis, Cleese distinguishes between the 'open' and 'closed' modes of operating. Most of us, in daily life, find ourselves in the closed mode in which creativity is not possible.

Closed mode	Open mode
Most of the time at work; lots to be done; semi-anxious; a little bit impatient; purposeful; can become stressful; pushing things; no creativity; Convergent thinking	Relaxed; expansive; less purposeful; more humour; more playful; curiosity exist for its own sake; more contemplative; no pressure; Divergent thinking

To give creativity a better chance, each of us should attempt to find a personal space-time-oasis that meets five conditions:

1. **Space** – a physical space where you can seal yourself off from demands and distractions; where you can 'operate' uninterruptedly in 'open' mode.
2. **Time** – a specific period of time that you allocate for being in your space-time oasis each week; ideally one-and-a-half hours. It must have a specific start and end time. The first half hour is used for quietening yourself down; getting yourself into 'open' mode, while the rest of the time is spent with you 'resting your mind against the subject' that requires your creative thoughts.
3. **Time** – here time is considered in a different context from point 2. It refers to how 'creative' time should be used. The principle here is that the most creative people apparently 'play' with problems longer before they try and solve it. Not only are they not afraid to spend more time understanding the problem before they start solving it, but they also don't just jump at the first solution that presents itself. They take their time to consider more possible solutions and as a result often deliver more creative solutions than otherwise.
4. **Confidence** – One should have absolutely no fear of making mistakes within this oasis; anything goes. A sense of playfulness must prevail where one feels safe and free from judgement.
5. **Humour** – humour has the ability to change the mode from 'closed' to 'open' faster than anything else, and as it is an essential part of playfulness and creativity, one should maintain a light-hearted atmosphere within this environment as opposed to solemnity. The technical reason behind the power of humour is that when you are in a happy state of mind the brain releases a chemical called Dopamine in the frontal lobe which controls the flow of information to other parts of brain, thus opening up connections between concepts.

How many of us can honestly say that we enjoy the luxury of such space-time oasis? Is it within our reach, or not? Is it possible to separate ourselves from our electronic devices for the said amount of time each week? Only you can answer the question for yourself.

INCUBATION AND ILLUMINATION



Figure 9: Incubation... don't underestimate its value in creativity

Many view incubation (Figure 9) as a stage in the creative process, but we have already established that creativity is not a process (creative problem solving is) and I want to stress here that the phenomenon of incubation is not a stage which suggests it has a beginning and an end. Incubation is a particular mind-set that one aims to achieve on a daily basis where conscious thought about the area that you are working in or the problem you are trying to solve is purposely halted. Incubation could also occur while you sleep. During this break the unconscious mind takes over and recombines previously stimulated thought elements in novel ideas that appear at some later unknown point in time when illumination occurs. When people face tough decisions they often comment that they will “sleep on it”, suggesting that they will hand it over to the unconscious mind to incubate what is hopefully the best solution. Illumination is not guaranteed to happen, but when it does happen can occur at any time. When it does, it appears to “come out of the blue”, and can happen anywhere. ‘Popular’ places seem to be in the shower, in front of the TV, on the sports field or in bed while waking up in the morning. These places tend to open one’s mind and allow it to wander more freely.

Techniques for enhancing the effectiveness of incubation include uninterrupted mental relaxation, meditation, putting the problem aside for a period of time, thinking about something else for a while, ‘sleeping on it’, or engaging in playful activity. Incubation is useful for both general creativity and creative problem solving, and should be ‘practiced’ on a daily basis.

In 1845 Elias Howe, inventor of the sewing machine, worked for many months unsuccessfully trying to crack the now familiar lock-stitch mechanism. Then one night he had a dream, or rather a nightmare, during which cannibals captured and tortured him by thrusting spears into his flesh. While being poked in his dream, he noticed that each spear had a hole in the tip. This was his "Eureka!" moment that led him, when he happily awoke from the dream, to put a hole in the tip of the needle in his sewing machine, and the rest is history.



CREATIVITY PLAYMATES

John Cleese suggests it's easier to be creative if you've got other people to 'play' with, on condition that your play friends are people you like and trust. Such people are useful for throwing ideas backwards and forwards, helping you to refine your ideas, and possibly attain more creative outcomes than otherwise.

NEW EXPERIENCES OUTSIDE YOUR COMFORT ZONE

Scientific research supports the fact that engaging in new experiences outside your comfort zone harnesses one's creativity (Andriopoulos & Gotsi, 2002). Entrepreneurs are not known for playing it safe, so putting yourself in new and challenging situations is a good way to get used to an environment where you can see things in different ways and learn to cope with the fear of failure.

The comfort zone is the great enemy to creativity; moving beyond it necessitates intuition, which in turn configures new perspectives and conquers fears - Dan Stevens

Comfort zones differ from person to person, so find something that you know will challenge you. For some it will be public speaking, while for others it might be bungee jumping, skydiving, or handling snakes. Have fun but take care!

CREATIVITY AND INNOVATION TOOLS

Tools are any structured aids, managerial or technical in nature, which innovators and entrepreneurs use to improve their creativity and innovation efforts. Just like a tradesperson, you should keep and

maintain your personal toolbox and know when and how to use each tool. As you will be introduced to a variety of tools over the course of your study, it is perhaps a good idea to keep an inventory of the ones in your toolbox. Follow this link <http://www.innovation-portal.info/toolkits/browse-tools-by-category/?sort=az> for a useful list of creativity and innovation tools.

At the simplest level a tool is something which helps get a job done — but it is not a substitute for the person doing the job. It can be extremely simple — a back of the envelope checklist of questions to ask — or it can be a formally structured, computer based aid to analysis. But in essence it is still something which can be used to help get something done. We can apply such tools to the problems of helping with innovation and design in companies. (Tidd, Bessant, & Pavitt, 2007)

PERSPIRATION

Finally, to produce creative output, one must put in the hard work and be under no illusion that results will come easy. As they say success is 99% perspiration and 1% inspiration.

Conclusion

The above factors do not necessarily constitute a process for creativity; they merely provide some actionable constructs that lay the foundations on which to build a life of creative behaviour. These are some, but not all, of the ingredients that may eventually contribute towards creativity and innovation.

References

- Andriopoulos, C., & Gotsi, M. (2002). Lessons from a creative culture. *Design Management Journal*, 13(2), 57–63.
- Bolton, B. K., & Thompson, J. L. (2002). *The Entrepreneur in Focus: Achieve Your Potential*. United Kingdom: Thomson Learning.
- Brann, E. T. (1991). *The World of the Imagination*: Rowman & Littlefield Publishers.
- Crossan, M. M., & Apaydin, M. (2009). A Multi-Dimensional Framework of Organizational Innovation: A Systematic Review of the Literature. *Journal of Management Studies*, 47(6), 1154–1191.
- Franken, R. E. (1993). *Human Motivation* (3rd ed.).
- Jobs, S. (1996, 1 March 2016) *Steve Jobs: The next insanely great thing*/Interviewer: G. Wolf. WIRED.
- Kant, I. (1987[1790]). *Critique of Judgment*. Indianapolis: Hackett.
- Lumsdaine, E., & Binks, M. (2006). *Entrepreneurship from Creativity to Innovation: Effective Thinking Skills for a Changing World*. Canada: Trafford Publishing.
- Tidd, J., Bessant, J., & Pavitt, K. (2007). Innovation Management Toolbox. Retrieved 25 May 2007, from <http://www.wiley.co.uk/wileychi/innovate/website/index.htm>
- Wallas, G. (1926). *The Art of Thought*. New York: Harcourt.