

**DISTINCTIVE CREATIVITY ENDEAVOUR MODEL FOR CREATIVE
THINKING: AN EXPANSION OF OSBORN-PARNES CREATIVE PROBLEM
SOLVING APPROACH**

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ABSTRACT

The research was borne from the notion that for creativity to flourish within a work environment that is constantly faced with pressure to perform and meet the challenges of the highly competitive business environment, employees need to be equipped with the necessary knowledge and skills to solve problems effectively as well as creatively as opposed to freedom from pressure. The need for acquiring skills pertaining to pressure threshold realisation as well as creative inspiration is necessary to access one's preconscious level where active creativity lies. Many of the Creative Problem Solving (CPS) models seem not to take these two highly crucial elements into consideration and the Distinctive Creativity Endeavour (DCE) Model proposes an alternative. A comprehensive model was developed by enhancing upon the much acclaimed Osborn-Parnes CPS approach by incorporating those two new elements into the model and subsequently testing the model via an experimental approach. The Creativity Index (CI) scores revealed that the DCE test group was most effective in bringing about overall creativity with an approximate of 48% increase after exposure to the principles of the DCE Model. When the two additional elements of pressure threshold realisation and creative inspiration were introduced separately via the CPS + Pressure Threshold Realisation (CPSP) and CPS + Inspiration (CPSI) programs respectively, the percentage increase was only about 15% each. Combining results of the two programs where the two factors are independent in each of the program it amounts to only 30% which is lower compared to having both factors combined together as with the DCE program. As such, we can conclude that there is a cumulative effect when both those elements are present together.

1.0 INTRODUCTION

The research takes after the much acclaimed Osborn-Parnes Creative CPS model and combines two highly important and critical factors within the broad framework of creative thinking which are pressure threshold realization and inspiration and has important theoretical and practical implications for creativity at the workplace.

Today, with the advent of globalisation and mounting competition, the most sought after executive, manager, CEO or entrepreneur is not the most knowledgeable but the most creative. Technology via computers has virtually covered all the aspect of data storage, analysis, and memory. But one crucial criterion that will determine success or failure of an executive, manager or CEO is his or her creative vision (Nakamura, 2001). A source for

creative performance and innovation in an organisation lies upon its employees and the difficult task of coming out with a unique yet effective idea that would virtually turn a company around is what makes an employee outstanding among the rest (Cummings & Oldham, 1997; Swailes, 2000; Kratzer *et al.*, 2004). Creativity is important at the individual level, societal as well as at the economic level, and individuals, organizations and societies need to adapt to the vast changing demands in order to remain competitive (Sternberg & Lubart, 1999). Even the legal profession is in dire need for creativity and innovation as there is a need of reform and repair within the profession to remain dynamic (Tunney, 2000).

Schumpeter (1942) remarked that the same process of industrial mutation that revolutionises the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This was also supported by Alan Greenspan (1999) when he described the American economy was in the midst of a continuous process by which emerging technologies push out the old. It is this dynamism of a capitalist system, which allows the maximisation of output and creating total wealth over time (Taylor, 2002). As such, the main stimulus to economic development in Schumpeter's viewpoint is creativity and innovation (Elliott, 1983). Schumpeter also defined innovation as being at the heart of the entrepreneurial role that is the linkage between new ideas and markets (Leede & Looise, 2005).

Schumpeter (1942) posits that creativity and innovation is the impetus for competition and capitalist change ...

.....“it is still competition within a rigid pattern of invariant conditions methods of production and forms of industrial organisation in particular, that practically monopolises attention. But in capitalist reality as distinguished from its textbook picture, it is not that kind of competition which counts but the competition from the new commodity, the new technology, the new source of supply, the new organisation; competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives. This kind of competition is as much more effective than the other as a bombardment is in comparison with forcing a door, and so much more important that it becomes a matter of comparative indifference whether competition in the ordinary sense functions more or less promptly....”.

The vast array of approaches set out in inculcating and nurturing creativity is based on the spirit of being pressure and stress free. This approach to creativity seems to be in retrospect to actual conditions of any work situation and more so those faced by imminent creators since time immemorial. Most were faced with a totally new and insurmountable challenge or problem if it may be deem so and seek a solution to it. They had worked under extreme pressure to secure a practical solution and often experience a sense of creative illumination when the idea emerges. Many had reported to be inspired by the ruse or something they personally feel helps in bringing out that creative spirit in them. As such, training an individual based on the principles of creativity which excludes pressure realization seems to be unrealistic to actual creative performance once one is back at the workplace, which is often riddled with various facets of pressure. This it is a pertinent to develop a comprehensive model for creative development taking into account elements of pressure as well as inspiration in developing and realizing the creative potential in each individual.

This is due to the fact that certain conditions of pressure should be encouraged in the teaching and the development of an individual as it can be transformed into positive creative experiences that could be highly beneficial to the particular individual (Senyshyn, 1999).

Most creative thinking models are built on the foundation that pressure impedes creativity and should be avoided at all cost. However, it need be understood that all work environment are not stress and pressure free, and as such acquiring the principles of creativity which are based on such an approach would be totally ineffective once back at the workplace. Owing to that, this research, which aims to develop a creativity model based on these precepts, seems timely.

Owing to this, the research was formed to attain the objectives of whether there is a relationship between pressure threshold realization and inspiration on creative development.

2.0 PROBLEM SOLVING VIEW OF CREATIVITY

Gardner's (1989) stand on creativity is linked directly to problem solving in a particular domain. Newell *et al.* (1962) defined creative activity as novelty, originality, persistence and the level of difficulty that characterise a unique class of problem solving. Originality encompasses the production of original or new ideas, which are ones that are novel and never thought off before. On the other hand, usefulness refers to ideas that bring value to a specific condition, being appropriate, significant and adaptive. This is evident as often creativity involves solving a particular problem and the creative ideas generated must not only be original but must be able to solve the specified problem. Vinake (1952) posits that creative thought is actually an intermediate between problem solving and imagination and it takes place in specific situations involving nearly indistinguishable problem solving behaviour and imagination.

Amabile (1983) stated that creativity is a combination of three main aspects, which are knowledge and capabilities relevant to a particular field, internal motivation and also skills for creative endeavours. The creative relevant skills include the know how to produce novel and useful ideas, work style such as ability to focus intensely on a problem and the ability to handle ambiguities during problem solving. The other view regarding creative cognitive processes is also directly related to creative development and reflects the steps involved in creative thinking of an individual in coming up with the final product. However, the creative product could be the person himself as he might have developed and learnt the art of overcoming creativity blocks, to understand and use the CPS techniques and able to determine the creative potential in himself and within the group environment. He is one who is committed towards the ultimate goal of creativity and innovation.

Creativity defined in the most complete perspective is where it is a process of becoming sensitive to problems or deficiencies, sensing gaps in knowledge, aware of missing elements or disharmonies and searching out solutions, identifying or formulating hypothesis about the deficiencies; testing and re-testing these hypothesis and possibly modifying and re-testing them; and finally communicating the results (Torrance & Myers,

1970 & Torrance, 1974). This is by far the most comprehensive approach to creativity where it covers all the relevant aspects of creative thinking so often experienced by creative individuals. By way of this definition, the view taken is one of a process approach to creativity.

3.0 PRESSURE AND STRESS

Pressure at work is nowadays totally unavoidable owing to the current economic climate. Increased competition, pressure from clients to reduce fees and hours, increasing liability risk, rapid advancement of technology to keep pace with and standards overload are just some of the issues businesses and its people face. Most organisations are faced with instability as the rate of change is accelerating at enormous pace and employees are expected to adapt to these higher demands without complain (Williams, 1994; McHugh, 1997). With the increased expectation of higher efficiency and effectiveness, employees are subjected to enormous pressure throughout.

Pressure is unavoidable and in fact is necessary to produce higher performance and output. The importance of endurance, meaning the ability to endure pressure and failure, and persevere when others facing the similar problem had given up is a key factor to a project's success and breakthrough (Sundgren & Styhre, 2003). Burton *et al.* (1999) and Crossnan *et al.* (1999) reported that pressure or tension is necessary for learning and for the exploration and exploitation for learning. However, it needs to be managed properly as it can also be negative and detrimental to overall performance if it becomes stress in turn. Pressure is neither positive nor negative. The way that an individual reacts to pressure is said to be much more important than the pressure in itself (Anspaugh *et al.*, 2000). If pressure is channelled in the right direction, it can bring about optimal levels of performance.

There are generally two modes of an increase in pressure. Individuals could both learn to adapt to this pressure increase and continue to develop and experience growth. This is referred to as resilience adaptation. The other outcome of pressure is the inability to cope with the increase in pressure and begin to experience stress. In short, stress occurs when one is unable to cope with pressure.

Stress is defined as a temporary experience to state anxiety. It takes place when pressure levels start to further increase and one's coping mechanism begins to be stretched. As such, pressure is the force that may produce stress.

Stress according to Seyle (1978, 1993) is defined as the non-specific response of the body to any demands made upon it. Stress has often been linked to its debilitating effect on one's psychological stability, physiological stamina as well as adaptive functioning (Bloyd, 2003). However, recent literature seems to be moving away from this stand and viewing stress in the light of its strengths and benefits that might bring about some positive outcomes to those affected. If utilised wisely, it is a force that generates and initiates action. This type of approach to positive stress is termed eustress (Seyle, 1978). It helps in emotional as well as psychological growth. Eustress is synonymous to pleasurable experiences, meaningful life and fosters an attitude of positiveness in terms of solution

finding when faced with complex and challenging problems. Distress on the other extreme is linked to negative responses.

Individuals resort to coping strategies to handle the increase in pressure. Coping is a process where an ongoing cognitive and behavioural effort is employed to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of a person (Shimazu & Kosugi, 2003). Based on the process theory of stress, coping changes in accordance with the situational contexts where it is used and the strategy used to handle it determines one's mental health. A coping-situation match that is emotion-focused or even avoidance strategies may be adaptive in situation where there is no personal control. A problem-focused or active strategy on the other hand is more effective if used in situations where a higher degree of control can be exerted over the situation (Mattlin *et al.*, 1990; Zakowski, *et al.*, 2001).

4.0 PERFORMANCE AND PRESSURE

The Inverted-U Theory developed by Hanson (1986) explains the stress response, which can actually enhance and increase the level of either mental or physical performance as depicted in Figure 1.

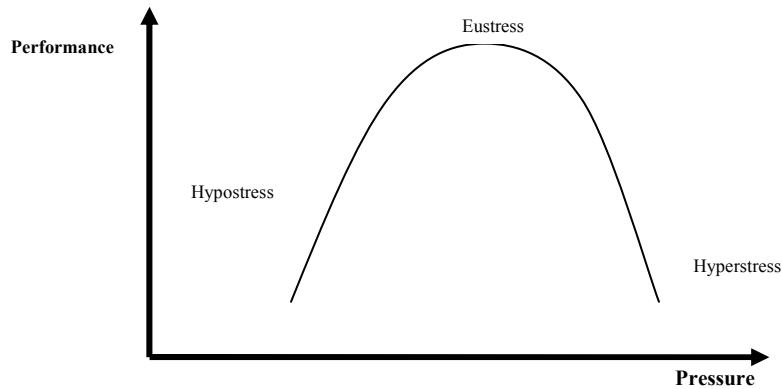


Figure 1: Types of Pressure on Performance

Hypostress, which is the lack of pressure, result in lack of effort. There exists an optimal level of pressure, which brings about peak performance, which is termed eustress. Anspaugh *et al.* (2000) lists some of the positive outcomes that can be associated with pressure. From a physical viewpoint eustress brings about high energy levels, increased stamina, flexibility of muscles and joints as well as freedom from stress-related disease. Emotionally, eustress brings about a better sense of control, a higher responsiveness to the surrounding environment as its alertness, improved interpersonal relationships as well as morale.

The majority of individual's performance when related to pressure is depicted in Figure 2. When the individual is faced with lack of stimulation, boredom tends to step in and it can be a source of stress in turn. Individuals who have repetitive tasks in their jobs often face this predicament. This state is termed the boredom zone. An increase in pressure often

results in the individual feeling a sense of urgency and need to perform better. This type of pressure is seen as positive in nature as it tends to stimulate individuals to face up to the challenges and seize the opportunities and if taken, one's confidence and self-esteem grows in tandem. This state is termed the comfort zone.

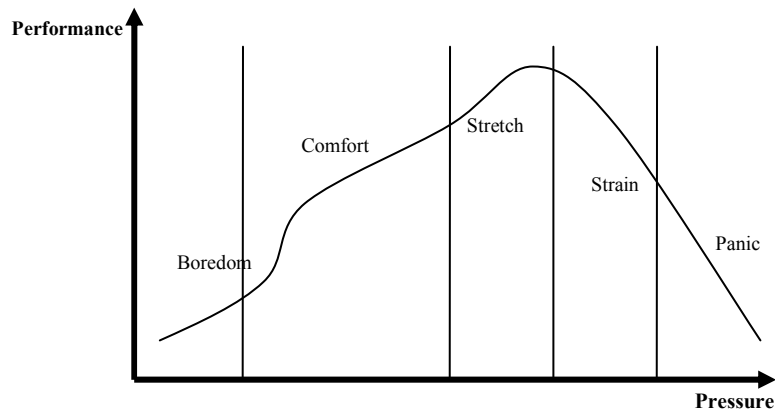


Figure 2: Effect of Pressure on Performance

The next state is the stretch zone where pressure increase slightly and the individual will try to adapt to that pressure increase. If he is able to handle that pressure, his performance and output is at its optimum level. When pressure is continuously increased the individual will begin to feel high stress levels and strain. If one is unable to cope with that pressure, performance is affected as the coping mechanism begins to succumb to that pressure. This is called the strain zone. Further increase in pressure often results in a state of panic where the mechanism to cope with pressure-increase completely breaks down. Here the stress levels are unbearable and a severe drop in performance is experienced. When pressure reaches optimal levels individuals may start to experience a sense of up tightness as well as feeling tense, depressed and anxiety. This is an indication of stress and if it is not curtailed the affected individual can experience worn out or even burn out (McHugh, 1997).

Carson and Runco (1999) reported that it is not the actual pressure that influences one's mental and emotional health, relational functioning and physical well-being but more of how the individual reacts, experiences and copes with it that really matters. Heaney (2001) reported that a certain degree of pressure is necessary to help one keep focus of mind and also encourages the individual to complete tasks and not procrastinate. However, excessive pressure does bring about stress in the long term and stress is said to be detrimental to performance effectiveness. In order to cope with pressure and avoid stress is to have a well-defined objective or goal and being able to prioritise of what needs to be done (Heaney, 2001).

When pressure leads to stress, an individual's performance starts to be affected as well as personal well-being and health. Higher incidences of absenteeism, lower productivity and job dissatisfaction, and a higher turnover are some of the behavioural patterns often observed. Also observed is an increase in recruitment and retraining costs when a higher turnover rate is experienced (McHugh, 1997).

Individuals who are categorised as hardy individuals tend to demonstrate a positive psychological outlook that serves as a buffer against distress as well as illness. These individuals perform better under stressful situations compared to low hardy individuals (Kobasa *et al.*, 1981). As such, hardiness acts as buffer moderating stress reactions. However, the actual mechanism used by hardy individuals is still unclear and not fully understood.

Maddi (1999) reported that hardy people view stressful events in a much broader perspective, remaining optimistic and are proactive in deciphering meaning under those challenging conditions. Maddi and Kobasa (1984), Rhodewalt and Zone (1989) and Wiebe (1991) stated that these individuals often alter their perceptions of stressful events to make it less negative and utilise active transformational coping throughout. They do not subject themselves to the stressful situation but actively seek out transformational coping strategies to make it more desirable and palatable (Orr & Westman, 1990). Transformational coping strategies encompass how the stressful situation is perceived, imagination activation or imaginative stimulation and decision making in producing ways of overcoming the stressful situation, ways of mobilising resources and performing any other activities in decision making (Kobasa *et al.*, 1985).

Hardiness is synonymous to one's appraisal of stress per se based on the context. Hardy individuals were found to rarely deny or exclude the stress especially in situations where they had to themselves prepare to face and handle it. However, they were said to have a positive outlook of the stress situation upon completion of the task and this is said to be due to their active coping mechanism that they had accessed. Westman (1990) states that hardy individuals make decisions and implement action plans that are very much based on the actual context of the situation as they have a positive outlook to life. Both hardy as well as non-hardy individuals experience stressful events in similar ways but the hardy one's tend to appraise their lives as being less stressful and more often found to be optimistic (Schlosser & Sheeley, 1985; Rhodewalt & Zone, 1989). It is hypothesised that these individuals are more able to access and utilise creative thinking approaches to problem solving in order to solve a problem and also alter the stressful event making it more enjoyable and acceptable as opposed to low hardy individuals. This unique capability comes with an inert need for additional time to access their creative abilities (Bloyd, 2003).

5.0 CREATIVITY AND PRESSURE

Ford (1996) and Jex (1998) stated that stress and strain would result in lower motivational levels, reduced performance and less creative actions. They also mentioned that work pressure results in lower levels of creative output. However, it was found to be inaccurate as pressure or stress could bring about higher levels of creativity but depending on the type of stress experienced. Jex (1998) posits that this could be one of the reasons of past results in terms of pressure and creativity, which have been inconclusive up to now.

VanGundy (1987, 1988) postulated that optimal work output could be achieved if an optimal work pressure is exerted. Excess work pressure results in an increase in stress, which negatively affects the flow of creative ideas, whereas too little work pressure in turn

results in low internal motivation and poor creative output. Optimal work pressure produces just the right amount of freedom for creative exploration.

It was found that the effect of eustress on the psychological make-up is enhanced level of creativity as well as thinking ability, greater goal orientation or focus and increased levels of motivation. Therefore, the proper usage of pressure in work environments can bring about high levels of creativity and innovation and as such, pressure and stress should not be viewed as entirely detrimental to creative endeavours.

In times of heightened creative periods, an individual may experience anxiety, pressure, stress, depression or feelings of inadequacy. However, the creative process in itself might actually act as a buffer or neutraliser to compensate for some of the potential negative influences of these pressure situations (Carson *et al.*, 1994). Preparing or building an individual up to reach a creative plateau could be much more effective if they learn and acquire approaches that could assist them in handling and neutralising some of these stressors. Pressure and anxiety supplies the creative energy and is the means of achieving a measure of self-realisation in the process (Senyshyn, 1999). It is what that awakens them to their unlimited and creative potential. Learning how to handle or cope with these stressors does help people produce more creative outputs during decision-making, goal setting and problem solving (Carson & Runco, 1999).

Richards (1990) stated that most creative individuals are able to handle stress and pressure well, and have a well-integrated personality which reflects a stable emotional and psychological state. They are also reported to be more resistant to social pressure as well as pressure to conform (Carson & Runco, 1999). It is believed that creativity could actually be directly related to one's capability to cope with stress (Carson & Runco, 1999). CPS is apparently a means of resolving this pressure or stress and adapting to these kinds of situations (VanGundy, 1987; Runco, 1994). As such, CPS abilities is linked to positive mental health and having an internal climate, which refers to one's positive psychological and mental outlook, is paramount for creative endeavours (Carson & Runco, 1999). Even though the external environment can be stressful, it is important that internally the individual is in control at all times. And by using the CPS approach, many negative aspect of the internal climate could be overcome as long as a minimal level of internal motivation exist (VanGundy, 1987, 1988).

Dyne *et al.* (2002) research on the relationship between work pressure and home strain on creativity revealed that as work pressure increases, creativity levels also increase in tandem provided there exist a strong level of relationship between employee and the superior. This is valued as having lots of communication taking place, support as well as encouragement, which is a form of inspiration to the employee. Owing to that, work pressure actually helps promote creativity provided there is a lot of support and encouragement shown by their immediate superior. On the other hand, home pressure or stress resulting from the family is detrimental to creativity irrespective of the type of leadership and support provided by the management (Dyne *et al.*, 2002).

Best ideas can actually be produced when faced with pressure. The need to think fast is seen as an approach to creative thinking. It helps bringing about focus and urgency. Taylor (1966) had reported that creative individuals were found to be able to handle and withstand

higher levels of stress. Pressure does indeed help in coming up with an answer. So the pressure to get someone to say something on the spot during creativity or eureka training process does produce results (Mattimore, 1993).

This study aspires to determine whether people can be tuned to understand their pressure threshold or acceptable levels of pressure and then accessing their creative abilities producing outstandingly creative outputs without succumbing to the pressure itself. This approach to creativity is essential as work environments are far from being pressure-free and the common adage that creativity flourishes only in environments free from pressure needs a rethink.

6.0 INCUBATION PROCESS

Incubation, a period when the conscious thought process is directed away from a particular issue has long been viewed by psychologist and psychiatrists as a regressive thought process. However, it was first stated by Wallas (1926) of being critical to genuine creative thinking and inspirational breakthroughs. According to Kubie (1958), the preconscious rather than the unconscious was responsible for creativity. He hypothesised that the preconscious state is endowed with the flexibility much needed in creative thinking unlike the unconscious that is rather rigid and stifling. To this, incubation should be encouraged, as it is not only healthy but also progressive.

May (1975) noted that the creative process is not an irrational process but a suprarational process. This suprarational stage involves the combination of the emotional aspect together with the volitional and intellectual perspectives. It encompasses a realistic problem encounter, intense involvement, focus and absorption coupled with heightened consciousness and inter-relationships. Creative thinking is deemed as the highest degree of emotional health and is the means of self-actualising (May 1975). Arieti (1976) further postulated on the creativity issue and stated that creativity is the magic synthesis, binding together of the primitive and irrational forces of the unconscious together with the logical and rational processes. He termed the preconscious state as a “tertiary process” differentiating between the unconscious and logical processes.

Rothenberg (1976a) proposed two nonregressive states to explain creativity. The first, he coined as Janusian thinking that consists of actively perceiving two separate and totally opposite concepts, images or ideas at a particular point in time. The second is Homospatial thinking, that takes place when two or more differing entities are viewed simultaneously in a particular location bring about the birth of a new identity Rothenberg (1976b). Janusians as well as homospatial thinking are advanced forms of secondary-process thinking and do not take place in a primary thinking mode. They at times defy logic as it transcends the ordinary, rational thinking thought processes. Both these types of thinking are an integral part of creative thinking and are useful in describing the processes taking place during the incubation stage of problem solving. This unity of opposites or diversity is a common phenomenon experienced by successful creators (Barron, 1969; Prince, 1970; MacKinnon, 1978).

Torrance (1995) listed the important criteria during the incubation process for high quality creative thinking to occur. Firstly, various states of consciousness other than the rational, logical, conscious state need to be activated at least for brief periods throughout the process. Secondly, intellectual, verbal expressions as well as emotional functions must be simultaneously activated and brought together. Thirdly, the reason towards solving a particular problem need to be evident right from the onset and intense focus, absorption, commitment, involvement and heightened consciousness taking place during the incubation stage. The next criterion is the realisation of completely opposite and contradictory view regarding a particular concept or situation and the need for the ideas to be confronted simultaneously. The last criterion is the usage of at least two of the modalities for successful incubation to creative solutions.

7.0 INSPIRATION

Creativity was viewed with much mysticism centuries ago and a creative act is often thought of as being possible only through some divine intervention having full of inspiration (Rothenberg & Hausman, 1976). However, the psychoanalytic approach to the study of creativity espoused that creativity arises from the tension between one's conscious reality and unconscious drives. In short, creative output is actually an avenue to express one's unconscious need or wishes in a form acceptable to society. This unconscious need comes in many forms and varieties such as the need for power, fame, riches, honour or even love (Vernon, 1970). Creative inspiration needs to be wooed and than waited to dawn upon the individual, as it cannot be voluntarily summoned (Leavy, 2002). Bonnardel and Marmeche (2004) noted that external sources of inspiration do enhance creative ideation. Kris (1952) also stated that adaptive regression and elaboration occur during creative endeavours. Adaptive regression is the intrusion of unmodulated thoughts during consciousness and often occurs during acts of active problem solving. It often happens during sleep, daydreams, fantasies and intoxication. During phases of inspiration, an individual is also seen as being intoxicated and able to produce works of exceptional quality. Elaboration on the other hand is the process of transforming the raw idea through reality-oriented and ego-controlled thinking. The fine-line between one's state of conscious reality and unconsciousness is where the true source of creativity lies (Kubie, 1958).

The state of inspiration is an embodiment or feeling of intense positive emotion, which is rare and seen as highly desirable (Council, 1988). The state of an inspired individual is exhilarating and full of positiveness and is a moment in which the individual expands develops and grows. If this energy is tapped in the right manner, the inspired individual becomes much more perceptive to the surrounding and his thoughts. Council (1988) and Whitting (1985) reported that there are two crucial elements in establishing the right condition for creativity to take place. The first would be a sense of freedom within that is felt by the individual in pursuit of creative inspiration. The second would be constant support and positive external reinforcement for one's creative efforts. Freedom within is crucial for spontaneity and genius to be exemplified. Freedom is one's innate predisposition and it goes beyond education (Albert & Runco, 1999). Mattimore (1993) stated that talent is important but inspiration is crucial.

“...all creative individuals and inventors work extremely hard at their craft, maybe even to the point of obsession as they never can tell at what moment and under what circumstances, inspiration will arrive....” Mattimore, 1993

Creators do not sit idle waiting for inspiration to emerge but actively seek it out. There are three methods of doing so. Firstly, would be continuously asking all kinds of questions, no matter how far fetched they are or how absurd it might be. Secondly, would be to visualise or see answers or possible outcomes. Lastly, is to freely associate different concepts, no matter how remote the connections. These skills need to be honed and sharpened to perfect it and reach a high level of proficiency (Mattimore, 1993). Ragsdell (2001) stated that reflection is also a source of creative inspiration. Reflection could be on the dynamic relationships in the organisation, on the approaches and assessment being applied within the work setting as well on the creative methods employed and its resulting output.

When inspiration dawns upon an individual, a sense of great excitement, joy and arousal is experienced (Councill, 1988). The effect of arousal and attention on creative thinking has been examined via the experimental approach. It was found that creative individuals had a higher level of attention span compared to less highly creative persons. This could be attributed to their ability to move into the secondary process states at ease (Rothenberg, 1990, 1995; Eysenck, 1993). Arousal on the other hand is attributed to the broadening of one's attention capacity that has been reported to play a significant role in creative thinking. This is apparently so during problem solving activities, where obvious ideas are initially generated and once exhausted, more remote or unique ideas starts to emerge. Individuals with a higher capacity for broader attention allows for more remote ideas to find associations and in turn more creative ideas. Arousal could take place through the use of inspiration.

Torrance (1978) noted that having the right attitude and staying responsive are equally important elements for creativity. He also said that the human intellect is divided into three sub-categories, which are termed the conscious, preconscious and unconscious. The conscious aspect of the mind is linked to logical and rationality as perceived in reality and involves the phases of preparation and verification. The preconscious mind is where the element of inspiration takes credence. This is where incubation and illumination takes place and occurs freely in states of abstraction, in sleep, in dreams and in writing and painting. It is where free association in terms of non-selected paths of thoughts takes place. Staying within a state of duality or a synthesis of contradictory aptitudes can assist in reaching a state of creative inspiration (Jung, 1958; Councill, 1988). Mental relaxation and the constant practice of concentration and imagination could also be a source of inspirational attainment much sought after (Councill, 1988).

8.0 DISTINCTIVE CREATIVITY ENDEAVOUR MODEL

The proposed model to be used in the study is termed the DCE model. The DCE model of creative development takes after the CPS model developed jointly by Osborn and Parnes in 1967. The further enhancement of the CPS into a more comprehensive and integrated model has important theoretical implications.

Although it has been widely reported of the negative impact pressure, stress and strain has on the psychological well-being of an individual, it has been reported that pressure does have a positive impact on the creativity of individuals (Belcher, 1975). The combination of pressure threshold realisation and creative inspiration in this study hopes to allay the current notion that it must be avoided at all cost. It is imperative that we learn to perform within the realm of reality, being pressurised and stressed and still be able to inspire one's creative potential and produce creatively at the desired level.

The first facet of the DCE model is termed realisation, which involves realising, and understanding the problem at hand and most importantly accepting the situation. Analysis encourages preparation and concentration by the participant to search for all available information. The third facet, pressure is based on the belief that pressure or stress can have a positive role in creative thinking development (Bowmann & Boone, 1998; Grossman & Wiseman, 1993). Based on this notion, the model incorporates the element of pressure on the participants in the program to understand and realise their threshold levels for pressure and creates the sense of urgency to produce and perform within set boundaries and limitations while still allowing psychological freedom and inspired to create. The expectation of the quality of outcome should also be given attention. This is all done in the hope of inducing them to seriously put on their creative thinking caps in solving ill-defined problems.

Inspiration refers to the key inspirational elements one often experiences. Inspiration is also reflected by the great findings as well as creativity by renowned individuals in the hope that the participants will be inspired, motivated, and energised to emulate them. This is similar to the sacred mantra of our society "Malaysia Boleh" where it propels the nation to extraordinary heights and achievement never thought possible before. The element of inspiration is also a new factor never before seen in a creativity model. Inspiration through visualisation and imagination is crucial as thinking in images helps provoke the preconscious mind during ideation. It is here that the mind forms new linkages with bits and pieces of information available in coming up with new ideas.

"...Imagination is more important than knowledge, for knowledge is limited, while imagination embraces the entire world..." Albert Einstein

Incubation is the phase where participants will be made to focus their attention away from the issue at hand as a form of rejuvenating the mind before the crucial phase of illumination takes place. The idea-finding stage is by far the most painful, as the individual is required to generate as many new ideas as possible with some being extraordinary and creative. However, with the use of incubation and illumination, it increases the probability of coming out with highly creative ideas and solutions, than merely waiting for an idea to emerge. This works more as a form of inducing the preconscious to make linkages, redefinition and combination of existing information in producing creative ideas.

Synthesis is where the development of ideas is made together with putting the pieces together and finally building momentum. Once this is completed it is then time to put the creative plan into motion. This phase is termed the action phase. Finally, there needs to be an evaluative phase to determine the effectiveness of the plan. If it is found not to be

effective, than there is a need to return to the drawing board at the realisation stage to once again evaluate the problem. However, if the plan is successful, the final phase would then be the conviction phase where there needs to be a strong commitment towards seeing the idea through.

As mentioned above, the DCE model proposes a modification to the CPS model via the inclusion of the two additional stages, which are the pressure threshold realisation and the inspiration phases. These two phases shall be included between the problem-finding and idea-finding stages of the CPS model. As such, the proposed DCE model contains eight distinctive stages and is deemed as follows:

- I. objective-finding
- II. fact-finding
- III. problem-finding
- IV. pressure stage (Pressure Threshold Realisation)
- V. creative inspiration stage (Incubation & Illumination)
- VI. idea-finding
- VII. solution-finding
- VIII. acceptance-finding

Stages I to III deals primarily with the issue of understanding and determining the exact challenge or problem to focus on. Stage IV concerns realising the constraints and limitations that are evident in the pursuit of the problem solving endeavour. Stage V involves taking the mind momentarily off the current problem and focusing on other tasks while waiting for the preconscious to produce outstanding ideas never thought off before. Actual creativity much occurs within this stage. Stage VI involves generating as many potential solutions as possible by exhausting all conscious and possible solutions. The final stage looks into the action or solution implementation, while verifying its effectiveness thereafter.

9.0 METHODOLOGY

This research was designed and structured to investigate the effect of pressure threshold realisation and creative inspiration on individuals. In the present study, the sample consisted of executives and managers from various multinational organisations in Malaysia. The statistical analysis used in the study included a descriptive analysis of the sample of study, exploratory data analysis on all groups, a paired sample t-test, eta-squared and multivariate analysis of variance (MANOVA) to attain the objectives of the overall research undertaken. This chapter states the objectives of the study. The research design being experimental in nature is clearly spelled out while other sections include description of the samples used and sample sizes, instrumentation, data collection, testing and scoring procedures, and analysis together with a summary.

The research study undertaken has two main objectives:-

- a) to further enhance upon Osborn-Parnes CPS approach for creative thinking taking into account two new elements namely pressure threshold realisation and creative inspiration
- b) to determine the effectiveness of the proposed elements to the enhanced Osborn-Parnes CPS approach via an experimental approach.

9.1 The Sample

For the study, six groups were chosen to undergo various forms of the creative problem-solving program. Groups chosen had to specifically consist of minimum 15 participants to render the program effective. However, group sizes ranged from 15 to 20 participants. All participants were gathered from various multinational corporations in Malaysia and were at least employed in either an executive or managerial position. They all had at least a college diploma and were fluent in English as it was the mode of instruction and the training materials were in English. A total of 5 multinational organisations took part in the research.

It took almost a year to secure all groups and complete the whole experiment as logistics needed to be given due consideration. Participants were informed of the purpose of the experiments prior to their involvement and willingly participated.

9.2 Research Design

The study undertaken is built on an experimental framework comprising various variations of a creative training program. Subjects were required to undergo a creative ability test prior to the start of the program and another at the end of the program to ascertain the difference upon being exposed to certain creative thinking development principles of a creative program. The objective was to prove whether the inclusion of a pressure threshold realisation phase and a creative inspiration phase results in higher creativity as compared to the standard CPS approach.

9.3 Solomon Four-Group Experimental Design

The experimental design chosen for the research was based on a modified version of the Solomon Four-Group Design. In the Solomon Four-Group Design, the main effects of testing and the interaction of testing and program exposure are determined. The symbols used to explain the experimental design are given as X to represent the exposure of a group to an experimental variable or event where the effects of it are to be measured. O refers to some process of observation or measurement and in this research perspective is a pretest and posttest.

Table 1: List of Experimental Programs

Program	Pretest	Program	Posttest
DCE	O_1	X_{DCE}	O_2
CPS	O_1	X_{CPS}	O_2
CPSI	O_1	X_{CPSI}	O_2
CPSP	O_1	X_{CPSP}	O_2
PLA	O_1	X_{PLA}	O_2

O_1 =pretest, O_2 =posttest

Note: Xs and Os in a given row are applied to the same specific individuals, DCE, CPS, CPSI, CPSP, PLA (Placebo)

In total there were five different training programs, which were all modifications to the Osborn-Parnes CPS model. The first program that was the original CPS without any

modifications was termed the CPS program. The second was called the CPSI program as an additional section was added to the CPS program, which was the creative inspiration phase. The third program was the CPSP and it also consisted of a modification to the CPS program where an inclusion by way of a pressure threshold realisation phase was made. The DCE model or better known as the DCE program consisted of the CPS program with an additional pressure threshold realisation phase and a creative inspiration phase. As for the control group, termed the PLA, the program administered was a program on labour laws and regulation with emphasis on sexual exploitation.

A PILOT program was also included in the initial stage of the whole research prior to the commencement of the actual study as a means of ensuring the smoothness of delivery and administration before the actual study was carried out. The PILOT program was based on the principles set forth in the DCE approach and as such is similar to the experience of the DCE program.

9.4 Statistical Analysis

The data obtained upon scoring of the Figural Forms were analysed using the Statistical Programme for Social Sciences (SPSS) software package 10.01. The type of data analysis used depended on the measurement scales. There were generally two types of measurement scales in the study. The first was the nominal scales, which were for the independent variables such as age and gender. The ratio scales for the dependent variables include all the creative thinking scores from the norm-referenced measures as well as the criterion-referenced measures. The analysis is based on the proposed research questions with the usage of SPSS in terms of providing both the descriptive statistics and the inferential statistics.

For the research study, the statistical analysis used was the Paired Sample t-test in determining the CI scores, and National Percentile CI. The CI score is obtained by adding the Average Standard Score (ASS) of all the norm-referenced measures with the scores on the checklist of creative strengths. It serves as the overall indicator of creative potential. The National Percentile Ranks obtained for each of the norms-referenced measures and CI score and is a comparison of one's standard scores with that of other individuals at similar levels. The MANOVA was used to compare the various creativity scores obtained to determine whether the mean difference between the various programs as well as the factors on the combination of dependent variable would have likely to have occurred by chance.

10.0 RESULTS AND DISCUSSION

This section contains sections on the significance of the creativity programs through the MANOVA. The profile of the creativity performance is also presented through analysis of the CI as well as the ASS. Results of the paired sample t-test on various creativity programs are presented for the CI and National Percentile CI (NPCI). They are analysed based on the ASS.

10.1 Creative Performance Comparison

The Creative Performance Comparison analyses whether there exist a significant difference between the pre and posttests results for the various creativity programs (DCE, CPS, CPSI, CPSP, PLA) on the CI and National Percentile CI (NPCI).

10.2 Creativity Index Results

The CI standard score is a normalised standard score reflecting the overall creative performance on the TTCT and reported on a scale of 100 with a standard deviation of 20.

10.3 Distinctive Creativity Endeavour Program

Table 2 shows the paired sample t-test analysis carried out to evaluate the impact of exposure to various CPS programs on the CI, while Figure 4 depicts it in graphical form. The DCE program showed a significant increase in CI score from the pretest ($\underline{M}_1=68.69$, $\underline{SD}_1=16.59$) to posttest ($\underline{M}_2=101.60$, $\underline{SD}_2=15.41$), $t_{(20)}=-8.37$, $p=0.005$. The eta-squared (η^2) statistic (0.7867) indicated a very large effect size. The DCE program has the largest mean difference of 32.91 (47.91%) depicting an improvement of approximately 50% from the exposure to the principles of the DCE model. The mean difference is statistically significant as the significance level of 0.005 is below the alpha level of 0.05 and in turn the null hypotheses (H_0) is rejected and the alternative accepted. As such, there is a significant difference between the pretest score of the TTCT and the posttest score upon implementation of the DCE model.

The DCE program advocates having a very clear goal state, moving from the initial state gradually via various sub-goals where all possible actions fall within the problem space as espoused by Newell and Simon (1999). As such, problem solving is deemed as finding the correct sequence of actions moving from start to finish within the problem space (Newell, 1972, Simon, 1999, Sternberg, 1999). The use of sublevel programs such as algorithms which are sequence of operations that when constantly applied guarantees solution to problems (Hunt, 1995, Sternberg, 2000) or heuristics, mental shortcuts used in problem solving such as the use of intuition, informal and speculative strategies (Holyoak, 1990, Karf, 1999, Fishoff, 1999, Sternberg, 2000). The mental callisthenics are crucial in preparing the mind for creative exploration and insight during the incubation phase (Dominouski & Jenrick, 1973, Davidson & Sternberg, 1984; Smith & Blankenship, 1984, 1989, Sternberg & Davidson, 1995), when the mind and soul is subjected to intense freedom to creatively ideate through creative inspiration and performing at optimal levels through the principle of pressure threshold realisation.

Program	\underline{M}_1	\underline{SD}_1	\underline{M}_2	\underline{SD}_2	Y	T	p	%	η^2
DCE	68.69	16.59	101.60	15.41	32.91	-8.37	0.005	47.91	0.7867
CPS	63.55	13.07	67.96	8.16	4.41	-2.01	0.063	6.94	0.2117
CPSI	67.46	24.15	77.87	18.26	10.41	-4.92	0.005	15.43	0.5869
CPSP	71.34	26.89	82.34	20.99	11.00	-4.23	0.001	15.42	0.5277
PLA	75.18	22.46	66.80	20.32	8.38	1.790	0.094	-11.15	0.1760

Table 2: Creativity

Index Scores

DCE, CPS, CPSI, CPSP, PLA

\underline{M}_1 = Pretest mean score

\underline{SD}_1 = pretest standard deviation

\underline{M}_2 = Posttest mean score \underline{SD}_2 = posttest standard deviation
 y = mean difference ($\underline{M}_2 - \underline{M}_1$)

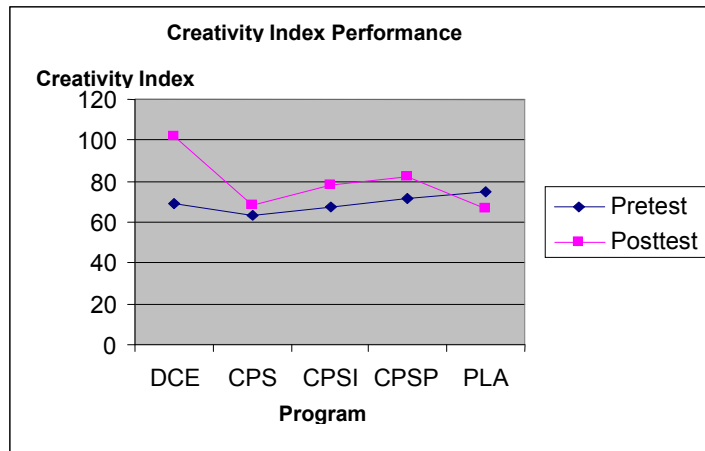


Figure 3: Creativity Index Scores

10.4 Creativity Problem Solving Program

The CI score for the CPS program shows an increase from the pretest ($\underline{M}_1=63.55$, $\underline{SD}_1=13.07$) to posttest ($\underline{M}_2=67.96$, $\underline{SD}_2=8.16$), $t_{(16)}=-2.01$, $p=0.063$. The eta-squared (η^2) statistic (0.2117) indicates a large effect size. The mean difference measured was only 4.41 (6.94%) between the pretest and posttest. The significance level of 0.063 is higher than the alpha level of 0.05 and as such we fail to reject the null hypotheses (H_0) and conclude that the difference between the pre and posttests scores is deemed non-significant. This goes to show that in comparison between both the DCE and CPS approaches to creative development, the DCE clearly surpasses the CPS in being able to develop creativity.

10.5 Creativity Problem Solving + Inspiration and Creativity Problem Solving + Pressure Threshold Realisation Program

For the CPSI program, the CI scores for the pretest ($\underline{M}_1=67.46$, $\underline{SD}_1=24.15$) to posttest ($\underline{M}_2=77.87$, $\underline{SD}_2=18.27$), $t_{(18)}=-4.915$, $p=0.005$. The eta-squared statistic ($\eta^2=0.5869$) indicated a very large effect size. The mean difference between pre and posttest was 10.41 or a percentage increase of 15.43. If compared to the CPS program, there is almost a 50% increase in creativity if the element of inspiration is included as part of the CPS program. This goes to show that individuals need some form of inspiration in order to tap deep within the realms of their creative preconscious and the CPSI provides them with the necessary tools. The CPSP program showed CI scores from the pretest ($\underline{M}_1=71.34$, $\underline{SD}_1=26.87$) to posttest ($\underline{M}_2=82.34$, $\underline{SD}_2=20.99$), $t_{(15)}=-4.23$, $p=0.001$, with an eta-squared statistic of ($\eta^2=0.5277$) indicating a very large effect between the CPSP program and the CI score. The mean difference between the pre and posttest was 15.42%. As such, it proves that by having an understanding of one's own pressure threshold and knowing how to

utilise it positively at the optimum level, one is than able to remain in control at all times under pressure yet able to ideate creatively.

For both the CPSI and CPSP programs, the mean difference show a significance level of 0.005 and 0.001 respectively, below the alpha level of 0.05 and as such reject the null hypotheses. It is than concluded that the mean difference is significant unlike that observed for the CPS program. The percentage increase on creativity scores from the pre to posttest for the CPSI and CPSP in total is approximately 30%, which is remarkably higher than the CPS program but if compared to the DCE program it was almost 48%. This goes to show that having both the pressure threshold realisation phase together with the creative inspiration phase does have a cumulative effect as if considered separately. Thus, it is our conclusive evidence that both these elements need to be combined together for optimum results as demonstrated by the DCE model. The CPS program also produced an eta-squared (η^2) statistic, which was a mark below that achieved by the DCE, CPSI and CPSP programs respectively and show that there is a significant influence these programs have on the participants CI scores as compared to the CPS program. Once again, the combined effect of having both the pressure threshold realisation and the inspiration phases together in a single program produces enhanced creativity as when carried out separately within the CPS program.

10.6 Placebo Program

The PLA program being exposed to a totally uncreative training program was used as the control group. Subjects were not exposed to any creative aspect in the program as the program involved lots of memorisation, policies and regulations. The pretest CI score of ($M_1=75.18$, $SD_1=22.46$) to a posttest score of ($M_2=66.80$, $SD_2=20.32$), $t_{(17)}=1.790$, $p=0.094$ revealed a drastic drop in creativity as there was a reduction of 11.15% in the posttest compared to the pretest and we conclude that exposure to uncreative approaches that involves lots of memorisation and little exploration, experimentation and creative ideation results in reduced creativity. Thus, it is crucial for people to expose themselves to creative approaches in handling problems as opposed to rigid and uncreative ways.

10.7 Discussion on Creative Performance

Being trained and guided through a creative thinking development program that includes pressure threshold realisation as an important factor besides creative inspiration as a mode of dwelling within the deep confinement of the unconscious with a clear objective in mind is proven to be able to churn out the intrinsic creative ability of individuals. Having a system of defining the proper problem or challenge to focus on before embarking on dissecting it in crystallising the issue at hand, defining all the relevant and possible alternatives and approaches to problem solving and finally selecting a specific approach are all crucial aspects in CPS. However, knowing how to ideate creatively under pressure and unlocking the creative inspirational points within each individual are aspects that are deemed highly important if we are to produce creatively under pressure. Working long hours on specific tasks in search for a creative breakthrough is a norm in many facets of working life. But to be able to maintain the intensity for long periods under tremendous pressure to produce need just much more than proper problem definition, idea finding,

solution as well as acceptance finding. One needs to acquire effective methods of capitalising on one's pressure threshold and inspiring the creative realms within the preconscious in order to produce creative breakthroughs.

10.8 Distinctive Creativity Endeavour Program

The precept of the DCE model is unlike any other problem solving or CPS model as it encompasses the factor of realising and acknowledging the pressure experienced and able to harness creative ideation at this pressure threshold levels within each individual. As have been reported, it is never the pressure by itself but the reaction towards it that determines the creative performance (Carson & Runco, 1999 & Anspaugh *et al.*, 2000). Pressure supplies the creative energy for self-realisation as it awakens the unlimited creative potential (Sensyshyn, 1999). However, the pressure experienced need to be at optimal threshold levels as it encourages expansion and elaboration of ideas, higher number of strategy planning acts for idea generation and in turn demonstrate higher creativity (Kelly & Karau, 1993). It was reported that with extremely high time pressure, the rate of one's performance might increase but the overall output quality will be affected as people tend to resort to oversimplification of problem solving strategies and resort to less systematic information processing (Kelly & Karau, 1993). Owing to that, individuals need to seek out the pressure threshold levels and perform at that optimal level to produce their best at all times.

Through the DCE program, subjects are made to firstly understand and determine the problems faced and set one clear objective or goal to be achieved. This takes place through the stages of objective finding right through to problem finding. Once the goal is clearly set after much research, information gathering and deliberation, it is then necessary to realise for themselves through analyses and deep contemplation of all the available resources as well as limitations that might exist in search for that one breakthrough find which is not only novel but valuable as well. This often results in pressure to perform under those dire circumstances and if left unchecked one's performance will be affected and the much sort after creative breakthrough might be illusive. Often, the working conditions itself is a source of pressure as was reported by Saunders *et al.* (1995) through factors such as role ambiguity, role conflict, quantitative and qualitative overload, people responsibility and job scope.

Through the DCE program, subjects are not only taught to realise the pressure and acknowledge it, but also taught resilience adaptation, which is learning to cope with it at optimum threshold levels and still perform and experience creative growth, which is the essence of the whole process. This is possible via the inspirational element or approach of the DCE model that assists individuals in knowing their conscious and inspiration points which if tapped is able to harness creative ideation consistently by allowing themselves to tap into the preconscious state where creativity dwells. Leavy (2002) revealed that creative inspiration need to be wooed and waited to dawn upon, as it cannot be summoned voluntarily. But to just wait for illumination to occur during the incubation stage would be detrimental especially when faced with external and maybe internal work pressure and it is better to get individuals working at their optimal pressure capacity and inspire them, fixing them into a state of being creatively inspired to increase the probability of unique ideation

than to await it and leaving it to chance. The DCE program is based on the belief that people can be anchored to produce creatively if they are able to consistently get into creatively inspired states despite the pressure faced from the surrounding and it increases the probability of a creative breakthrough as was used by many eminent creatives since time immemorial. To perceive that creative ideation is only possible in times of calm without any pressure or stress remains a fallacy that is unrealistic in this high paced and competitive world we live in today.

An observation made during the training where inspiration was given precedence, subjects were observed to be more able to produce extraordinary ideas (illumination) once they were within their creatively inspired states. This was evident when subjects moved into the incubation phase and were much more fruitful coming into this phase after being creatively inspired as they were more able to make unusual connections within their preconscious. Csikszentmihalyi (1996) supports this claim when he noted that during incubation ideas tend to mix around below the threshold of consciousness and unusual connections are likely to be made. He further noted that conscious problem solving most often process information in a linear and logical fashion while if they were left to their own, ideas seem to be able to gel in unexpected combinations and unique ideas flourish.

It is believed that creative inspirational states can be achieved irrespective of the environment or social setting one finds him or her in. It is just a matter of accepting and confirming the surroundings to a particular individualistic pattern that echoes the rhythm of their thoughts and habits of action. The crucial ingredient to creative inspiration lies within the conscious as well as subconscious of an individual and not so much the external factors as it has never been proven that a delightful setting induces creativity (Csikszentmihalyi, 1996). As long as the individual can bring meaning to whatever situation one find himself in where one can virtually shut off psychologically from the outside world and concentrate on pursuing creative works while feeling inspired to ideate in a novel and valuable manner; creativity shall flourish. Having a prepared mindset with a deeply felt problem that awaits a creative solution together with having the necessary skills to answer it is more important to creativity than a conducive environment, as even the most appropriate surrounding for creative ideation would be pointless if the mindset is ill-prepared in the very beginning (Csikszentmihalyi, 1996).

Renowned creators and ideators such as Johann Sebastian Bach, Albert Einstein, Beethoven and Marcel Proust produced astoundingly creative works within very humble and uninspiring settings. Einstein for instance produced his masterpiece by way of the Theory of Relativity on a kitchen table in his modest lodgings, though it was believed that he might have been inspired some time earlier in his life by a sublime sight or experience that he capitalised on throughout his life lending inspiration when so needed. As such, a particular experience of awe for any individual could be the catalyst for a lifetime of creative production, provided the individual knows how to utilise it at will and this is a crucial element of the DCE approach, emphasised via the anchoring techniques.

However, what really matters is the ability of all individuals to be able to perform at optimal pressure thresholds while adapting and being in harmony with the surroundings, schedules as well as activities and allow one's consciousness to be in sync with the

environment. When situation and time are in tune, the possibility of experiencing one's unique existence and relationship with the cosmos takes form and thereon original thoughts and actions flow with greater ease (Csikszentmihalyi, 1996).

10.9 Creativity Problem Solving + Pressure Threshold Realisation Program

The CPSP program advocated the use of allowing for a longer initial time period in the state of pressure threshold realisation as this allows for a slightly longer time for one to access their creative abilities. This technique is often used by hardy individuals well known for their creative output (Bloyd, 2003). King and Pope (1999) termed this the "transitional space" where creatives access it for a freedom to exist and still maintain awareness of the external environment constrains and still experience external and internal reality. Hardy people use some form of transformational coping to make stressful situations more acceptable and palatable as was reported by Orr and Westman (1990). The transformational coping methods are by way of imagination, stimulation, more effective mobilisation of resources and ways in overcoming stressful situations (Maddi & Kobasa, 1984, Rhodewalt & Zone, 1989, Wiebe, 1991). Council (1988) and Whitting (1987) set down two conditions for creativity to take place, which are the sense of freedom within and constant support and external reinforcement, which is believed to be criteria necessary for creative endeavours. The internal psychological freedom one experiences is also advocated by Rogers (1962) and Yong (1994). The CPSP program through the element of pressure threshold realisation has taken these aspects into consideration and participants are made to experience them during this stage.

The importance of knowing and experiencing one's pressure threshold level is based on the belief that optimal work output is directly related to optimal pressure experienced (VanGundy, 1984, 1987). And performing at the optimal pressure level does provide freedom for creative exploration provided one rely upon resilience adaptation that is knowing one's pressure threshold levels and adapting to the increase in external and internal pressure and still able to ideate creatively (Anspaugh *et al.*, 2000). Optimal pressure also allows the mind to stay focus and in turn avoid procrastination (Heaney, 2001). Amabile (1983) stated that the three aspects crucial for creativity are having knowledge and capabilities pertaining to a field of specialisation, internally motivated and having the skills for creative endeavour which encompass the ability to handle ambiguities during problem solving and to maintain intense focus when faced with a problem whilst still being psychological under control and free to ideate despite those circumstances.

10.10 Creative Problem Solving + Inspiration Program

The CPSI program is highly effective in assisting individuals to access the freedom within where the creative process takes place within the preconscious while being subjected to external pressure. Participants acknowledge a sudden surge in terms of creative production in this inspired state where they seem to experience creative processes taking place at excruciating pace such as combining and condensing information or ideas and seeking relationship from these string of processes which give meaning to their output in solving a particular challenge or problem at hand. Kubie (1958) revealed that it is in this inspired preconscious state where creative will experience a sudden freedom within to ideate

creatively. Barchilla (1961) supports this notion and stated that it is in this preconscious state where hyper activity is experienced where the recombination and elimination of information and ideas take precedence over any logical thought processes producing what is known as creative and innovative ideation. Rothenberg (1991) and Eysneck (1993) stated that it is during this higher attention span when one moves into the secondary process states at ease and is where creative work actually takes place. This secondary state is also referred to as the preconscious state and is where incubation and illumination occur.

The CPSI program advocates the use of anchoring techniques to bring individuals back to their past and relive those emotions and experiences while being highly focus and intense when focusing on solving a particular problem at hand and feeling the gush of adrenalin in solving it in the most creative manner. It is then when individuals feel they were experiencing peak performance in their own right despite the enormous pressure and anxiety felt and they still managed to triumph despite those consequences. By way of determining the sub modalities of how the mind codifies those particular situations, the individual can unlock those states at will by moving back in time to relive them as and when needed. The CPSI program through the creative inspiration stage seem to be very effective in harnessing peak creative performance and more so during times of pressure through the DCE program.

11.0 CONCLUSION

The CI scores measured based on the TTCT divergent thinking test battery showed that among all the various programs, the DCE program produced the highest percentage increase in creativity scores from the pre-test to the post-test. The DCE program's increase was approximately 48% while that for CPS was only about 7%. The CPSI and CPSP programs showed similar improvements at approximately 15% each. This goes to show that the inclusion of the pressure threshold realisation as well as the creative inspiration element does have a positive effect on one's creative development compared to a pure CPS program. If the percentage increase for the CPSI (15%) having the additional creative inspiration factored into the program and the CPSP (15%) program with the presence of the pressure threshold realisation as part of its program and are subsequently combined, it amounts to 30%, which is still a mark lower compared to that achieved by the DCE (48%) program, which have both elements together. This could be due to the fact that a cumulative effect is evident when both the elements are present within the same program, as it seems to further enhance one's creative ability as compared to a standard CPS approach or having only one element present.

The eta-squared values for all the programs registered values of at least 0.20 indicating a strong effect the various creativity programs have on the participant's creative ability development. The DCE program shows the highest effect at 0.7867 followed by the CPSI (0.5869) and CPSP (0.5277). The CPS programs eta-squared was at 0.2117. This is indicative of the direct influence the programs actually have on the participants' creative thinking potential having undergone the program and this augurs well for the overall research.

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