CHAPTER 4

EVALUATION OF CREATIVITY MODELS

4.1 INTRODUCTION

Within this chapter an analysis of the various creativity, innovation and problem-solving models, theories and literature used as a comparative approach to identify a relevant creativity model deployed in Ellerines' business turn-around, is outlined.

Numerous attempts have been made to outline research studies and models in creativity, with explicit views, definitions and theories that impact business processes, strategic planning, performance enhancement and many other aspects that guide creativity and innovation.

Several writers have also advised theoretical or hypothetical frameworks for explaining the compositional processes by generating standard concepts of creative perceptions and autobiographical explanations of the creative processes (Aranosian, 1981:69; Emmerson, 1989:133; Laske, 1989:10; Roozendaal, 1993:311; Baroni, 1999:4). Webster (2002:19) offers a detailed conceptual framework for creativity thought patterns, which involves composition, performance and evaluation in the form of divergent and convergent reasoning (Wheeler, Waite & Bromfield, 2002:367)

A comprehensive study of models are outlined in a working paper by Plsek (1996:1), examining an assortment of frameworks for creativity and creative thought since 1908, which has been recommended throughout the creativity literary works during the last four decades and extracts the conventional and popular concepts from these numerous creativity models and furthermore presents a composite model that integrates these concepts.

Of significance is the fact that several experts disagree with the thinking on creativity defined to be a chain of actions within a creativity framework.

Plsek (1997:1) makes reference to the fact that Arieti (1976) listed eight frameworks for the creative thinking approach that have been recommended within the time frame of 1908 to 1964. Various alternative creativity frameworks and designs have emerged over time. These frameworks embody an article coming from creativity concepts, in particular the way creativity thought has developed including the emergence of creative thought over time, thus enlightening to examine the frame of reasoning intended by these creativity models.

Furthermore, Plsek (1997:1) cites that Vinacke (1953) is determined that creativity and creative thought within the artistic creation does not always observe a specific creativity framework or creativity model. In much the same train of thought, Gestalt philosophers such as Wertheimer (1945) claim that the approach to creative thinking is actually an incorporated thinking that does not offer on its own towards the division suggested within the phases of a framework. Although these types of sentiments are firmly presented, these are typically the least presented views of creative thinking.

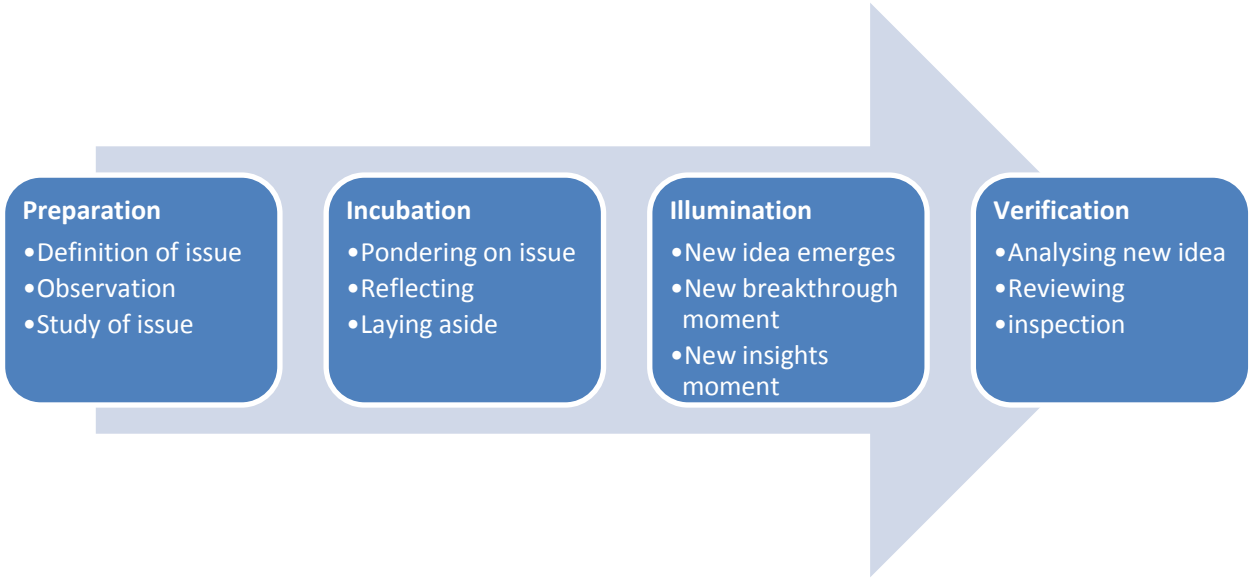
Commerce and industry persons, which have included variations for standards enhancement, tactical organising, re-engineering, tend to be well-positioned dealing with this type of conflict. Most people understand, through practice, that even though models are useful in directing our endeavors, these may be executed too rigidly. Most people realize the fact that frameworks and business models certainly never blind prescriptions. The need to divert significantly from a framework or model in specific circumstances is recognised; however, this will not yield the model worthless. Comprehending the concept of flow is necessary to recognize that a person should not be doctrine orientated concerning the specific sequence regarding the end and start of a specific model or framework. Models, frameworks and designs are helpful, however not to be followed blindly (Plsek, 1997:10).

4.2 WALLAS'S (1926) PROCESS OF CREATIVITY MODEL

An earlier creativity model symbolising human creativeness that had been introduced by Plsek (2006:2), cites that Wallas (1926) revealed a process described by four important stages involving namely, preparation, incubation, illumination and verification. Within the preparatory phase, the creative thinker rationally and methodically analyses the problem

area, frequently constructing a problem statement. When the problem is framed and formed, a time period of 'incubation' will probably occur wherein the subconscious will keep working on the problem. Incubation comes to an end once 'illumination' or the 'aha-moment' happens through unexpected understanding of the problem surfacing towards consciousness. Lastly, verification of the best solution entails verifying to determine that it must be relevant and practical in resolving the problem. Wallas's model is consequently appropriate in associating creativeness to problem solving, which is definitely a pattern that extends throughout a substantial amount of the creativity literature.

Figure 4.1: Wallas's (1926) Model for the Process of Creativity



Source: Adapted from Plsek (2006:2)

4.2.1 Preparation phase

The overall aspect associated with the preparation phase would be to facilitate data and information relating to the process. Circumstances are different, given that either an individual or a group could possibly facilitate the preparation. Space for putting together the amount of information and simple access is important. It is important for group participants to exchange frameworks by setting the common objectives. The facilitation area needs to accommodate as much information flow and assimilation as is practical to each participant. Devices such as laptops or computers, bulletin boards and basic access to information are essential simultaneously for individuals and groups. Public space appears necessary for groups. Often a non-public area is important for analysis,

both by individuals and group participants. The duration of this phase can differ, dependent on the time the group arrives at a barrier, exhaustion or terminates the assignment.

4.2.2 Incubation phase

Within the incubation phase, the cognitive functions are most often an individual or personal matter. Incubation can be achieved when individuals switch to different tasks and duties or merely unwind from the former task or assignment; nevertheless, the cognitive function of problem solving continues implicitly. Literary works on incubation exclusively refer to specific cognitive processes. Plsek cites Dorfman, Shames and Kihlstrom (1997) that cognition happens because perceptual clues are shared among team members (Hutchins, 1995:22). Certain creative individuals are better allowed to remain on their own within the incubation phase, while other people seek out companionship. Incubation is an implicit cognitive process; however, perceptual indicators could support the process. Remaining in the space wherein every piece of information from the preparation phase is organised and stored could enable such implicit understanding as an effective means of ‘priming’.

4.2.3 Insight phase

Insight (illumination) can be described as an ‘instant event' that happens the moment the winning idea shapes through the boundaries of consciousness. Reports of insights in many cases are described as idiosyncratic; additionally, it will not make a difference where it happens (Hadamard, 1945).

4.2.4 Elaboration and evaluation

Comprehensive assessment and examination is mandatory to be able to determine if the specified objectives and standards are satisfied. Contextually, this phase should resemble the preparation phase, since the functioning is identical. Whilst the preparation phase begins with a briefing, the elaboration and evaluation phases conclude with a debriefing and execution. Although it could be assumed that space could possibly enhance creativity, no aspects corroborate this assumption within the theories.

A great deal of cognitive work is situational: when the need arises, the need to act out the master plan and create various situational adjustments as problems manifest. Regularly, the unexpected happens rapidly that only automated reactions (Bargh & Barndollar, 1996:3) and emotional behaviour (Kristensen, 2006:91) tend to be swift enough. Creativity is a method that delivers new insights and knowledge from previously unrelated components of knowledge which are synthesized to bring newer insights through a psychological process.

Within the four phases of preparation, incubation, insight and verification, there are four sub-processes, superimposed into each of the primary phases of preparation, incubation, insight and verification that relate with one another in various ways. All of these sub-processes pass through the four phases of the Wallas model, although not equally intense. These particular sub-processes include:

- ***Value creation processes***: Value creation permeates the entire approach as the aim of creative endeavour. An essential component of innovation in business companies (Kristensen, 2004:92) cites Christensen (1997), the fact that processes transpire in adjacent co-operation with the value chains of the organisation. An innovation is often a redesign of value chains and when innovations tend to be isolated or accomplished independently of execution, implementation could possibly risk the innovation with no new value or exploitation is likely to be extracted.
- ***Scaffolding***: Scaffolding signifies a creative process is tailored within the context of space, equipment, human resources and data. These typically occur at the outset of the creative processes to be able to support the subsequent processes. Individuals navigate around within creative expanse similar to people navigating about in a landscape. At this point, a perceptual rehearsal is carried out (Ippolitto & Tweeney, 1995; Haugeland, 1995:236). This approach aids the process of imagination that will enable adjustments to concepts and embrace new paths. Moreover, the scaffolded surroundings will become an integral part of the creative brain, along with an implied ingredient that people merely question when problems are detected.
- **Imagination processes**: As part of the creative processes the ingenious is desired, that what never existed previously. Authentic imagination relates directly to unique ideas. Inside of a creative process, imagination could be intensive,

although over a brief timeframe. This notion of imagination (Brann, 1991; Johnson, 1987) represents the consolidation of knowledge towards defined and coordinated representations over time.

- **Materialisation** processes: The materialisation process changes ideas into tangible and physical objects. This indicates whenever opportunity presents itself an idea or concept ought to be transformed into physical objects. This is certainly in line with the embodied cognitive theory (Clark, 1997). Various cognitive processes are occasionally just conceivable once externalized. The absence of graphic indicators decreases the memory, despite the fact that memory techniques could improve memory ability. Brann (1991:282) affirms that memory is assisted in using space, and through internalizing occurrences inside a spatial temporary environment.

Table 4.1 displays the relationships between the primary and sub processes. These sub-processes work partially concurrently, and partially one of the processes dominates, depending on which phase of the Wallas model the sub-processes happen to be in.

Table 4.1: Wallas's Embodied Creative Process

	Preparation	Incubation	Insight	Elaboration and evaluation
Value creation	Guiding principle	Guiding principle	Guiding principle	Guiding principle and benchmark
Scaffolding	Physical organisation of process	Subject to altering and manipulation	No particular role	No particular role
Imagination	Perceptual rehearsal accumulates information	Perceptual rehearsal accumulates information	The moment of novelty	No particular role
Materialisation	Preparation includes tools for materialisation	No particular role	A new concept, solution or artefact is material or sensory	The material object or artefact is subject of elaboration and evaluation

Source: Kristensen, 2004. The physical context of creativity

Collins (2005:194) affirms the fact that Wallas's framework is considered the cornerstone for many creativity schools of thought and creativity education courses currently available. The introduction of incubation accompanied by unanticipated illumination as an element of this well-known framework would probably explain the reason many individuals consider creative thinking being a subconscious psychological function that is not forced.

Reference is made to the initial and concluding stages of Wallas's framework. The view in which creativity commences with meaningful preparation and concludes with vital verification indicates that creative and analytical thinking tends to be subservient, instead of counteractive. Creative individuals examine and evaluate; however, they have disciplined their impression mechanics to observe aspects which many may overlook. Creative thinkers validate and label, on the other hand anticipate unexpected situations and prevent judging too early.

Wallas's framework designed principles is the fact that creative thinking is a subconscious process that should not be instructed, and as a consequence creative and analytical thinking are supporting factors, and is mirrored in several other frameworks of creativity.

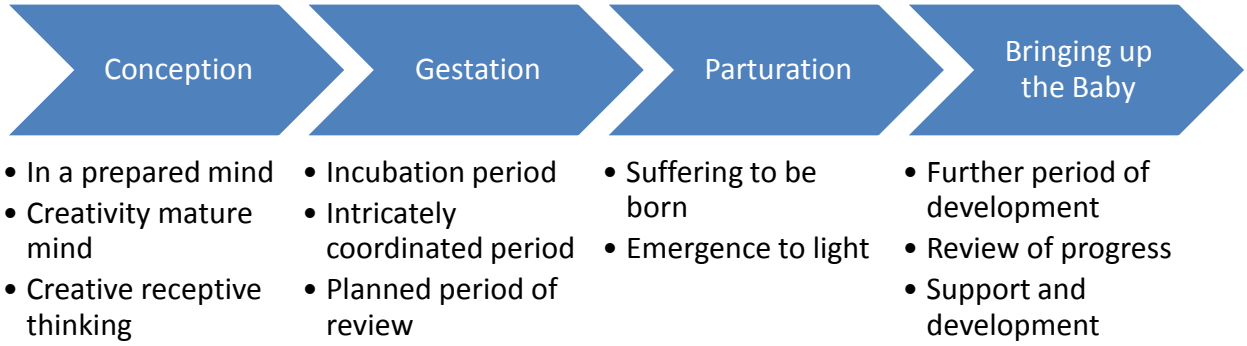
A bouquet of creativity designs and frameworks is dependent upon the principles of psychological mental steps and unrestrainable instances. Campbell (1960:384) and Simonton (1988:392) suggest that imaginative thought originate due to mostly unmanageable Darwinian approaches to random variation and natural choice. The primary thought is associated with what is called the "chance configuration theory" as far back as the 1880s with articles of scientist William James. Exclusively, the chance configuration model indicates that differences in ideas and configurations manifest by means of accidental opportunity. A case in point is the example that random factors were responsible for the mould that destroyed Alexander Fleming's science laboratory bacteria, resulting in the invention of penicillin. Likewise, accidental elements like the sticker burrs that hooked on a garment in a stroll in the forests, causing George de Mestral to channel these kinds of accidental instances to findings that resulted in the conception of Velcro (Plsek, 1997:2).

Preceding an opportunistic incident, Simonton (1988:387) and Campbell (1960:384) recommend that creativity continues by way of a natural choice procedure which selects and changes the random variations which happen to be best practical. Concluding the third and concluding step of the framework, the successful designer or inventor conserves and transforms a good number of ideas into tangible application. Even though these latter steps of selection and preservation are diagnostic, the crucial component of the framework is the fact that processes emanate as a result of chance. Simonton cites legendary instances of innovation (like penicillin and Velcro), along with historical self-reporting from impressive inventors like scientist Henri Poincare and Albert Einstein, to assert this framework (Plsek, 1997:2).

4.3 BARRON'S (1988) PSYCHIC CREATION FRAMEWORK

Barron (1988:76) attributes major focus on psychological and chance characteristics as part of his four-step, "psychic creation model."

Figure 4.2: Barron (1988) Psychic Creation Model



Source: Adapted from Plsek (2006:3)

Clearly, Barron's model reinforces the widely accepted perspective of creativity being a mystic undertaking associated with subconscious insights outside the specific command over the designer.

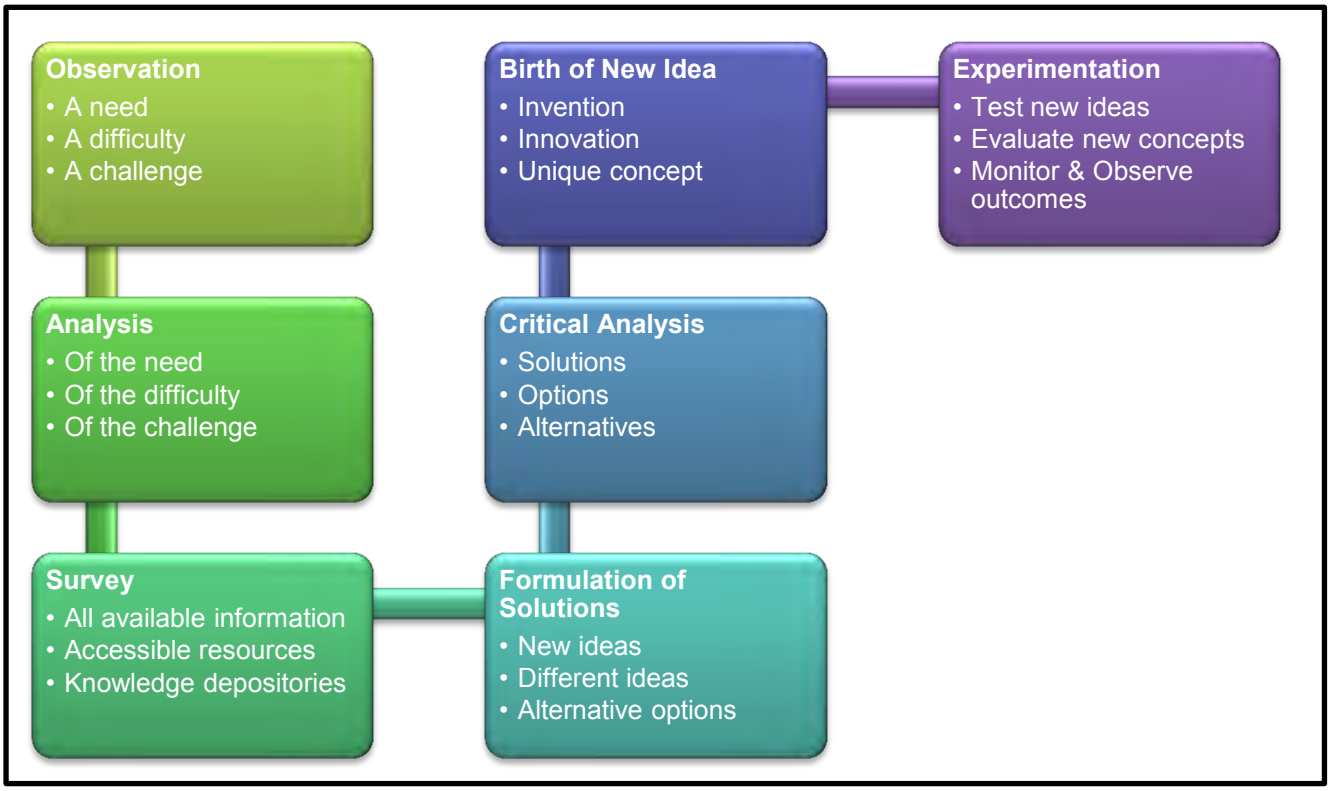
In comparison to the distinguished position which various frameworks share with subconscious workings, Perkins (2009:12) contends that subconscious psychological workings are associated with most thoughts and, subsequently, perform no exceptional function in creative thinking. Simply because most people are unable to thoroughly explain their thinking structure does not necessarily mean that most people may not be in command of their thinking. Furthermore, Perkins contends, that due to the fact that accidental incidences play a role in a number of activities of creation, this certainly will not automatically get to signify that accidental incidences are considered the trigger of many acts of creation. Weisberg's (1999:228) critique of many reputable creators and numerous significant invention milestones reinforces Perkins' perspectives by indicating many years of intended work and planning by the inventor (Plsek, 1997:3).

Even though several creativity designs and frameworks presents creativity as a rather enchanting technique, the prevalent frameworks direct more in the direction of ideals of unique designs originating through deliberate attempt to harmonize analysis and imagination.

4.4 ROSSMAN'S (1931) MODEL FOR CREATIVITY

Plsek (1997:3) cites that Rossman (1931) evaluated the creative processes through surveys submitted by 710 creators and inventors and additionally enhanced Wallas's initial four steps framework, by including three additional steps.

Figure 4.3: Rossman (1931) Creativity Model



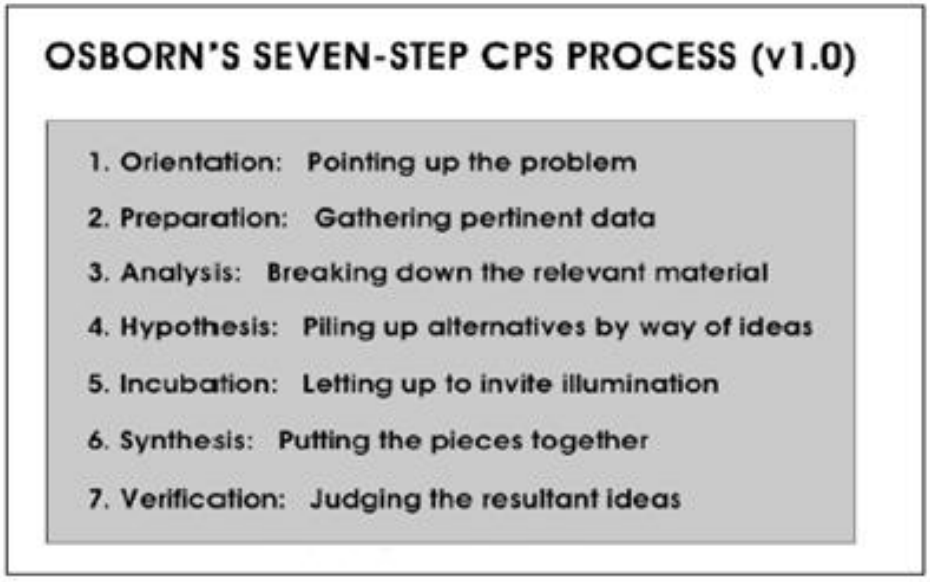
Source: Adapted from Plsek (1997:4)

Plsek (1997:3) observes the fact that although Rossman nonetheless encapsulates the "birth of the new idea" in mystical context, however, the stages prior and after this period of illumination can be clearly logical and diagnostic.

4.5 OSBORN'S (1963) CREATIVE THINKING SEVEN-STEP FRAMEWORK

Plsek (1997:4) comments that Osborn (1963), the creator of brainstorming, accepted an equivalent principle of equilibrium between analysis and imagination as part of his creative thinking seven-step model. Divergent thinking activities tend to be a prevalent factor for research on team creative problem solving, or brainstorming. The brainstorming literary mastery remains dominated by research which examines team performance by measurement of the sum total of constructed ideas utilising the initial principles developed by Osborn (1953). An assessment of empirical literary works on brainstorming implies that Osborn was correct regarding numerous assertions; however, deficiencies in some of his assertions were evident. Osborn encouraged withholding critique; nonetheless the particular benefits associated with conflict in interacting problem-solving teams have also been discussed. Integrating performance actions of idea quality, along with the pervasive measures of idea quantity, provides worthwhile and fascinating insight into group brainstorming.

Figure 4.4: Osborn's Seven-Steps Model (CPS Version 1.0)



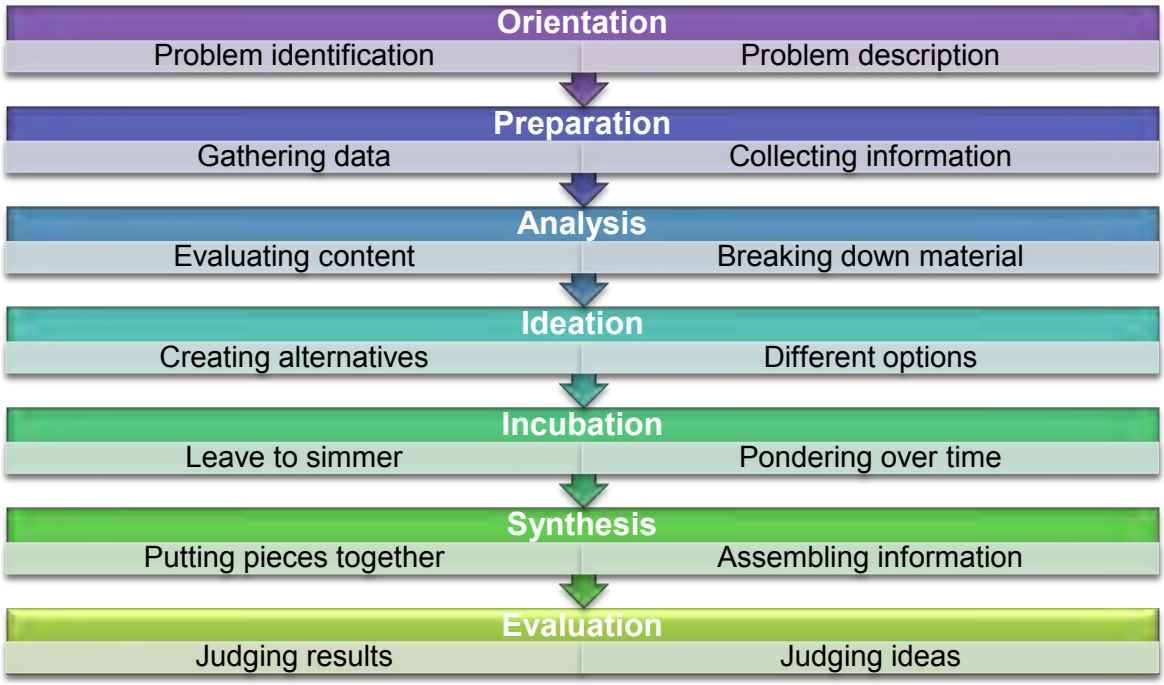
Source: Osborn's Applied Imagination, 1953

Osborn (1963:129) contended that the crucial element for a productive brainstorming activity is definitely quantity of ideas. Basing the technique along the premise that the improved quality of ideas tends to be generated at a later time, as opposed to earlier within the brainstorming session, as in the initial stage of brainstorming many ideas broad ideas are presented. Osborn's reasons were that individuals initially ought to

purge the mind of typical, common ideas prior to uncovering or developing better authentic, creative solutions to problems. Therefore, producing a lot more ideas boosts the probability that high-quality ideas will undoubtedly be included amidst the quantity of ideas (Osborn, 1957, 1963). Many of these intuitions were subsequently supported by empirical verification of significant positive correlations involving the final number of ideas along with the volume of hugely authentic and functional ideas, despite the fact that more modern methods describe this outcome as a lot more of an artefact of probability in sampling, or perhaps an equal-odds rule, so that bigger samples of ideas will certainly consist of greater creative responses (Simonton, 1990).

Brainstorming generally seems to be much more effective whenever specified objectives and outcomes for brainstorming sessions are established beforehand. However, a number of other assumptions regarding the usefulness of brainstorming were not endorsed. Most significantly is that there is very little verification and evidence in support of Osborn's (1953, 1957) theory with regards to the superiority of team brainstorming above individual creative idea creation. Nevertheless, as Paulus and Brown (2003:114) emphasises, that Osborn (1963) amended the initial assertion and advised that team collaboration is most effective exclusively as a complementary activity to individual brainstorming.

Figure 4.5: Osborn's (1953) Seven-Step Creative Thinking Model



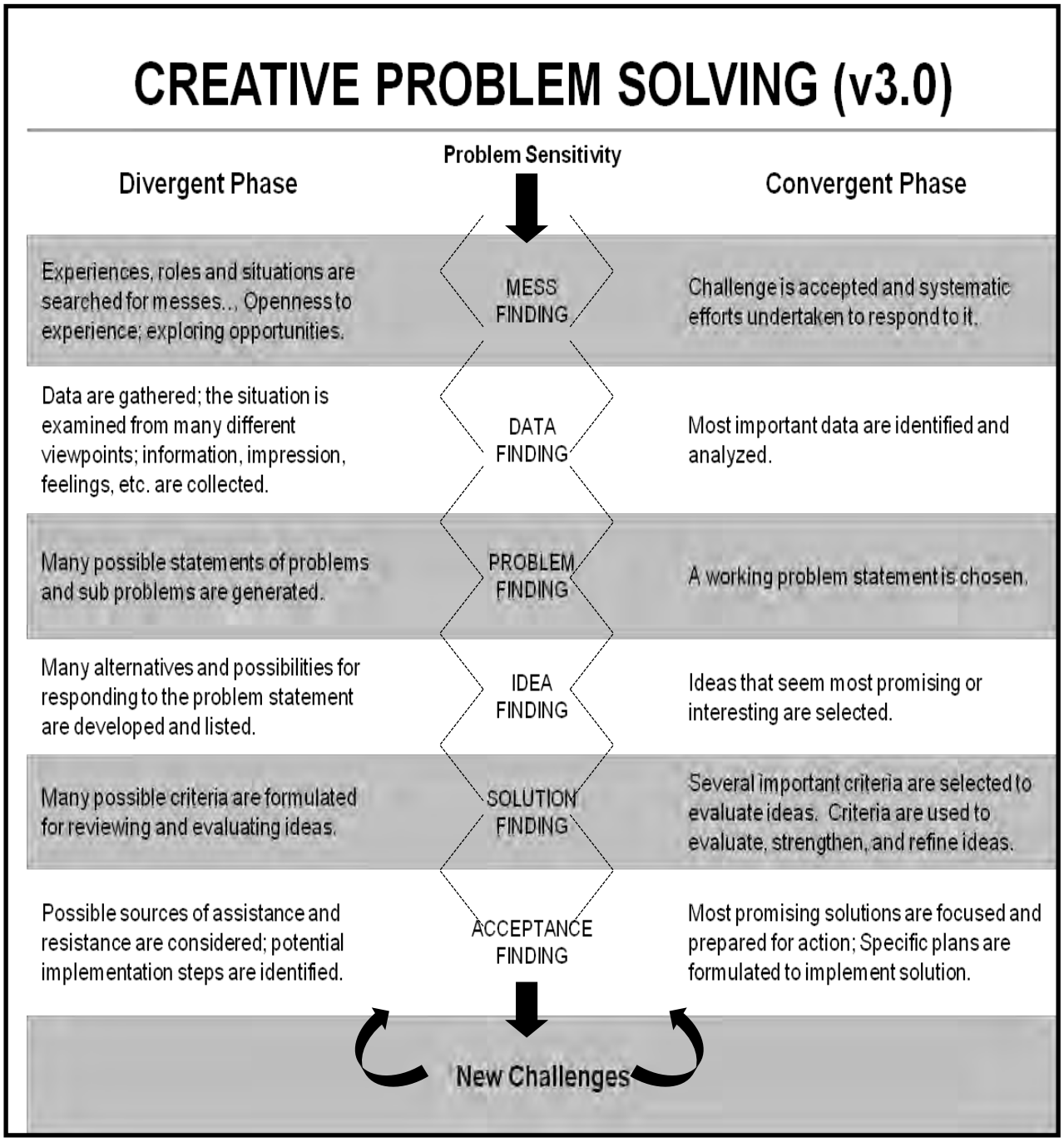
Source: Adapted from Plsek (2007:4)

Plsek (1997:4) comments in that Osborn intended meaningful ideation throughout the thinking of "gathering alternatives"; furthermore, Osborn's creation regarding the guidelines of brainstorming as being an instrument for accomplishing this. A deliberate blend of approaches for planned creativity and methods for examination remains a robust pattern in numerous recently proposed models.

4.6 OSBORN & PARNES' CREATIVE PROBLEM SOLVING (CPS) MODEL (1985)

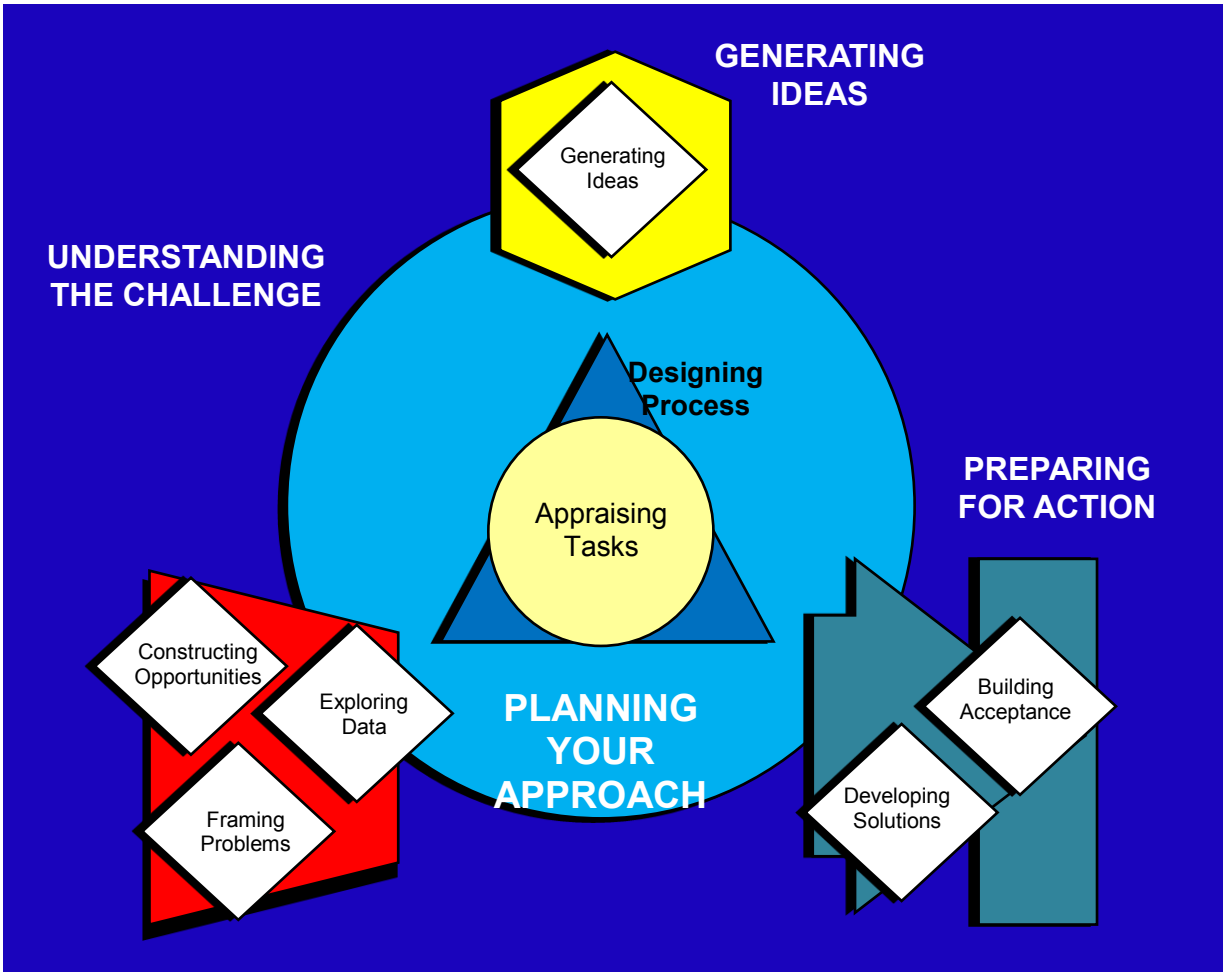
CPS is a framework intended to capture the importance of the entire creative process. Applying this technique, creativity thought patterns could be deliberately ascribed to deal with unrestricted problems. CPS can be described as a structured technique which can be used to boost creative thinking in many people. Considering the applied positioning of the framework, it is not unexpected that the CPS model was developed by a businessman Alex Osborn (Puccio *et al.,* 2006:20) for business intent further characterising CPS as being a technique composed of three processes: Fact-Finding, Idea-Finding, and Solution Finding. It is very important to distinguish between CPS and Brainstorming. CPS is an accomplished framework intended in making precise steps active in the creative process. Brainstorming is really a specified application intended to boost divergent thinking in teams and groups. Brainstorming is one among numerous instruments that happen to be integrated into the CPS process. Thus the CPS model provides a structure for coordinating instruments which might be applied to execute a selection of exercises linked to the creative process. Brainstorming has long been used as a fundamental guide in order to assist teams and groups participate in beneficial idea generation; nevertheless, various other instruments are used linked to the different steps throughout CPS.

Figure 4.6: Isaksen and Treffinger CPS Version 3.0



Source: Isaksen and Treffinger, 2004:9.

Figure 4.7: Isaksen and Treffinger CPS Version 6.1



Source: Center for Creative Learning and Creative Problem Solving (2000)

Understanding the challenge entails examining a diverse objective, alternative, or challenge, and making clear, forming, or centring the reasoning setting the primary path for work. By using and employing several of the three phases as part of comprehending the challenge when it is required to investigate and concentrate on contemplating purpose, targets, or the setting of direction. *Constructing opportunities* is declaring wide-ranging, concise and worthwhile options and objectives. Contemplating potential possibilities and obstacles, and selecting a beneficial objective to follow. *Exploring data* is evaluating numerous resources of information coming from a variety of perspectives, and additionally concentrating on the most crucial components of the job or scenario. Deciding on precisely what is understood in regards to the scenario as well as precisely what is required to arrive at the core of the situation. *Framing problems* is producing various different and uncommon approaches to frame the challenge, after which concentrating on a selected argument designed to unveil and encourage creative suggestions occurs.

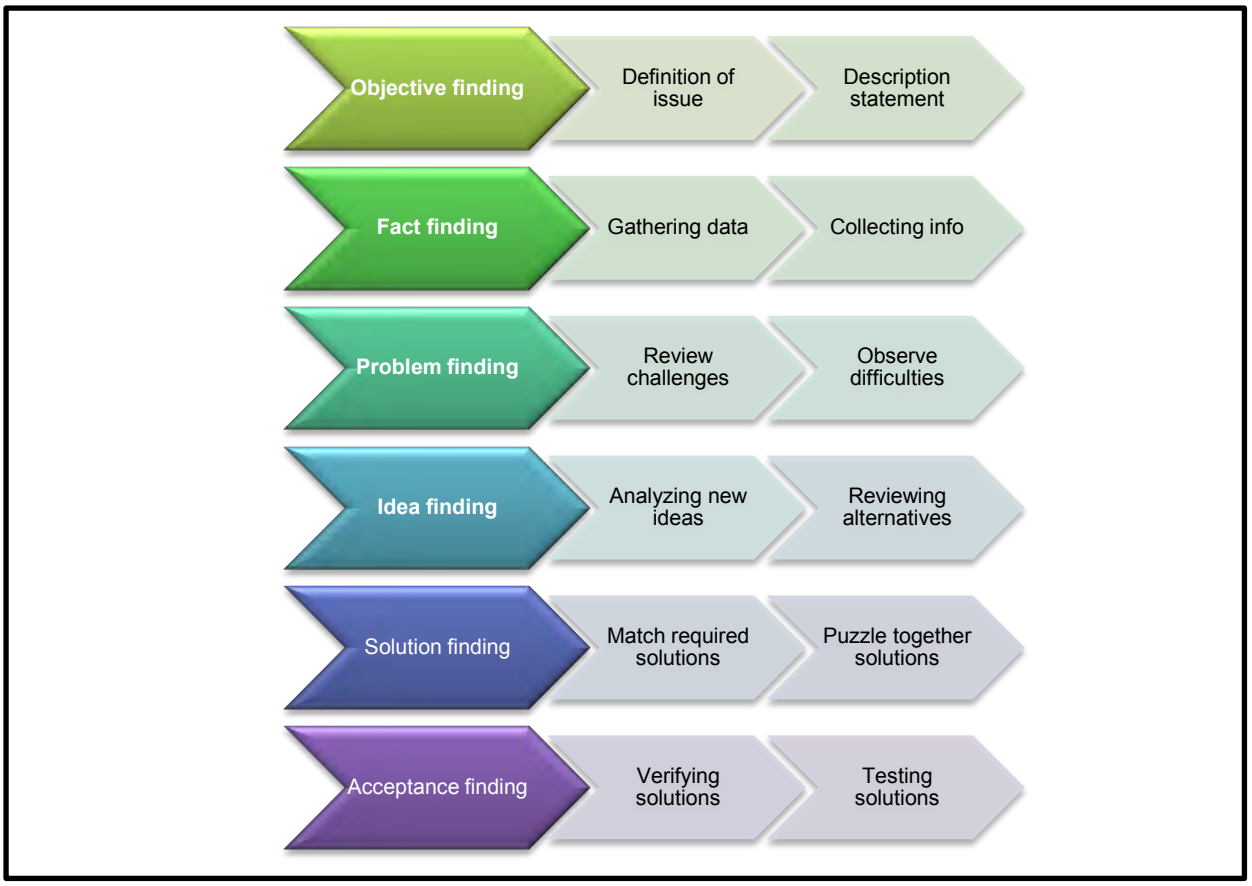
Generating ideas, containing a single phase, entail discovering numerous newer prospects, which are regarded by many individuals as being creative, that in some instances are incorrectly associated to brainstorming. Generating ideas is simply one element and phase amongst many others in CPS. Generating ideas normally is an unbarred pursuit or search for ideas, through which numerous ideas will be produced (fluency of thinking), and uncommon or unique ideas (originality), after which targeting the reasoning by recognizing ideas with worthwhile or possibly stimulating possibilities to hone, build and practically apply.

Preparing for action consists of discovering tactics to reach encouraging alternatives towards practical possibilities and finding your way through effective execution. Generating good alternatives and building these alternatives to ensure that they are rigid, in order to create most effective potential for success. *Developing solutions* by means of deliberate strategies and approaches to evaluate, build, and hone promising opportunities, in order to convert these towards appealing solutions. *Building acceptance* is contemplating approaches to establish support in order to diminish or address resistance to potential alternatives, and preparing chosen approaches to execute and examine outcomes and performance.

Planning the approach requires to monitor the thinking whilst it is occurring to be certain that the intended results are typically progressing in the specified direction. In addition it directs the modifying or personalising of the tactic in making use of CPS. *Appraising the task* is checking whether or not CPS is actually a good selection for managing a specific task, and reflecting on the engagement, restrictions and conditions that should be contemplated in making use of CPS proficiently. *Designing process* is applying the understanding of the work along with the demands to organise the CPS elements, phases, or instruments most suitable in support of reaching the goals.

Plsek (1997:4) cites Parnes (1992), Isaksen (1985) and Trefflinger (1985) in defining six stages in the widely used creative problem solving (CPS) framework. The world renowned CPS model and its associated tools and techniques are explicitly used at conferences directed in Buffalo, New York through the Creative Education Foundation.

Figure 4.8: Parnes, Isaksen and Trefflinger CPS model



Source: Plsek (1997:4)

Stage 3 (problem identification) and stage 4 (idea finding) undoubtedly demand unique, imaginative reasoning; whilst stages 1, 2, 5, and 6 demand conventional expertise and investigative consideration.

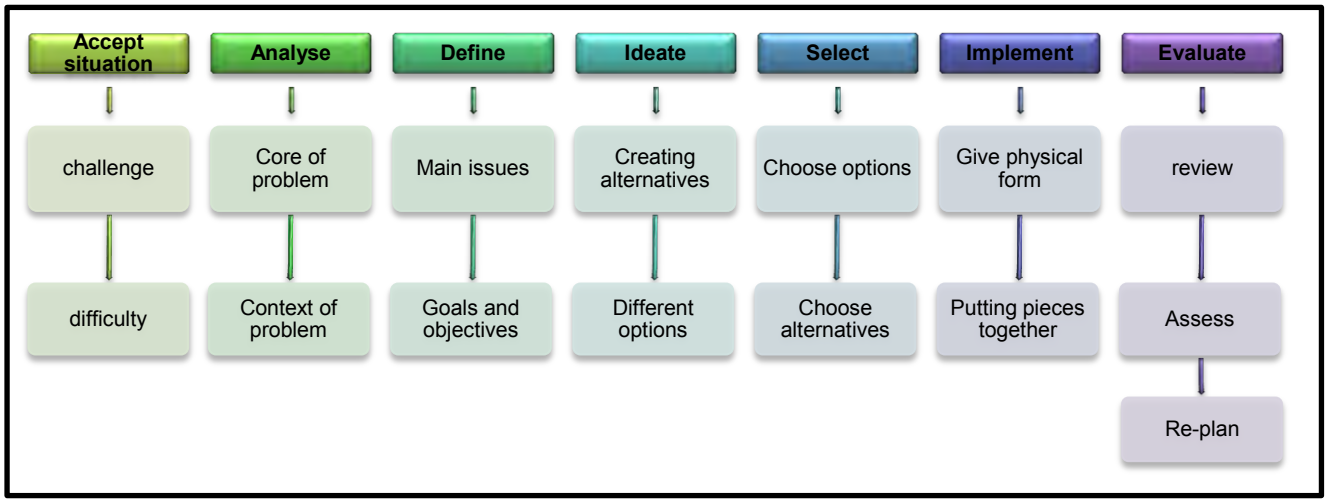
Puccio *et al.* (2006:22) suggest that modifications to the CPS framework having occured progressively and can be found within the literary work of Noller, Parnes, and Biondi (1976); Isaksen and Treffinger (1985); Isaksen, Dorval and Treffinger (1994); Basadur (1995); Miller, Vehar, and Firestien (2001), and Isaksen and Treffinger (2004). Even though a variety of authors provide different views of CPS, there have been two fundamental attributes that existed throughout just about all approaches. Initially, the CPS process consisted of several actions which capture the essential functions related to the creative act, specifically the necessity to define problems, generate ideas, transform ideas into solutions, and construct action plans. Secondly, all CPS frameworks demonstrate an equilibrium relating to divergent (delivering a varied collection of alternate options) and convergent thinking (assessment, choosing and assessing alternate options) in each and every stage within the process. This particular

vibrant equilibrium between divergent and convergent thinking remains the trademark of CPS.

4.7 KOBERG AND BAGNALL'S (1981) UNIVERSAL TRAVELER MODEL

Plsek (1997:4) cites that Koberg and Bagnall (1981) advocate an equivalent well-balanced framework in their work captured in *The Universal Traveler*. Creative problem solving, an important component of developing cultural synergy, involves placing an existing challenge in a different perspective. As stated by Koberg and Bagnall (1981:10), "individuals grow to be increasingly more creative merely by getting more mindful of exactly what they generally undertake and the way this connects to their surroundings." Learning to be attentive to processes and systems facilitates the average person becoming a lot more accurate in anticipating how to proceed.

Figure 4.9: Koberg and Bagnall Universal Traveler



Source: Adapted from Plsek (2006:5)

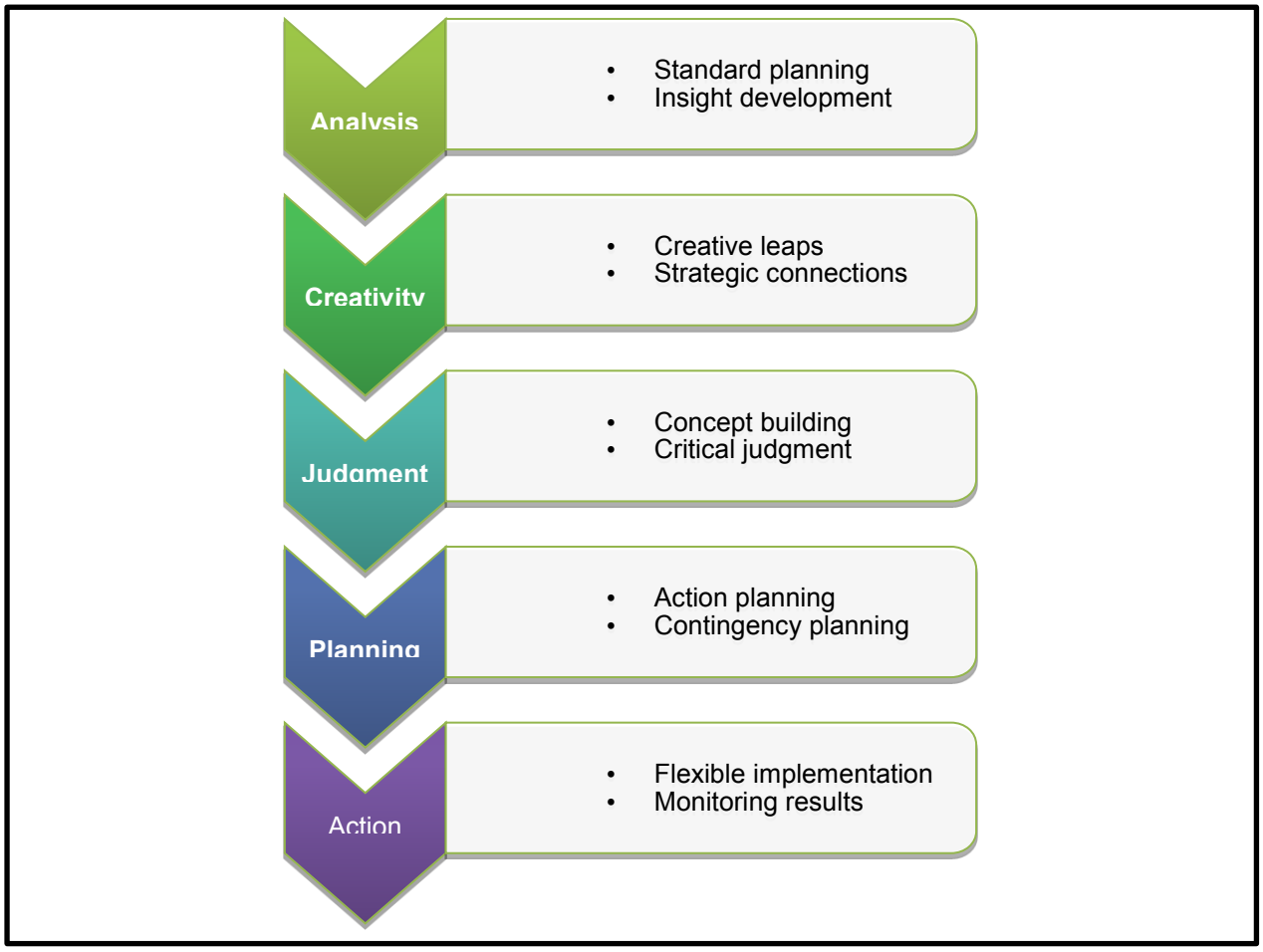
Once again, observe that ideation, the conventional focus of creativity thought methods, particularly brainstorming, is in fact proceeded and accompanied by purposeful analytical and realistic thinking. Likewise observe the significance which Koberg and Bagnall put on the subject of acknowledging the circumstance to be a personalised challenge making this consistent with all the study and analysis of extraordinary inventors that illustrates the significance of paying attention to newness and being compassionate (Weisberg, 1993; Wallace & Gruber, 1989; Gardner, 1994; Ghiselin,

1952 in Plsek, 1997). Finally, observe that the concluding stage of this framework is cementing the thinking of progressive creativity (Plsek, 1997:5).

4.8 CREATIVE STRATEGIC PLANNING MODEL (1985)

The notion of imaginative and investigative balance is transmitted to creativity frameworks recommended by Plsek (1997:5) in the work of Bandrowski (1985) for chosen methods detailing the approach to creative strategic planning.

Figure 4.10: Bandrowski's Creative Strategic Planning



Source: Adapted from Plsek (1997:6)

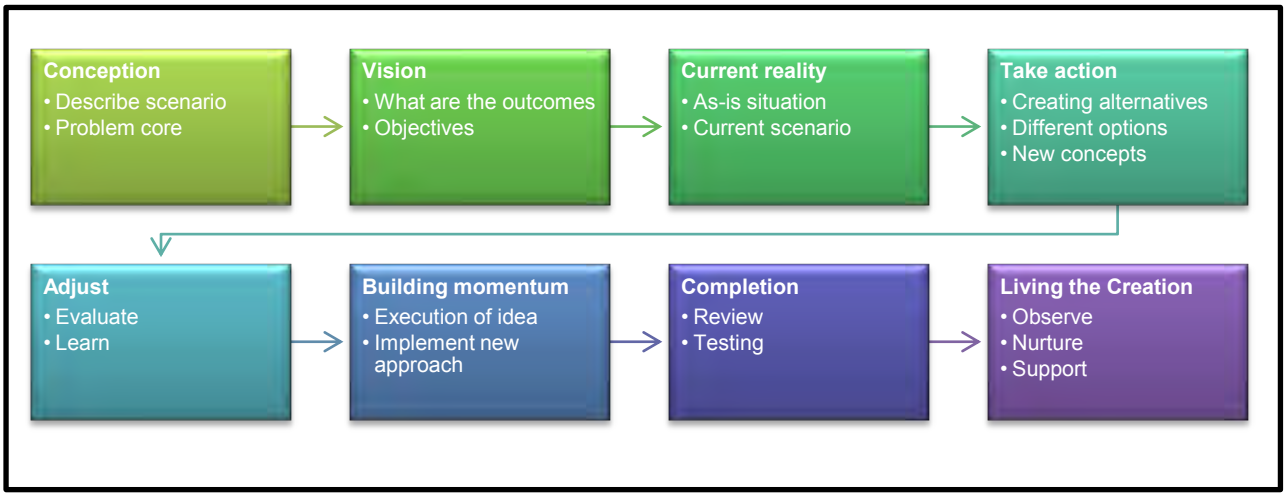
Attention is directed to the favourable activity of judgment within this framework along with the importance towards the application of certain creative abilities in perceptiveness and developing key insights, inventive advances, and in addition constructive contingency provision.

In addition Plsek (1997:5) states that one must always observe that you cannot assume all frameworks position the creating of new techniques as the catalyst for analytical thinking.

4.9 ROBERT FRITZ'S (1991) PROCESS FOR CREATION

Plsek (1997:6) affirms that the Fritz process for creation specifies the start of the approach as the creativity actions of conception and vision, accompanied by evaluation of current reality, action, adjustment, awareness (building momentum), and completion. Fritz likewise strongly affirms that the creative approach is cyclical. "Living with your creation" signifies meaningful observation and evaluation, leading to the further progressive conception and vision.

Figure 4.11: Fritz's Process for Creation



Source: Adapted from Plsek (1997:6)

Needless to say, some of these fashionable frameworks regarding the entire process of creativity thought happen to be sophisticated guidelines for advanced reasoning. Irrespective of the particular framework chosen, rigorous questioning and analysis over an extended time period is required. The level of difficulty implied through this balanced exercise is most likely the reason that creative ideas are incredibly rare. Despite the fact that most people hold an underlying flaw for psychological foundations for creative

thinking, piecing these psychological foundations and blocks together in the correct formation is hard work (Plsek, 1996).

In conclusion, Plsek (1996) outlines the persistent concepts that cut across the various models and frameworks in that:

- The creative process involves meaningful assessment, resourceful idea production, and crucial appraisal – the overall creativity approach is regarded as an equilibrium of creative thinking and analytic thinking.
- More mature models are inclined to indicate that creativity is a consequence of psychological activities, normally beyond the control of the thinker. Contemporary frameworks frequently indicate meaningful production of fresh ideas, within the drive and control of the initiator.
- Overall, creativity approaches necessitates a thrust to execute along with the application of ideas. Individuals should do more than merely envision new things; they need to strive to ensure these new things become tangible activities.

Many of these observations with the evaluation of numerous frameworks and models of creativity thought patterns need to be stimulating. Dedicated entrepreneurs and commercial persons usually display robust skills in functional, technical, factual, and diagnostic reasoning. In contrast to favoured opinion, present day principles of creativity place no requirements on individuals to abandon their expertise and skills. Specific needed, is to complement these skills and expertise along with various innovative thinking abilities to complement the production of unique ideas and insights. Many of these observations coming from the traditional frameworks of creativity thought patterns are designed to question and stimulate.

Importantly, people should also develop the psychological guidelines to harmonize and guide many of these cutting edge thinking methods in collaboration with classic ones. Whenever individuals can accommodate these challenges, they are empowered to guide and direct organisations and cement competitive advantage through innovation (Plsek, 1997:6).

4.10 O'NEILL AND SHALLCROSS 5 R's MODEL (1994)

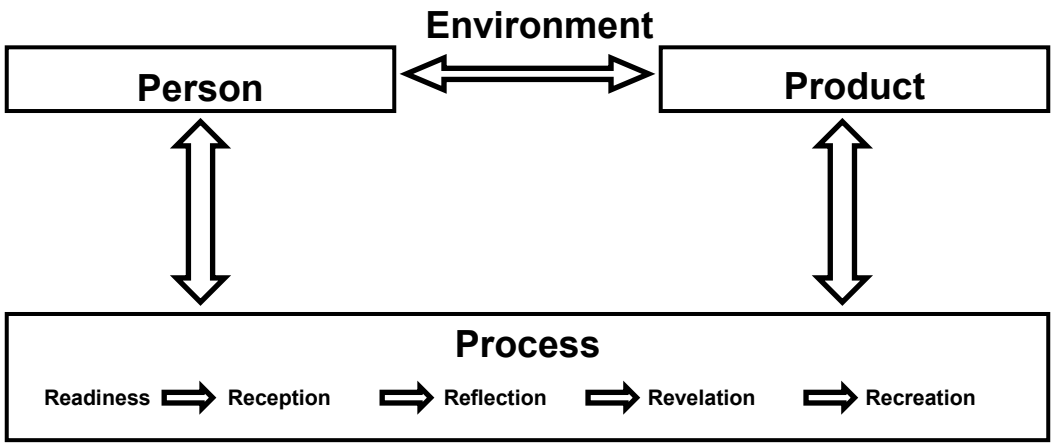
The Sensational Thinking model of O'Neill and Shallcross (1994) distinguishes away from alternative models given that it defines perception as being a natural manifesting dynamic method inside of the creative routine, by detailing five stages (5Rs) (Hasirci & Demirkan, 2003:262). This is particularly significant given that it enables the connection between cognition and creativity by providing the connection relating to the 5Rs Model of Sensational Thinking, and the 4Ps model of creativity which symbolizes the imaginative approach to making decisions by focusing on its stages. Within every single stage, thought construction along with the aspects of the ways this can be done happen to be important. The Sensational Thinking model characteristics will be strongly associated with the dynamic disposition of design processes (Hasirci & Demirkan, 2003:262) states that the Sensational Thinking 5Rs is customised with regard to the perspective of design literary works in the following ways:

1. ***Readiness***: pleasure exercise that demands surrendering as well as remaining ready to accept the variety of alternatives. Preparation, analysis, and initial idea conception are visible during this stage. Entails greater imagination than merely description, together with searching for creative concepts and observing the work carefully.
2. ***Reception***: experiencing thoroughly and examine while using the sensory faculties. Imagination, generation, idea selection, or refinement is clear at this point. Alternating and changing the problem dynamics is an essential element of creativeness that occurs (Akin & Akin, 1998:126).
3. ***Reflection***: recalling actions and permitting period of time for inner interaction. A phase when harvesting, evaluation, idea development, enriching and growing breakthrough occurs in order to groom an individual towards the subsequent phase. The individual could possibly switch between intense periods of imagination and representation during this period, and as soon as a decision is selected amidst alternate options, the subsequent phase has commenced (Jones, 1993:137; Kristensen, 2004:90; Ulusoy, 1999:123; Von der Weth, 1999:455).
4. ***Revelation***: concentrating and sequence identification. This specific stage requires the individual to organise for the instant as soon as a new idea eventually surfaces. The individual strengthens and improves the concept or solution prior to the concluding stage beginning. The moment the elementary

form of the completed representation of the activity commences, a person has moved into the final phase (Akin & Akin, 1998:126; Jones, 1993:137; Kristensen, 2004:91).

5. ***Recreation***: To ascertain complete communication material and communicate through several modes, the individual verifies and manages the final representation for incomplete elements, completes and resolves (Jones, 1993:137; Kristensen, 2004:92; Ulusoy, 1999:123). Specific behaviour patterns which determine the conclusion of a single stage along with the start of another stage are anticipated to happen at each and every stage. Lastly, recreation tends to be identified by the development of ideas together with the finality of details. During all of these phases, psychological imagination and external representation occurs in a variety of proportions, which are important in comprehending the creative process.

Figure 4.12: O'Neill and Shallcross 5Rs Model

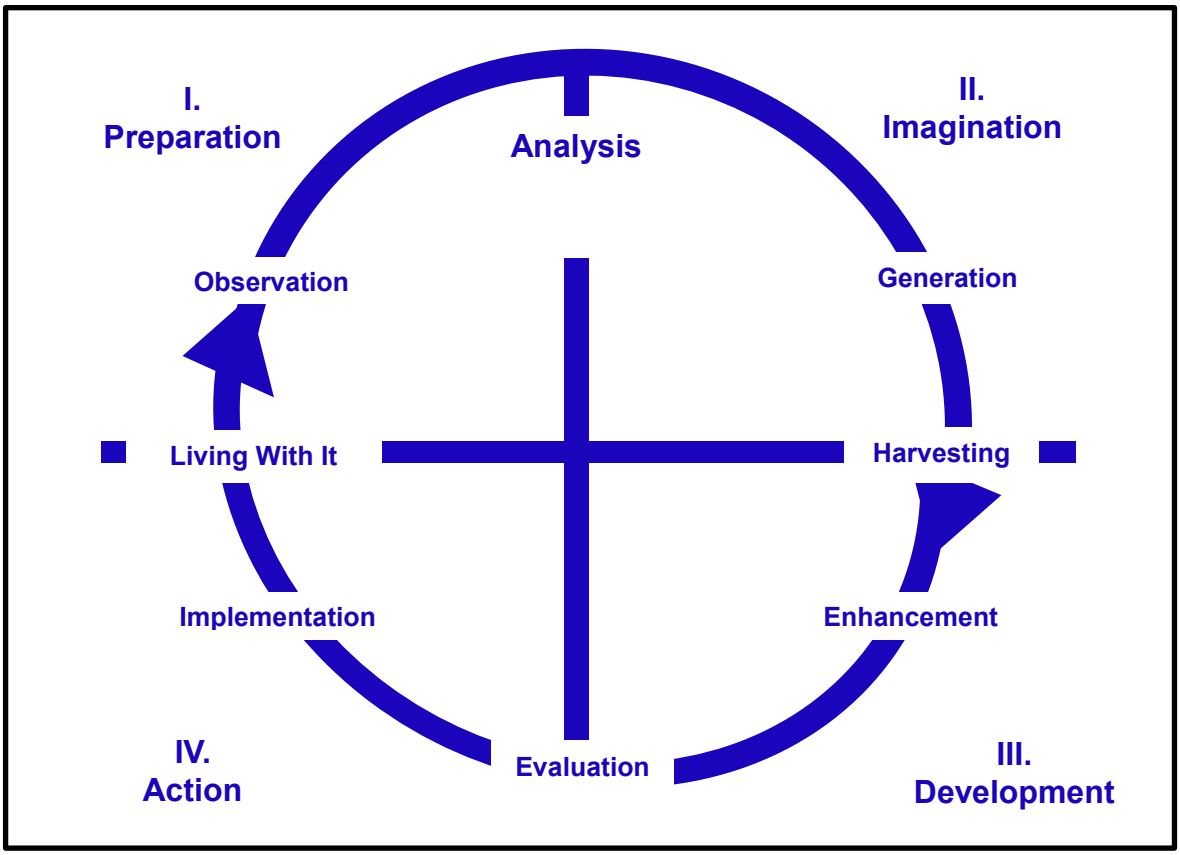


Source: Hasirci & Demirkan, 2003

4.11 THE DIRECTED CREATIVITY CYCLE (1996)

Plsek (1997:7) developed the Directed Creativity Cycle, as a framework of creativity thought patterns that blends and integrates many principles associated with the numerous frameworks and models recommended throughout the last century.

Figure 4.13: Plsek Directed Creativity Cycle



Source: Plsek Working Paper: Creativity Models, 1997

Commencing with the *Living With It* quadrant, Plsek demonstrates that people exist day-to-day in an identical universe as all others, although creativity thought patterns commence with meticulous observance of their universe combined with attentive investigations of specifically the ways things function and do not succeed. Most of these psychological activities generate a database of information within the memory. Employing this database, most people construct unique ideas to fulfil specified requirements by purposefully seeking connections within configurations. Generally quite a few focused methods exist that individuals could use to build some associations. The selection of technique or method is probably unimportant; purposefully seeking out these connections is critical.

Attention should be given to pursuing equilibrium amidst a satisfying and untimely environment, and to reap and furthermore boost ideas prior to subjecting ideas to a conclusive end state. However, it is not sufficient to have imaginative thoughts; ideas do not have any benefit up to the point where it is put to work and implemented. Every

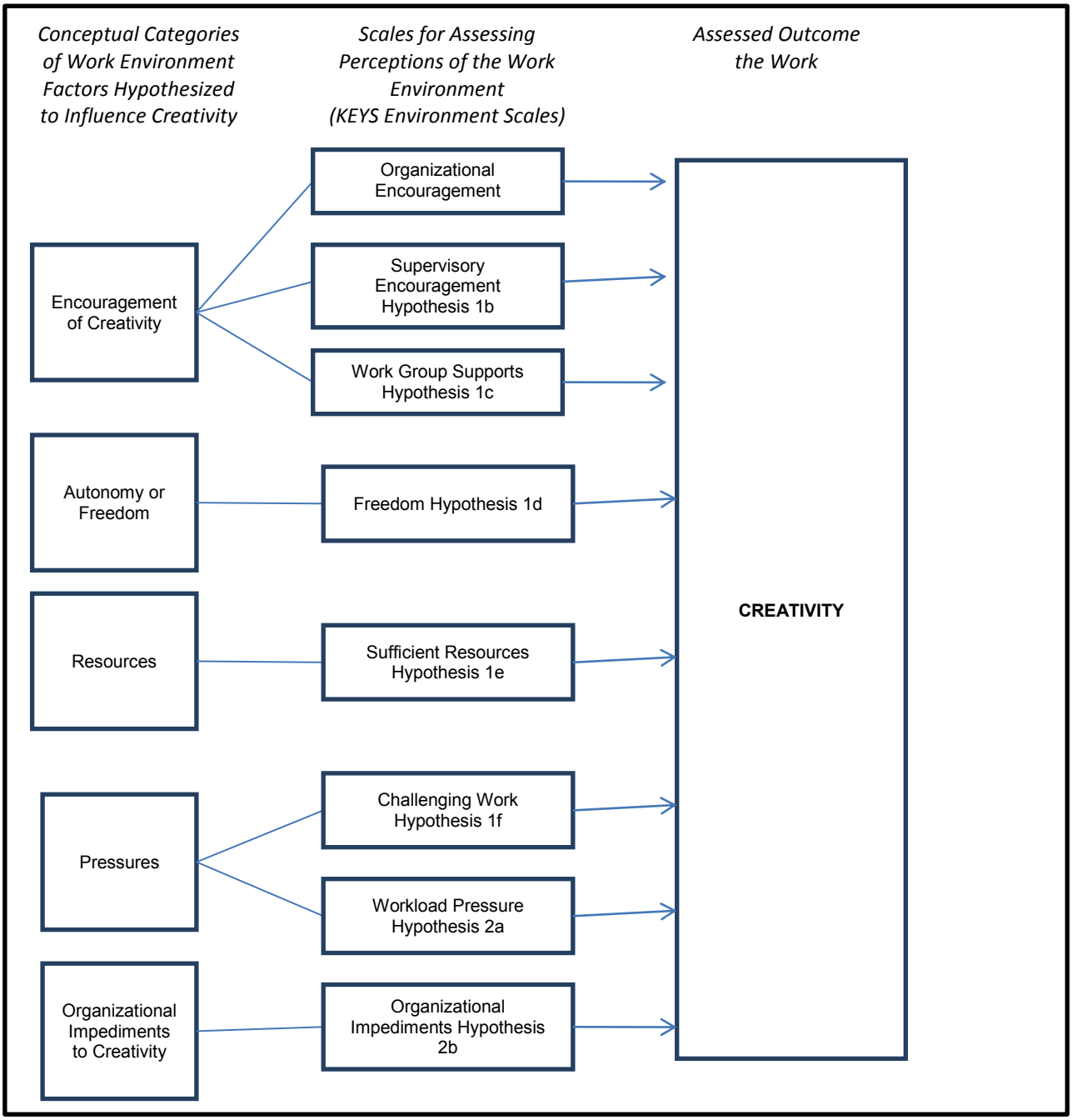
single different idea that will be applied modifies the universe, that in-turn re-ignites the spiral of reflection and evaluation.
Purposeful and meaningful creativity merely suggests that individuals build meaningful psychological movements to counteract the dangers related to the cognitive mechanisms every single step of this process of exploring unique and beneficial ideas.

Plsek (1997:) further divides this framework into four stages and applies the four stages of Preparation, Imagination, Development, and Action to organise the many elements of deliberate creativity in various other research articles. The Plsek framework furthermore intentionally abstains from taking sides in controversial debate of whether imagination is a mindful or psychological mental capability. Even though Plsek personally believed in imagination being a mindful, un-enchanting psychological activity, the action of "generation" in the framework embraces creative ideas notwithstanding the origin. Finally, observe that the framework undoubtedly reinforces the thought that invention is an accomplished stage past the basic production of creative ideas. The Action stage of the framework clarifies that creative ideas have worth on condition that these are generally executed in real life.

4.12 THE WORK ENVIRONMENT SCALES (KEYS) (1996)

Amabile *et al*. (1996:1155) state that the Work Environment Scale (WES) (Insel & Moos, 1975) evaluates staff members' impressions of numerous diverse dimensions regarding day-to-day job environments, although none of these applications exclusively concentrates on the organisational landscape with regard to creativity. In fact, merely one psychometric tool has been developed for this particular reason (apart from KEYS), and recorded within academic literary works, namely the Siegel Scale of Support of Innovation (Amabile *et al.,* 1996:1156). Individuals become more creative while they are typically fundamentally motivated, based on the interest, happiness gratification, as well as challenge of the job. This essential motivation may be compromised through accidental motivators which encourage individuals to experience external control in their work (Amabile, 1988:124; 1993:188). **Figure 4.15** explains the conceptual model underlying the assessment of perceptions within the workplace and the resulting influence or impact on creativity.

Figure 4.14: Conceptual Model Underlying Assessment of Perceptions of the Work Environment for Creativity



Source: Amabile *et al.,* 1996:1159. KEYS*: Assessing the climate for creativity.*

4.12.1 Encouragement of creativity

This particular aspect happens to be, undoubtedly, the widest as well as the most commonly stated within the literary works. Encouragement around the building and advancement of new ideas generally seems to function on three important levels within companies. Firstly, organisational encouragement, seems popular within written material; and the second and third respectively (supervisory encouragement and work

group encouragement) are generally discussed more infrequently. Scales expected as being positively associated with creativity are generally labeled as “stimulant scales” while others expected to be adversely associated tend to be labelled as “obstacle scales” (Amabile *et al.,* 1996:1159).

4.12.2 Autonomy or Freedom

Numerous researching experts have determined that creativity is cemented whenever people and groups enjoy reasonably higher independence during the everyday performing of work together with a feeling of ownership as well as influence around their personal jobs and work in addition to their very own suggestions (Bailyn, 1985:130; King & West, 1985; Paolillo & Brown, 1978:12; Pelz & Andrews, 1966; West, 1986). Research on creativity has disclosed that people generate greater creative effort at the time they experience themselves to possess preference when performing the activities which they are required to do (Amabile & Gitomre, 1984:210).

4.12.3 Resources

Quite a few research workers suggest that resource deployment to assignments happens to be closely connected to the assignments’ creativity levels (Cohen & Levinthal, 1990:132; Damanpour, 1991:555; Delbecq & Mills, 1985:28; Farr & Ford; 1990:70; Kanter, 1983; Payne, 1990:102; Tushman & Nelson, 1990:2). Apart from the most apparent functional constraints that severe resource limitations put on what individuals may achieve within their functions, awareness from the adequacy regarding resources could influence individuals psychologically simply by triggering opinions regarding intrinsic value concerning the assignments they may have undertaken.

4.12.4 Work pressures

A small number of researchers have yielded conclusions strongly related to the issue of the consequences of pressure on creativity within companies. The data that can be found indicates relatively paradoxical influences. Some investigation features, that even though workload pressures that had been regarded intense may weaken creativity, some amount of pressure may have a positioning impact whenever it had been regarded as a result of the urgent, intellectually difficult nature around the challenge

itself (Amabile, 1988:124; Amabile & Gryskiewicz, 1987). Likewise, Andrews and Farris (1972:188) discovered that time period pressure ended up being commonly connected to higher creativity in R & D professionals, with the exception of whenever the pressure level climbed to unacceptable advanced levels.

4.12.5 Organisational impediments to creativity

An organisational culture obstructs creativity by means of inner political complications, severe critique of new ideas, damaging internal competition, some kind of avoidance of risk, along with an overemphasis on the status quo.

Table 4.2 outlines the various KEYS scales (stimulant scales, obstacle scales, criterion scales) with associated implications within an organisation.

Table 4.2: Work Environment for Creativity KEYS scales

Scale Name	Number of Items	Description	Sample Item
Stimulant scales organisational encouragement	15	An organisational culture that encourages creativity through the fair, constructive judgment of ideas, reward and recognition for creative work, mechanisms for developing new ideas, and active flow of ideas, and a shared vision of what the organisation is trying to do.	People are encouraged to solve problems creatively in this organisation.
Supervisory encouragement	11	A supervisor, who serves as a good work mentor, sets goals appropriately, supports the work group, values individual contributions, and shows confidence in the work group.	My supervisor serves as a good work mentor.
Work group supports	8	A diversely skilled work group in which people communicate well, are open to new ideas, constructively challenge each other's work, trust and help each other, and feel committed to the work they are doing.	There is free and open communication within my work group.
Sufficient resources	6	Access to appropriate resources, including funds, materials, facilities, and information.	Generally, I can get the resources I need for my work.
Challenging work	5	A sense of having to work hard on challenging tasks and important projects.	I feel challenged by the work I am currently doing.
Freedom	4	Freedom in deciding what work to do or how to do it; a sense of control over one's work.	I have the freedom to decide how I am going to carry out my projects.

Obstacle scales organisational impediments	12	An organisational culture that impedes creativity through internal political problems, harsh criticism of new ideas, destructive internal competition, an overemphasis on the status quo.	There are many political problems in this organisation.
Workload pressure	5	Extreme time pressures, unrealistic expectations for productivity, and distractions from creative work.	I have too much work to do in too little time.
Criterion scales Creativity	6	A creative organisation or unit, where a great deal of creativity is called for and where people believe they actually produce creative work.	My area of this organisation is innovative.
Productivity	6	An efficient, effective, and productive organisation or unit.	My area of this organisation is effective.

Source: Amabile *et al.* (1996:1166). KEYS*: Assessing the climate for creativity.*

KEYS (Amabile *et al.,* 1996:1178) was developed to present a trustworthy and legitimate examination of elements of organisational work environment perceptions which are inclined to impact the construction and advancement of creative ideas. KEYS' content was developed to deal with almost all negative and positive facets of the work environment outlined within the KEYS literary works. KEYS had been designed to function as an application for research and theory advancement, especially for scholars involved in comprehending contextual influences on creative behaviour in the workplace. Particularly, scholars using this particular application within their studies ought to generate more descriptive understanding of the ways wherein the workplace perceptions may impact the creativity level of assignment outcomes. KEYS has also been developed to function as an instrument for professionals keen on the diagnosis of the extent that an organisation's workplace encourages creative effort within people and teams.

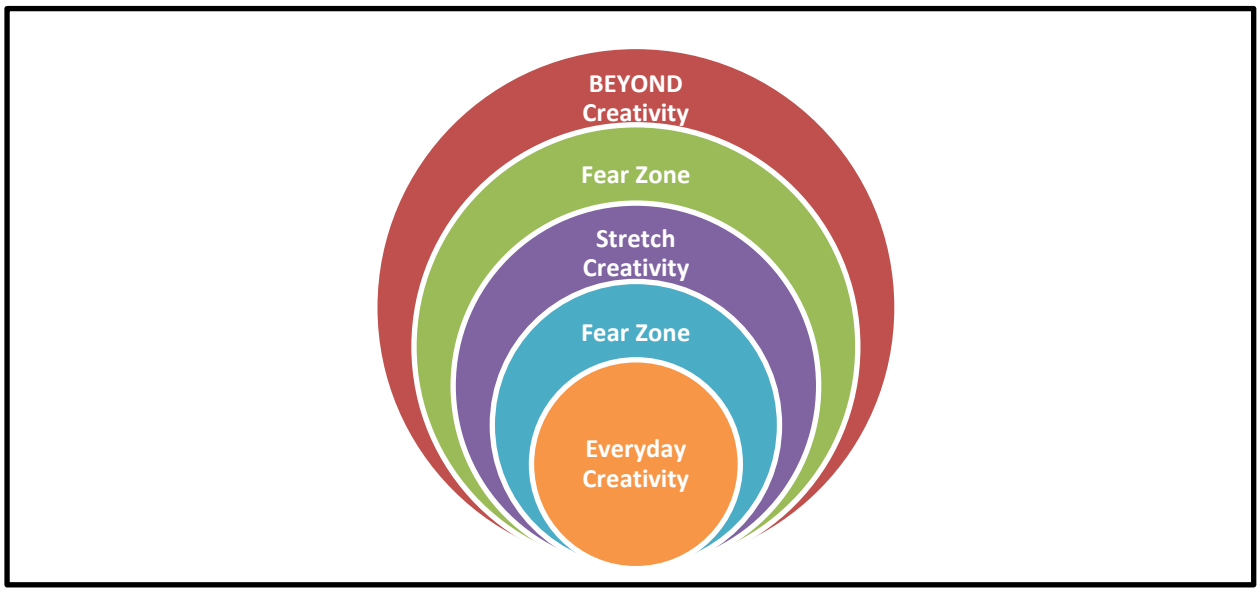
KEYS offers diverse applicability within companies. It is typically applied not just to detect the relativity that an organisation's workplace encourages creative effort, but in addition to evaluate the strength of environmental enhancement initiatives. Included in the diagnostic functionality, it will probably identify specific aspects of a work environment which might be reasonably solid or fragile operating at a given moment, supporting executives and business leadership to determine guidance for action (Amabile *et al.,* 1996:1178).

The researcher concludes that potentially the main message for a leadership team from the outcomes of the KEYS studies are that the observed workplace indeed makes a huge impact considering the degree of creativity inside the organisation. People at any job grade or level who desire to nurture creativity and innovation inside their organisations can achieve this by concentrating on what types of people are recruited; furthermore what style of individual attributes and expertise they possess, and lastly by focusing on the atmospheres and workplace ergonomics they build for the types of creative people.

4.13 NEETHLING BEYONDER CREATIVITY MODEL (2000)

Neethling's Beyonder creativity model transcends various zones of development within the creativity journey. Firstly, encountering Everyday Creativity which is adapting to the known, creativity within rules and traditions, always planned creativity, creativity without mistakes. Secondly, moving into the Stretch Creativity zone, otherwise known as the exploratory zone, which explores creativity in uncomfortable circumstances, creativity that is willing to risk, openness to outside ideas, able to shift the paradigm and challenge obsolete beliefs. Finally, accelerating into the Beyond zone, which is the ability to create new playing fields, make the impossible possible, change environments, step into the unknown in spite of violent opposition and remain passionate and excited about the other side of the wall.

Figure 4.15: Neethling Beyonder Model



Source: K.N. Group, Personal and Organisation Creativity and Innovation, (2000c)

The cornerstone of the Neethling Beyonder model is the exploration through various critical phases of exploration, discovery and self-awareness. Within each stage demanding a high level of courage to proceed and determination that transcends the mundane routine, continuously pushing the boundaries to reinvent what is possible to achieve, and thus to keep excelling and striving for the pinnacle of performance, to the extent of constantly redefining new frontiers (Neethling, 2000c:6).

The Neethling Beyonder model consists of five stages of progression, detailed as follows:

Creativity in the ordinary zone

- Adapting (adjusting) the known
- Creativity within the rules and traditions
- Always planned creativity
- Creativity without mistakes
- Creativity that is logical and rational
- Resistance to the creativity from outside
- Creativity which focuses on problem-solving

Creativity in the Exploration Zone

- Creativity that is willing to risk
- To be creative even in uncomfortable circumstances
- Creativity that takes a stand
- Creativity which is open to outside ideas
- Creativity that is willing to shift a paradigm
- Creativity which challenges obsolete beliefs
- Creativity which is not afraid to be different and original
- Creativity which speaks opportunity language
- Progressive and enterprising creativity

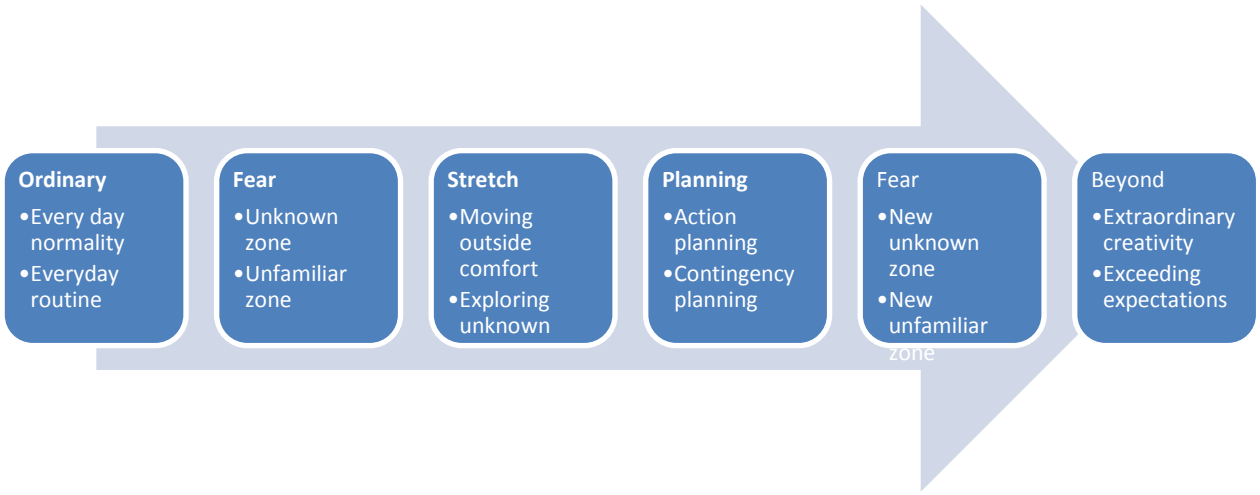
Creativity in the Beyond Zone

- To create the new playing fields
- To make the impossible possible
- To change environments (and create new ones)
- To step into the unknown in spite of violent opposition
- To keep on going in spite of uncertainty
- To completely synergise courage with creativity
- To be comfortable to be a minority of one
- To remain excited and passionate about 'the other-side of the wall'

Fear Zone

- To reflect on the circumstances and need for change
- To tackle the uncomfortable and move away from the comfort zone
- To re-invent the rules and proceed into the unknown
- To confront your fears and understand the next journey

Figure 4.16: Neethling Beyonder Creativity



Source: Neethling (2000c)

Creativity essentially implies to challenge, to generate emerging, distinctive, extraordinary and unique ideas, to interrogate outdated methods and to withstand restricted thinking and reasoning. Neethling (2011:3) challenges that in order to understand this sort of creativity demands the courageousness to devote oneself, to be able to take a firm position, to venture and to persevere.

4.14 CREATIVITY MODEL COMPARISON

This research has followed a comparative review of existing Creativity models and frameworks outlined below, to identify similarities in the various thinking and development stages, and propose a specific Creativity Model for testing the hypothesis. More importantly, it opens up the creation of a specific **Retail Creativity Framework**, that integrates performance monitoring and business enhancements, by tracking changes in human behaviour and key financial metrics to highlight the impact on business profitability.

Table 4.3 graphically presented below outlines, comparatively identifies similarities within the various phases of the creativity process. Importantly all the creativity models adopt a five phase process, with specific interventions and outcomes required at the end of each phase. Starting with some form of appreciation for the current reality it works through a systematic approach towards the discovery or birth of something new and different. Although the creativity models work towards an end or final state, dynamic approach redefines the process of ongoing rediscovery of a different creativity cycle.

Table 4.3: Creativity Comparison Diagram

Creativity Model	Date Released	STAGES / STEPS IN THE CREATIVITY PROCESS				
Wallas: Process of Creativity	1926	preparation	illumination	verification preliminary	verification final	
Rossman: Creativity	1931	observation	analysis & survey	formulation	solution analysis	birth of new idea
Osborn: Seven-Step Creative Thinking	1953	orienation	analysis	ideation	incubation & synthesis	evaluation
Koberg & Bagnall: Universal Traveler	1981	accept situation	analyse & define	ideate & select	implement	evaluate
Bandrowski: Creative Strategic Planning	1985	analysis	creativity	judgement	planning	action
Barron: Psychic Creation	1988	conception	gestation	parturation	birth of baby	bringing up baby
Fritz: Process of Creation	1991	conception & vision	current reality	adjust, learn, evaluate	build momentum	completion
Osborn & Parnes: Creative Problem Solving	1992	objective finding	fact & problem finding	idea finding	solution finding	acceptance
O'Neill and Shallcross: 5 R's	1994	person	product	process	environment	
Plsek: Directed Creativity Circle	1996	preparation	imagination	development	action	
Insel & Moos: KEYS	1996	encouragement	autonomy	resources	pressure	organisational impediments
Neethling: Beyonder Creativity Model	2000	ordinary	fear	stretch	fear	beyond

4.15 CREATIVITY INSTRUMENTS

Nieuwenhuizen and Groenewald (2006:75) summarise a number of techniques and applications which have been formulated, with different levels of accomplishment, in the evaluation of the creativeness and risk tendency of people. The researcher had done a review of the existing behavioural tools, methods and instruments that could identify creativity propensity in individuals and as a result of the evaluation of potential applications, together with the assistance of a registered psychologist, Dr. Liezel Kolf, the following instruments have been considered:

- Michael Kirton Adaption-Innovation Inventory
- Meyers-Briggs Type Indicator (MBTI)
- Torrance Tests of Creative Thinking (TTCT)
- Schein Career Orientations Inventory
- Herrmann Brain Dominance Instrument
- Neethling Brain Preference Profile (NBI)
- Neethling Beyonder Model

4.15.1 Michael Kirton's Adaption-Innovation Inventory

Adaption-Innovation (A-I) Theory draws on the specific premise that anybody can resolve difficulties and can be innovative. Adaption-Innovation (A-I) theory astutely differentiates regarding degree and form of creativity, solving problems and making decisions, which are concentrated just with style (Nieuwenhuizen & Groenewald 2006:75). Adaption-Innovation (A-I) theory reveals that individuals are not the same in their cognitive style in which they might be imaginative, resolve difficulties and construct alternatives. All these style variations are positioned on a normally distributed continuum, varying between high adaptation to high innovation. The crucial element in the classification is the fact that more transformative individuals want their specific difficulties to become affiliated with structure, and this particular structure is attained with consensus, in comparison to creative people. Creative individuals are relaxed in resolving difficulties using a reduced amount of structure, and not as distressed when structure is established by consensus, compared to far more adaptive individuals. The A-I Theory details numerous traits relating to cognitive style, such as taking risks, bigotry, tolerance of ambiguity, extroversion, conservativism and adaptability; however, omits those characteristics like nervousness, neurosis or alternatively any kind of

alternative component of cognitive effect. With Kirton Adaption-Innovation Inventory, it could possibly have been probable to evaluate a number of factors associated to creativeness and risk tendency. Unfortunately, this particular test cannot be applied due to the fact that to be able to accomplish this, you need to subscribe to the Occupational Research Centre, by undertaking training to register as a certified KAI (Kirton Adaption-Innovation) practitioner and pay a licence for the KAI test.

4.15.2 Meyers-Briggs Type Indicator (MBTI)

The MBTI instrument is based on psychological constructs, describing people in relation to interaction with each other and lifestyle generally. The MBTI employs four continua to generate a profile: extroverted to introverted, sensory to intuitive, thinking to feeling and judging to perceiving. These are produced as a result of feedback and replies can be examined and utilised to ascertain a person's location regarding each of the four continua. The grouping associated with all these locations describes the individual tested. The intuitive to thinking grouping indicates an individual's innovative and creative features. Nieuwenhuizen and Groenewald (2006:76) state that Roberts (1991) directed 73 people in a trial study, approximately two thirds of the trial were considered entrepreneurs. Analysis emphasised personality traits of extroversion (E), intuition (N), thinking (T) and perceiving (P). Even though the trial could not indicate a determinable entrepreneurial personality, alternative affiliated trials, including judging (J) and sensation (S), can be obtained for new business programs (Maritz, 2005:37). The MBTI happens to be a comprehensive test and needs to be managed by an accredited psychologist.

4.15.3 Torrance Tests of Creative Thinking (TTCT) – Paul E. Torrance

Since the start of his research at the University of Minnesota, Torrance founded and developed an experiment of creative motivation. Torrance started off by way of a very complicated hypothesis that was referred to as a test of social-personal motivation. The Torrance Tests of Creative Thinking (TTCT) had been initially printed in 1966 by Personnel Press in partnership with Ginn and Company. Shortly afterwards, Ginn closed the assessment business. The TTCT was subsequently adopted by the Scholastic Testing Service that printed Torrance's various additional creativity tests. Scholastic Testing Service developed a test-scoring program and also presently

provides test-scoring training courses in the USA, further in that the advancement, updating and solutions relating to these tests are managed by Dr John Kauffman. The TTCT offers all of the following seven skills: inventiveness, creativity, imagination, originality, flexibility, decision-making ability and courage. All the tests showcase a substantial connection amongst creativeness test scores and actual achievement. The TTCT has already been part of 2 000 studies and translated into over 32 languages. TTCT may exclusively be used by accredited Torrance experts (Torrance, 1979).

4.15.4 Schein's Career Anchors

Schein (1994:87) defines his hypothesis as follows: An individual's career anchor is considered their self-concept, composed of:

- Self-perceived skill sets and competencies
- Standard beliefs and morals
- The evolved awareness of considerations and necessities as these considerations and necessities pertain to the career.

While an individual gains work-related and lifetime experience, their occupation anchors change, and once the self-concept has formed, it will become a stabilising trigger or an anchor. Anchors are considered the beliefs and reasons which the individual will not surrender if compelled to choose an alternative. An individual's understanding of their career anchor is elevated when alternate options pertaining to self-development, family or career needs to be made. It certainly is beneficial being conscious of them so that sensible choices can be made when instances arise. The vast majority of people's self-concepts are anchored in:

- Self-direction and flexibility
- Security and stableness
- Practical and operational competency
- Essential leadership competency
- Entrepreneurial creativeness
- Serving or allegiance to a specific mission
- Genuine challenge
- Way of Living

Generally an individual's anchor is among the listed eight classifications; however, many careers in addition accommodate numerous anchors. Individuals may uncover their own real values and career anchors by using the Career Orientations Inventory. Schein's Career Anchor Test is authenticated thus no requirement for a licensed psychologist exist.

4.15.5 Herrmann's Brain Dominance Instrument (HBDI)

Herrmann adopted a four-quadrant model of thinking after a long study period and analysis about creativity and the human brain. The four quadrants represent the four thinking constructions of the brain, and the tool maps an individual's position within a specific thinking-style preference. As outlined by Herrmann, brain dominance is dependent upon cognitive preferences additionally seeks manifestation in how an individual chooses to understand, comprehend and communicate (Herrmann 1995:1). Herrmann diverged from the mental construct-based applications, such as the Meyers Briggs Type Indicator, given that he identified the necessity to find an application that measures preferences in mental functioning and associates most of these measures to specified thinking and learning style (Herrmann 1995:9. This guidance directed the creation of the HBDI (Lumsdaine & Binks, 2003:49). The HBDI provides reliable statistics pertaining to thinking patterns, preferences and potential competencies, however not a test for competencies. The HBDI splits the whole brain into four sections; every individual quadrant has a certain structure of knowing and behaviours. The sections or quadrants are identified as A, B, C and D, with A and B being the quadrants of the left brain and C and D being the quadrants of the right brain. Briefly, regarding the entrepreneurial process:

- A quadrant-dominant individual tends to be logical, analytical and rational and structure choices and actions on investigated facts (Le Roux, 2005:33).
- B quadrant-dominant individuals are looking for security, will be considerably more traditional, risk-averse and cautious (Le Roux, 2005:36).
- C quadrant-dominant individuals tend to be sociable, sentimental and religious (Le Roux, 2005:39).
- D quadrant-dominant individuals are usually more imaginative, ingenious, instinctive, exploratory and creative (Le Roux, 2005:41).

Some of the profile statistics and results gathered over several years, suggest that the preference in each one of the four quadrants is reasonably equally dispersed throughout the population, which means that the population typically signifies a composite whole brain (Hermann 1995:78). The HBDI is directed by certified HBDI practitioners, scored only by way of computer programming at Herrmann International head office in the USA at a substantial expense for use in research. The HBDI is scientifically scored and a validated measuring instrument.

4.15.6 Neethling Brain Instrument (NBI)

The Neethling brain profile theory examines the thinking preferences or cognitive style of a person. The first four-quadrant instrument originated from Ned Herrmann in 1981. Herrmann's study of Sperry's split brain research and Paul McLean's Triune Brain Model resulted in a combination theory, centered in a metaphorical model of four quadrants. Strengthening efforts of Herrmann and Torrance, Neethling recognized that both the left and right brain functions could possibly be separated into two definitive classifications, essentially splitting the brain into four quadrants. The Neethling Brain Instrument (NBI) is actually much like the HBDI and, like the HBDI, splits the brain in four quadrants (Nieuwenhuizen & Groenewald 2006:75). On the other hand, it details the quadrants differently, namely the Left 1 and Left 2 and the Right 1 and Right 2 quadrants. The NBI could possibly be considered the South African version or model of the HBDI. An individual's thinking processes may be clustered into the four quadrants in the brain, with an individual part focussing on distinctive thinking preferences, therefore a deduction of select preferences in behaviour by examining the specific area individuals prefer in their thinking. No individual thinks by using a single quadrant; to fluctuating levels most people think using their whole brain.

There may though be an inclination for behaviour to match the thinking preferences within the most intense quadrant. Generally when focussing on preference, it is essential to keep in mind, that there are not any unfavourable or incorrect profiles. The NBI is a descriptive, non-judgmental analysis; with absolutely no profile in fact more desirable or inferior than another. Rather, a person's profile provides an explanation of their very own thinking preferences and generates recommendations based on those. Entrepreneurship, as a career option, and creative thinking are part of the Right 1 brain quadrant (R1). Rational and analytical thinking along with the assessment of

alternatives and the associated risk are part of the Left 1 brain quadrant (L1). The NBI is scientifically scored and validated (Nieuwenhuizen & Groenewald, 2006:79). The Neethling Brain Instrument (NBI) need not be directed by a registered psychologist, nevertheless preferably by a registered Neethling Brain Instrument (NBI) practitioner.

4.16 CONCLUSION: THE REASON FOR CHOOSING THE KOBUS NEETHLING MODEL

After a careful study related to a number of the most suitable applications and tools, the Neethling Brain Instruments (NBI) and Neethling Beyonder Creativity Model had been recognized as the most appropriate and additionally most convenient instrument for studying and measuring deliberate creativity and its impact on the Ellerines business performance by focusing on the following:

- The Neethling Brain Instrument (NBI) need not be managed or directed through a certified professional, nevertheless preferably by a licensed Neethling Brain Instrument (NBI) expert.
- Extensive and unlimited access to all NBI instruments, tools and techniques
- Statistical rigour: extensive reliability and validity testing.
- Creative environment: physical and psychological.
- Creative outcomes: future dreams and aspirations, or lack of them, have a direct bearing on our lives. Our stance on the future may be neutral, negative or positive.
- Creative process: journey towards goals and objectives constantly interact with the environment, hence we need the correct tools, insights, attitudes and future direction.
- Creative person: your thinking, your emotions, your attitude will determine your success, not your circumstances.
- Parallels and correlational reference to evaluating business performance, cultural change and transformation.
- Ability to easily and inexpensively measure the individual, group or business unit brain preference profiler indicating specific key remedies and action.

4.17 SUMMARY

In addition to the above-mentioned reasons for choosing the Neethling creativity models, the primary motivation also includes that within the process of orchestrating the Ellerines business turn-around and consulting with various international and local business consultants, business analysts and performance experts in this regard, the researcher had come into contact with Kobus Neethling. The Neethling Group was the only creativity experts based in SA, and thus for ease of access to creativity techniques and tools, the researcher had engaged the Neethling Group to ensure a cost effective approach (consultations, creativity training, accredited creativity tools and expertise) to support the execution of the business performance enhancement in Ellerines. This partnership in SA as the first creativity business enhancement initiative has not only been cost effective, but in addition provided seamless support in the implementation of the deliberate creativity intervention in the Ellerines business.

In ensuring the achievement of the research objectives, the researcher had identified that time and access to creativity tools and techniques would play a critical role in completing this research study, and thus a further consideration in selecting the Neethling Group.