

Conceptual Framework for Designing and Developing a Creativity Enhancement Module in Education Incorporating Indigenous Perspectives

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ABSTRACT

Creativity is rated among the most important human mental attributes or human capital that is considered by researchers as the driving force behind economic development, technical advances, work-place leadership and life success. As such, creativity is certainly an important aspect of technical and vocational education and training, in which design and innovation are among the core subjects. As the perspective that enhancement of creativity can be carried out through learning and training is accepted, the design and development of instructional modules plays a significant role in enhancing the creativity levels of both trainers and trainees, especially in the field of education. Teaching and learning resources in varying degrees of depth and difficulty that cater for the individual, groups and organizations can be prepared. This article sets forth a conceptual framework for a structure for a creativity enhancement module that includes its design, development and evaluation. Key areas in the framework include theories of creativity and domains that are involved, theories of teaching and learning creativity, indigenous perspectives and theories of module design, development and evaluation of the module in the intervention process

Keywords: Creativity, enhancement of creativity, indigenous perspectives, module, theories of creativity and domains

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INTRODUCTION

Creativity is one of the human mental attributes that have been valued as a natural resource (Guilford, 1950) and a form of human capital (Runco, 1992; Rubenson & Runco, 1992, 1995). Makel and Plucker

(2008), drawing from the works of other researchers, identified creativity as the engine of economic development and the impetus behind technological advances, work-place leadership and life success. Apart from that, creativity has been used as a problem-solving approach for diverse therapies such as cultivating a healthy loving relationship as part of grief therapy. Abd. Hamid (2004) stated that in this age of globalisation, creativity is seen as a valuable asset for developing human resources.

While some believe that creativity is genetically determined and its self-expressive and spontaneous nature cannot be enhanced by training, as reported by Runco (2007) and Yong (1994), many researchers support the opposite view (Torrance, 1962; Parnes, 1962; Petty, 1997). Rubenson and Runco (1992, 1995) stated that an investment by individuals in their creative potential is in many important ways analogous to investment in formal education. In this context, importance is placed on developing the small “c” or everyday creativity of ordinary people (Petty, 1997; Craft, 2001; Richards, 2007). The recognition of this importance is supported by the inclusion of creative thinking in many national school curricula of countries such as Malaysia (Educational Planning and Research Division [EPRD], 2007; Curriculum Development Division [CDD], 2010), the United Kingdom, (National Advisory Committee on Creative

and Cultural Education [NACCCE], 1999) and Singapore (Tan & Law, 2004). In the classroom, apart from teaching creatively, importance is also placed on ‘teaching for creativity’ viz. teaching that is aimed at developing students’ creativity (NACCCE, 1999). Novice and experienced teachers alike have been placed in the forefront to enhance the creative potential of their students, for example, by modelling creativity (Belcher, 1975; Runco, 1991; Tan & Law, 2004). The school should be a unique place where teaching and the environment can be modified to develop childrens’ behaviour and non-cognitive knowledge (Othman, Amiruddin, & Hussein, 2011) as well as creative talent (Ogilvie, 1973). Pre-service and in-service teachers are trained to teach creatively and to develop students’ creativity using the formal curriculum and through their in-house training. (Rajendran, 2013; Tan & Law, 2004). Mansfield, Busse and Kreplka (1978) concluded that “creativity training programmes seem to support the view that creativity can be trained.”

De Bono (1996) introduced his CoRT Thinking Programs using lateral thinking, which involves perceptions and attention-directing tools to overcome mental blocks in thinking by generating new ideas. According to Runco (2007), “creative potentials are the most likely to be fulfilled if they are intentionally chosen and reinforced” viz. through tolerance and acceptance within society on the macro-level and the use of

strategies and problem-solving techniques in the classroom on the micro-level. The importance of this approach is supported by Amiruddin, Abd Samad and Othman (2015). On the micro level, a teaching and learning module is very helpful as it can serve as a tool, material or resource that achieves an established aim and brings effective learning to the student (Mohd Noah & Ahmad, 2005). Modules are written with fixed objectives (Mohd Noah & Ahmad, 2005) and can be used as suitable platforms to convey the explicit instructions and directions of the chosen enhancement tactics proposed by Runco (2007).

Following Craft's (2000) assertion that insights into creativity in other cultures can be overshadowed by the cultural saturation of Western concepts of creativity, Tan and Law (2004, p. 16) proposed an indigenous approach that "contributes to knowledge of creativity and highlights the study of creativity from the native perspective and for the native target group." Thus, the design and development of modules that incorporates an indigenous perspective and elements would be more relevant and inclusive of the society in study.

Modules which can be constructed for teaching, motivation, academic or for training courses Ahmad (2002), aided or unaided by facilitators (Mohd Noah & Ahmad, 2005) and designed for the individual or a class (Gibbons,

1971), can be developed in relation to creativity enhancement in education. Other considerations in the design include i) the method of teaching creative thinking viz. direct instruction method (de Bono, 1996; Lipman, 1988) versus the infusion method (Chambers, 1988; Swartz & Park, 1994); ii) needs analysis (Boydell, 1996; Ellington & Aris, 2000; Piskurich, 2006); iii) duration of course (de Bono, 2009); and iv) content level (Treffinger, 1986).

METHODOLOGY

The method adopted for the synthesis of this conceptual framework was based on a deductive approach connecting relevant theories and components from the literature review. Mohd Jamil et al. (2014, p. 4) indicated that the design and development of a framework can be carried out from content analyses of books, documents or texts.

RESULTS AND DISCUSSION

In this conceptual framework, the design and development of a creativity enhancement module in education in a research setting spanned five dimensions viz. i) the relevant theoretical background for the module content; ii) the indigenous perspective; iii) design and development of the module; iv) its role as an intervention tool/usability; and v) the output viz. the successful enhancement of creativity in the target group (Figure 1).

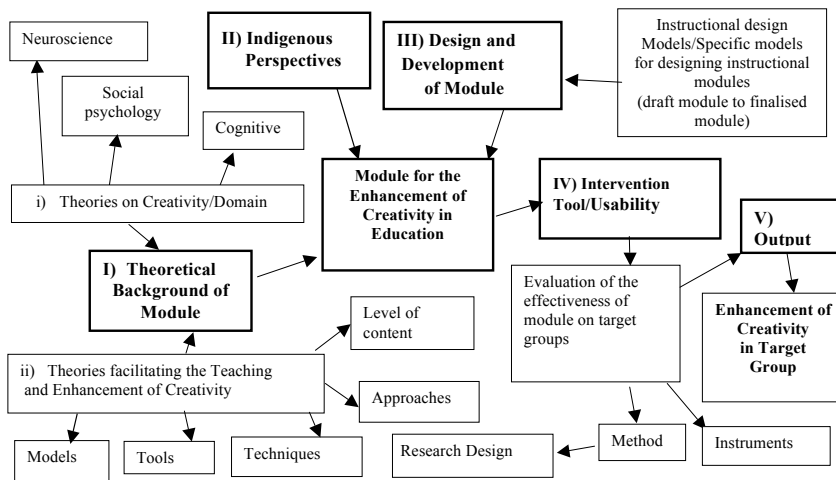


Figure 1. A framework for designing and developing a module for the enhancement of creativity in education incorporating indigenous perspectives

Components of the Framework

I) Theoretical background of module content. This dimension covers two broad types of theories relevant to the planning of the module developer: i) theories of creativity; and ii) theories facilitating the teaching and enhancement of creativity.

- i) **Theories/Models on creativity/domain.** Theories/models from different perspectives and can be taken into account to facilitate and illuminate the understanding of learning such as learning styles (Othman & Amiruddin, 2010a); this is applicable to teaching and learning involving the enhancement of creativity. In the definition of creativity itself, there have been over 100 analyses in the literature that describe it explicitly (Meusberger, 2009), among which are Rhode's (1961) 4Ps Model, Guilford's (1967) Structure of Intellect Theory (creative thinking as

an operation of divergent production) and Czikszentmihalyi's (1988) theory that creativity results from the synergy between the individual, domain and the field. Torrance (2007) followed up on Guilford's work in the cognitive field by developing and refining his psychometric instruments viz. the Torrance Tests for Creative Thinking (TTCT) featuring the subscales of fluency, originality, elaboration, abstractness of titles and resistance to premature closure. Wallas (1926) described the creative process as a four-stage process covering i) preparation; ii) incubation; iii) illumination; and iv) verification. From social psychology, Amabile (1983, 1996) proposed a componential theory that sees the interactions of four components: domain-relevant skills, creativity-relevant processes, task motivation within the individual and the social

environment itself. In neuroscience, Sperry (1964) proposed the Split-Brain Theory highlighting the dominance of the right hemisphere of the brain during holistic and creative thinking processes. Flaherty (2005) linked creativity to the activities in frontal and temporal lobes of the brain. Gardner (1983, 1999), who shifted the paradigm from the general intelligence perspective to the existence of multiple intelligences, concluded that creativity in these intelligences is subject to the individual, domain and field and is a “communal judgement.” Runco and Chand (1995) proposed a two-tier componential theory involving motivation and knowledge in the first tier, which influenced problem-solving skills, ideation and evaluation in the second tier. Simonton (1999) elaborated on creativity in the context of the evolutionary process. Kaufman and Beghetto (2009) provided an update on the ‘Big C’ and ‘Little c’ model with the four C’s model of creativity viz. ‘mini-c’ (personal transformative learning), ‘little-c’ (everyday creativity), ‘Pro-C’ (creativity in professional and vocational fields) and ‘Big C’ (eminent creativity). Sternberg and Lubart (1991) conceptualised creativity by linking it to the analogy of making an investment of “buying low and selling high” viz. developing ideas that are raw, promoting their worth and value to others and selling them before moving on to develop other new ideas. To generate creativity, the confluence

of six elements viz. i) intelligence; ii) knowledge; iii) thinking styles; iv) personality; v) motivation; and vi) the environment are needed.

According to Sternberg’s (1986) Triarchic Theory of Intelligence, intelligence covers three diverse components: analytic, practical and creative. This was further expanded to become the Theory of Successful Intelligence (Sternberg & Grigorenko, 2000), which added skills such as i) setting and achieving reasonable and relevant goals; ii) optimising strengths and minimising weaknesses; and iii) adaptation to the environment.

Domain-related theories/models can be discussed when certain specific domains are used in the enhancement of creativity. For example, the use of logo programming multimedia software to enhance students’ creativity in Taiwan (Tsuei, 1998) referenced some background theories involving the advantages of using hypermedia to help students focus on their creative ideas and integrating multimedia technology for engaging students in higher-order cognitive skills involved in design.

- ii) ***Theories facilitating the teaching and enhancement of creativity.*** To establish a theoretical base, the making of a module related to the enhancement of creativity levels of participants would require the referencing of learning theories be it general or specifically for creativity. Module developers

have the choice of using the main general learning theories (Gregory, 2016) such as from the behavioural, cognitive, social, humanistic and constructivist perspectives to underpin learning using their modules. For example, constructivism, which has become the dominant perspective of students' learning (Mayer, 2004) and is a recognised theory for modern learning (Woolfork, 1995), could be referenced. Interpreted in many forms (Phillips, 1998), it is rooted in the premise that the learner constructs "coherent and organized knowledge actively" (Mayer, 2004). In the general context, the cognitive constructivism of Piaget (1970) could apply for individualised learning, as with social constructivism (Vygotsky, 1978) for learning in groups. The module, together with the facilitator and peers in the group, forms the 'scaffolding', which helps the learner to move into the "zone of proximal development" for new learning. Gregory (2016) described the primary purpose of humanistic of learning as being student-centred and personalised and focussing on affective and cognitive needs to develop the potentials of self-actualised people in cooperative and supportive environments. Two key proponents, Rogers (1995) and Maslow (1971), identified the connection of creativity to self-actualisation.

Apart from applying generic theories of teaching and learning, there exists models and theories that are creativity-

specific. For example, Torrance and Safter (1990) proposed a three-stage creative teaching and learning model using specific strategies sequentially i.e. i) heightening anticipation; ii) deepening expectation; and iii) keeping it going. Models illuminating the stages or processes of creative thinking can help to inform and facilitate learning and teaching in that area. One of them is the four-stage model proposed by Wallas (1926) involving the stages of preparation, incubation, illumination and verification. There are many updated versions of the Creative Problem Solving Model initiated by Osborn in 1953 (Osborn, 1963) and Parnes (1962). The initial stages, which form the basis of newer approaches are: i) objective finding; ii) fact finding; iii) problem finding; iv) idea finding; v) solution finding; and vi) acceptance finding.

In developing a creativity enhancement module, other considerations can include the type of approach whether, by direct teaching or the infusion method, tools and techniques for the delivery of the lesson and the difficulty level of the content. In the direct teaching method, creative thinking is taught independently as a "stand-alone" programme or course such as those implemented by de Bono (1996), Gordon (1961), Osborn (1963), Parnes (1962) and Torrance (1962) as differentiated from the infusion method (Chambers, 1988; Swartz & Park, 1994), where teaching and learning of

thinking skills are infused with subject content.

Tools and strategies are two more important aspects of teaching and learning creative thinking. De Bono likened thinking tools to those tools such as a hammer, saw, plane and drill used by the carpenter: each performing a specific function to facilitate effectively the work to be done. Sulaiman, Aziz and Mok (2013) listed graphic organisers (including mind maps), questions and CoRT tools among thinking tools used for learning and in daily life. Buzan (2005) used the map of the city as an analogy to describe a mind map; the main theme is like the centre of the city, the main roads leading from the centre represent the main thoughts and so on. Research Trust (CoRT) tools developed by de Bono (1996) are “attention-directing perceptual tools,” represented in mnemonics e.g. PMI represents “Plus, Minus, Interesting”. “SCAMPER”, short for substitute, combine, adapt, modify, put to another use, eliminate and reverse, is another creative-thinking tool to help learners think out of the box (Osborn, 1963; Eberle, 1996).

Brainstorming is a divergent-thinking group technique introduced by Osborn in 1953 (Osborn, 1963) and developed by Parnes (1962) for creative problem solving. Rajendran (2013) highlighted that with the use of the cooperative learning structure proposed by Kagan (1989) such as ‘Think, Pair,

Share’, learners are able to assess their own thinking in comparison to other points of view and to learn from them. According to Runco (2007), brainstorming is almost definitely the most often employed enhancement technique even though it has its many distractors.

In planning the content of a module, the depth of the content needed could be facilitated by referring to models such as Treffinger’s (1986, p. 16) Three-Tier Creative Learning Model as follows:

- Level I: Learning basic thinking tools for generating and analysing ideas
- Level II: Learning and practising problem-solving models that allow students to apply basic thinking tools in a more complex and systematic structure
- Level III: Dealing with real problems and challenges that require students to use basic tools and problem-solving methods to deal with real problems.

II) Indigenous perspectives. The inclusion of indigenous perspectives of the society that the module is intended for can be used to enrich course content and make it more relevant to the targeted audience (Othman & Amiruddin, 2010b). This is applicable to the context of module making for the enhancement of creativity. According to Tan and Law (2004), the indigenous approach

or indigenisation of creativity arises from contextual considerations from social, cultural, emotional and individual systems. From a social and cultural perspective, Tan and Law (2004, p. 97) drew on connotations from the works of researchers like Kagitcibasi (1992) that the indigenous approach is a methodological orientation and Sinha (1993) that indigenisation "... takes on a character suited to the social-cultural milieu of the recipient country." As such, local elements from diverse aspects such as values, concepts, belief systems, methodologies and other resources specific to an ethnic or cultural group as described by Ho (1998), can be accepted to complement the content in the module. For example, in Malaysia, a Southeast Asian country comprising 30 million people from three main ethnic races viz. Bumiputeras, Chinese and Indians (Department of Statistics, Malaysia, 2016), Bahasa Melayu or Malay, the mother tongue of the biggest ethnic group in the country, is the national language. Malay perspectives, metaphors, poems and figure of speeches can be presented in creative exercises in the module.

III) Design and Development of the Module. Mohd Jamil, Siraj, Hussin, Mat Noh, and Sapar (2014) included the instructional module as one of the products that can utilise the design-and-development research approach. Richey and Klein (2007) posited that there are four phases in the design-and-development approach viz. the needs analysis phase, the design phase, the development stage and the evaluation

phase. Mohd Jamil et al. (2014) allocated the various methods for the different phases of constructing an instructional module: i) needs analysis: interview, Delphi or Fuzzy Delphi methods (with experts) and questionnaire feedback (from consumers); ii) design and development phase: Delphi or Fuzzy Delphi method (with experts) or content analysis of books, documents and texts; and iii) evaluation (usability tests): interview, Delphi or Fuzzy Delphi, questionnaire feedback and interpretive structural modelling (with experts), questionnaire feedback, partial least squares structural equation modelling and experimental testing involving consumers.

From an instructional design perspective, there is a wide range of established instructional design system models that can provide a source of reference or framework for the making of a specific instructional package (Ng, 2013), like a module. Piskurich (2006) considered instructional design specifically as a set of rules or procedures for creating training that does what it is supposed to do. Ng (2013) listed the ADDIE model, the Dick and Carey model and the Morrison, Ross and Kemp model as among the popular models chosen for instruction design. Ellington and Aris (2000) noted that one system that has been widely adopted has been the ADDIE model, after the acronym formed by the first letters of five stages involved in the system viz. analysis, design, development, implementation and evaluation. Branch (2009) described ADDIE as not a specific, fully elaborated model in its own right

while Molenda, Pershing and Reigeluth (1996) classified it as “an umbrella term for instructional system design models” based on oral discourse.

The Dick and Carey model (Dick & Carey, 2004) is a systems approach that uses eight iterative steps: i) identify instructional goals; ii) conduct instructional analysis; iii) analyse learners and contexts; iv) write performance objectives; v) develop assessment instruments; vi) develop instructional strategies; vii) develop and select instructional materials; and viii) design and conduct formative evaluation. The Morrison, Ross and Kemp model (2007) incorporates nine inter-dependent core elements in a circular structure, consisting of i) instructional problems; ii) learner characteristics; iii) task analysis; iv) instructional objectives; v) content sequencing vi) instructional strategies; vii) designing the message; viii) instructional delivery; and ix) evaluation of instruments.

Apart from the generic instructional design models, there are specific models for the designing of instructional modules such as those proposed by Russell (1974), Alsagoff (1981) and Mohd Noah (as cited in Mohd Noah & Ahmad, 2005, p. 27). The Sidek Model starts with goals formulation and analysis of needs, develops a synthesis of the draft module and finishes with the completed module that is ready for use. Pilot tests, validity tests and the evaluation of the effectiveness of a draft module is needed to transform the draft into a final, useable module of high quality.

An indication of a module of high quality rests upon the results of validity and reliability tests. According to Tuckman and Waheed (1981), a minimum score of 70% or 0.7 in decimal index form (Fraenkel & Wallen, 1996) of the Cronbach’s Alpha value based on responses from a feedback questionnaire among subject matter experts is sufficient to validate a module used in research. The reliability of any instrument is based on the consistency, stability, dependability and accuracy of assessment results (McMillan (2001). Brown, Irving and Keegan (2008) indicated that among methods of estimating reliability, Cronbach’s Alpha correlation, which determines the average of all inter-item correlations and adjusts them to the number of items used, is a robust statistic to be taken into account. A Cronbach’s Alpha value of 0.7 or higher would indicate enough consistency to justify making educational decisions.

In the development of any instructional package, Piskurich (2006) indicated that reviews are required for content (by subject matter experts), design, editing and organising (by experienced reviewers) and testing (with samples with nearly the same level as the audience for a beta test, and with a real audience for a pilot test before the module is ready for use).

IV) Module as an intervention tool/ Usability. According to Nielsen (1994), usability testing of a product involves testing the product on real users for input on how they use the system. In this perspective, the module as a product is used as an intervention

and its effectiveness is evaluated. Mohd Jamil et al. (2014) listed a variety of methods for usability tests involving experts and users as follows:- i) experts' review using interviews, questionnaires, the Delphi method, the Fuzzy Delphi method, interpretive structural modelling and ii) user feedback using partial least squares structural equation modelling, questionnaire and experimental tests. Abdul Wahab, Mohd Sapar and Mohd Kamaruzaman (2012) opined that the experimental design used in quantitative research using a pre-test and post-test remains the best choice to assess the effectiveness of an instructional module. Apart from that, a quasi-experimental design can also be used (Mohd Jamil et al., 2014).

Instruments for creativity assessment come from what Plucker and Renzulli (1999) considers historically, as the four Ps (Person, Product, Process and Press) categories of assessment. Makel and Plucker (2008) re-categorised them under Personality, Product, Process/Cognitive and Environmental assessments. Researchers have the choice to select relevant assessment instruments to match and test their module objectives.

Callahan and Hunsaker (as cited in Makel & Plucker, 2008, p. 258) noted that in over 40 years since Guilford's (1967) Structure of Intellect battery of tests on divergent production, assessing the creative process remains the dominant route to assessing creativity. In this category, the Torrance Tests of Creative Thinking (TTCT) developed by Torrance (1966), which has been renormed four times, has become highly recommended in the educational

field and is even used in the corporate world (Kim, 2006).

V) Output. The output will depend on the outcome for the evaluation of the effectiveness of the finalised module on the target group. A significant difference between post-test scores over the pre-test would show the effective enhancement of creativity in the target group.

DISCUSSION

This proposed framework is conceived as a general guide for module developers with the enhancement of the creativity for educational stakeholders in mind. For example, a module to enhance the creativity of head teachers or other administrators in education would take into consideration relevant theoretical background including theories of creativity, the teaching and enhancement of creativity, theories in the domain of management, indigenous perspectives, the design and development of the module, the intervention/usability of the module and the output viz. the successful enhancement of creativity in the target group. This framework can be further modified or adapted to suit the objectives of any projects in module design and development involving creativity enhancement and can facilitate the flow in which creativity modules are created.

CONCLUSION

The conceptual framework proposed in this article for the designing of a module for the enhancement of creativity in education used

in research consists of five components viz. the theoretical background for the module, indigenous perspectives, the design and development of the module, the usability of the module or its use as an intervention and finally, the output. The theoretical background is divided into two parts: i) theories of creativity/domain; and ii) theories facilitating the teaching and enhancement of creativity.

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