Thinking Skills and Creativity 19 (2016) 1–8

Contents lists available at ScienceDirect

Thinking Skills and Creativity

journal homepage: http://www.elsevier.com/locate/tsc

Facilitating creative thinking in the classroom: Investigating the effects of plants and the colour green on visual and verbal creativity

Sylvie Studente[a,*], Nina Seppala[b], Noemi Sadowska[a]

[a] Regent's University London, United Kingdom
[b] University of Lincoln, United Kingdom

ARTICLE INFO

Article history:
Received 18 November 2014
Received in revised form 23 July 2015
Accepted 8 September 2015
Available online 12 September 2015

Keywords:
Creativity
Learning
Nature

ABSTRACT

We report upon a study concerned with the effect of exposure to live plants, views to nature and the colour green upon visual and verbal creativity. The study reported in this paper was undertaken with 108 business students at a British University who were randomly allocated to one of the three conditions. The control group were placed in a classroom with no plants present and blinds drawn to block view to natural settings, the first experimental group were placed in a classroom with no plants present, blinds drawn to block views to nature but completed the creativity tasks on green paper. The second experimental group were placed in the same room as the other groups, but were surrounded by live plants and had views to nature through the large classroom windows. All participants completed two creativity tasks; a visual creativity task and a verbal creativity task. Visual creativity was assessed using a modified version of Amabile's Consensual Assessment Technique (Amabile, 1982). Verbal creative was assessed using a modified scoring method of Guilford's alternative uses task developed by Silvia et al. (2008). Findings indicate that access to natural views, plants and the colour green increase visual creativity, but have no impact on verbal creativity in classroom settings. The results suggest that creativity is domain specific and any practical measures taken to enhance creativity need to be aligned with the target domain.

1. Introduction

The research area of enhancing creativity in educational settings is an area of growing interest (i.e. Fasko, 2000; Feldhusen & Goh, 1995; Sternberg & Lubart, 1991; Hennessey & Amabile, 1987; Guilford, 1967; Pithers & Soden, 2000). Creativity research has identified a number of environmental, situational and personal factors which affect an individual's ability to be creative (i.e. Mumford, 2003; Runco, 2004; Simonton, 2003). This paper reports upon a study which examines the effects of plants and the colour green upon visual and verbal creativity. Previous research has identified that creative thinking can be enhanced by situating individuals in natural settings (Atchley, Strayer, & Atchley, 2012; Atchley et al., 2012; Shibata & Suzuki, 2002) and that exposure to the colour green can also enhance creative performance (Lichtenfeld, Elliot, Maier, & Pekrun, 2012). However, research into these areas has been sparse and to date has not been linked to the possible beneficial effects

* Corresponding author at: Faculty of Business and Management, Regent's University London, Inner Circle, Regent's Park, London NW1 4NS, England, United Kingdom.
E-mail address: Sylvie.studente@regents.ac.uk (S. Studente).

http://dx.doi.org/10.1016/j.tsc.2015.09.001
1871-1871/

to be garnered in the classroom. Others (e.g. Friedman & Forster, 2010) have looked at the impact of colour in expanding or constricting cognitive functions. We build on this research and expand it by studying the impact of exposure to nature and the colour green on creativity and, more specifically, the outcomes of creative functions.

Creativity is widely defined as a behaviour or product that is both novel and useful (Sternberg & Lubart, 1991). Studies in the area of creativity research have acknowledged that creativity is a field of research which is divided into four parts; the person, the product, press or the creative process (Rhodes, 1961; Boden, 2004; Csikzentmihalyi, 1996). This widely accepted framework denotes that creativity can be viewed from one or more of these four perspectives (Runco, 2011; Simonton, 2003). In this paper we report upon a study with a core focus on 'creative products'. In this context, creative products are understood as responses to an open-ended problem. Our focus is upon investigating conditions which are conducive or prohibitive for creative thinking in the classroom with regard to views to nature, plants and the colour green.

2. Background motivation

2.1. Towards an understanding of creativity

Although no universal definition of creativity exists due to its inherently subjective nature, a widely accepted definition is that creativity involves: "the ability to produce work that is both novel and appropriate" (Sternberg, 1998). Traditionally, creativity was viewed as a phenomena attributed to gifted individuals. A more contemporary and widely accepted perspective is that creativity is possessed by all (Weisberg, 1993). It is also understood that creativity does not exist in isolation, but rather is influenced by individual differences and environmental factors (Amabile, 1996).

The ability to be creative is often perceived as involving divergent thinking as opposed to convergent thinking, the latter concerning itself with predictable, logical cognitive operations (De Bono, 1967). It is owing to this reason that divergent thinking and the ability to view situations in a new and novel way are strongly associated with creativity. Divergent thinking is associated with producing several solutions to an open ended problem (Guildford, 1967). As well as classifications of different ways of thinking involved in creativity, differing categories of creativity have also been identified as verbal creativity and visual creativity (i.e. Dau-Gaspar, 2013; Zhu, Zhang & Qiu, 2013; Zadeh, Sook-Lei, & Dandekar, 2012). The term 'Visual Creativity' is often defined as the production of novel and useful visual forms such as; drawing, painting and photography (Dake, 1991). The term 'Visual Creativity' is often used synonymously with the term 'Figural Creativity' (Hetrick, Lilly, & Merrifield, 1968; Dziedziewicz et al., 2013). 'Verbal Creativity' is defined as the production of novel and useful responses in verbal forms such as written and spoken words (Torrance, 1962). A number of studies have been conducted to investigate the similarities and differences between visual and verbal classifications of creativity (i.e. Ulger, 2015; Petsche, 1996; Kozhevnikov et al., 2013). Whilst some scholars have reported a significant correlation between visual and verbal creativity (Ulger, 2015; Hota, 2003), others have reported that no correlation was found (Saw DeMers, 1986; Roskos-Ewoldsen, Intons-Peterson, & Anderson; Palmiero, Nakatani, Raver, Belardinelli, & vanLeeuwen, 2010).

2.2. Creativity and education

The research area of enhancing creativity in educational settings is an area of growing interest (i.e. Fasko, 2000; Feldhusen & Goh, 1995; Sternberg & Lubart, 1991; Hennessey & Amabile, 1987; Guilford, 1967; Pithers & Soden, 2000; Runco, 2008; Shaheen, 2010). Research in this area has explored a number of facets from teaching creative thinking techniques in the classroom (i.e. Torrance, 1962), developing cognitive tools for creative thinking (i.e. Wissink, 2001; Candy & Edmonds, 2000), designing learning environments conducive to creativity (Piirto, 2005; Hennessey, 2004; Waugh, 2003) to the assessment of creative thinking (i.e. Runco, 1989; Torrance, 1971). Although approaches towards creative education differ in focus, they all acknowledge that a student's creativity can be stimulated by providing assignments which involve both convergent and divergent thinking (Karnes et al., 1961; Davis & Rimm, 1985). In addition, research also suggests that providing students with insight problems within which they are required to brainstorm uses of everyday objects in unusual ways can assist with facilitating problem restructuring which in turn facilitates the creative process (Jacobs & Dominowski, 1981; Martinsen, 1995).

Creativity research has identified a number of environmental, situational and personal factors which affect an individual's ability to be creative (i.e. Mumford, 2003; Runco, 2004; Simonton, 2003). Runco & Johnson, 2002 state that in terms of education, the creative development of students is largely dependent upon the environment in which they exist. Extending upon this point we seek to investigate the effect of plants and the colour green upon creative thinking. Prior research into these areas is discussed below.

2.3. Psychological and physiological effects of plants and natural settings

There is a growing body of research exploring the effects of views to nature and the inclusion of plants and greenery on people (i.e. Shibata & Suzuki, 2004). Research in the area reports that access to the natural environment has both physical and psychological benefits (Grinde & Patil, 2009) such as; promoting health and recovery (Bell, Greene, Fisher, & Baum, 2001; Kaplan, 2001), promoting well-being in the work place (Heerwagen & Orians 1986; Shibata & Suzuki, 2001), reduction of tension and stress (Ulrich et al., 1991), and increased attention and focus (Taylor, Kuo, & Sullivan, 2001). Atchley et al. (2012)