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Thinking hats and good men: Structured techniques in a problem construction task

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ABSTRACT

Problem construction as a sub-component of problem finding is often one of the initial steps in problem solving and research has suggested that actively engaging in problem construction can lead to a more beneficial outcome and facilitate creativity. Here, we examine two techniques that may be used to help 'scaffold' problem construction ability: the six thinking hats and the six good men. These techniques can require the participant to either adopt multiple perspectives, incorporating a range of specific questions, or utilise a range of simple open ended questions. We had 100 participants take part in an on-line study that involved presenting them with a problem and requiring them to restate the problem in as many different ways as they could within a 3-min time frame. Participants were randomly allocated to groups comprising the six hats technique, the six men, or a no-intervention control group, and performance was measured in terms of the *fluency*, *quality* and *originality* of the responses. Results showed that both six hats and six men techniques produced greater fluency relative to controls, with a more robust effect for those using the six men. In terms of originality, both techniques proved beneficial relative to controls, with a more robust effect from those using the six hats. Hence, both techniques benefited performance, though in distinct ways. These results are discussed in terms of the potential benefits obtained by explicitly scaffolding thinking.

1. Introduction

The problem solving process generally proceeds across a number of phases, though not always in a linear fashion. These are the problem identification phase, followed by the idea generation phase, and finally the implementation and reflection phase (see e.g., Nickerson, 1999). A key element within the first phase of problem identification is problem finding, which includes the anticipation of problems, identifying problems where none are apparent, problem construction, and structuring an ill-defined problem so problem solving efforts can proceed (see e.g., Reiter-Palmon & Robinson, 2009; Runco & Nemiro, 1994). These problem finding processes have been shown to be a critical component of creativity (Dillon, 1982; Getzels & Smilansky, 1983) as well as an important asset in business (Fontenot, 1993) and may help individuals deal with uncertainty and adapt to the continuous changes in life (Karpova, Marcketti, & Barker, 2011). Thus, a technique that facilitates any, or all, of these problem finding processes is likely to be of significant benefit.

A common way of exploring the problem finding process is to give participants a problem statement, such as '*I am in a new city and need dinner*' (Paletz & Peng, 2009, p. 5). Participants are then asked to think of problems relating to this

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statement. While there is an element of experimenter guidance beyond what may be expected in a 'natural' problem finding situation, it is important to note that, when participants derive related problems, they are going beyond simple restatements or redefinitions. When a problem statement lacks an obvious solution, problem finding within that scenario is a generative task. Furthermore, the boundaries inherent in the statement provide the opportunity for more meaningful comparison across participant responses. Nevertheless, given that the presented problem is evident rather than discovered (cf., Dillon, 1982) our focus is on the problem construction process of problem finding.

Previous researchers have suggested that when problem construction occurs in an effortful manner, rather than simply automatically, it may result in more original and higher quality solutions (Mumford, Reiter-Palmon, & Redmond, 1994). Furthermore, engagement in problem construction, through instruction or training, may facilitate creativity, and attention to combinations of elements in a problem is likely to influence the outcome (Reiter-Palmon & Robinson, 2009). This is consistent with the view put forward by Sowden, Pringle, and Gabora (in press) suggesting that identifying more opportunities increases the probability of finding useful ideas to pursue. As such, utilising a technique that encourages the individual to think in an effortful, structured manner encourages attention to different aspects and is likely to facilitate the problem construction process. Two simple techniques that may provide such scaffolding are the Six Thinking Hats (*six hats*: de Bono, 2009) and The Six Good Men (*six men*).

The *six hats* technique helps the individual think in broader, distinct ways and includes new and/or different concepts. Each thinking hat is associated with a distinct colour and emphasises a particular style or type of thinking. For example, the white hat encourages the individual to focus on facts and information, helping them ask questions about what information exists regarding the problem and how relevant information may be obtained. By addressing the questions associated with each of the coloured hats the individual is able to thoroughly explore a wider variety of issues, facts, implications, and alternatives that should aid in the problem construction process. Furthermore, by changing hats, the individual can change viewpoints, which helps to ensure that they do not get stuck in their thinking patterns. Researchers have suggested that the technique helps to provide an explicit framework that will facilitate or scaffold creative thinking (Rizvi, Bilal, Ghaffar, & Asdaque, 2011; Schellens, Van Keer, De Wever, & Valcke, 2009). The technique itself has been praised for being easy to learn (Childs, 2012) yet there is limited empirical evidence supporting this claim, or other alleged benefits. The literature contains subjective reports of its effectiveness (see, Geissler, Edison, & Wayland, 2012) and anecdotal reports from those that have utilised the technique support its use in decision making (Benjes-Small, Berman, & Van Patten, 2014; Hodge & Ozag, 2007; Karadag, Saritas, & Erginer, 2009; Kenny, 2003). Furthermore, Schellens et al. (2009) found that students using the *six hats* to identify, or tag, their discussion contributions when using an asynchronous, on-line discussion forum showed greater evidence of critical thinking compared to those who did not. In particular those using the *six hats* showed greater evidence of 'focus' and 'novelty' in their discussion points. In contrast, Birdi (2007) found that self-reports of idea generation following training on the *six hats* failed to show any benefit. As such, beneficial claims made regarding the use of the *six hats* to improve creative thinking have yet to be clearly and empirically supported.

The *six men* technique refers to the six open ended questions: who, what, when, where, how and why. This technique stems from the six 'honest serving men' mentioned in Kipling's 'The Elephant's Child' (1902). The idea is that the individual approaches a problem with these questions in mind to help scaffold and facilitate their understanding of the issues, which in turn may improve their ability to identify more effective solutions. According to Paterson (2006) the use of such open ended questions can encourage the learner to stretch themselves and research shows that such open questions are able to elicit more diverse responses than close-ended questions (e.g., Reja, Manfreda, Hlebec, & Vehovar, 2003). More specifically, Annesley (2010) also found that these six questions can be used to help facilitate understanding. However, whilst such a technique could encourage the individual to adopt multiple perspectives when dealing with a problem, which some have argued would support problem solving (McFadzean, 1998), there is no evidence of such a technique benefiting problem construction ability.

Thus, the aim of this project was to compare the effectiveness of each technique to that of a no-intervention unstructured control group on a problem construction task. On the basis of evidence showing the facilitative effect of effortful, structured thinking (e.g., Reiter-Palmon & Robinson, 2009), we predict that participants using either the six hats or the six men technique would exhibit improved problem construction ability compared to the no-intervention control group. However, it is not clear at this stage whether any difference in problem construction ability would emerge between the two techniques.

2. Method

2.1. Participants

One hundred participants (33 male; 67 female) aged 22–70 years (mean age, 48 years) took part in an on-line study that was advertised via the internal home page of the University and via social media sites (e.g., Twitter). All participants were volunteers and completed the study for free.

2.2. Materials

The study was conducted on-line using the Qualtrics software programme to present information and record responses (Qualtrics). Five self-report questions were created using a 5-point Likert response scale. The first two assessed the