



# International Conference

## The Future of Education



### Short term intervention model for enhancing divergent thinking among school aged children

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#### Abstract

Creativity is known today as an ability that can be developed and improved. The substantial research in the field of creative studies showed that creative thinking abilities can be enhanced through intervention and training. This study presents a unique and innovative intervention program for enhancing creative thinking among children, focusing on divergent thinking skills. The program was designed as short term (ten weeks) training and conducted with 150 school students ranging in age from 9 to 13 years. The training included in a series of assignments, inspired by theoretical and practical concepts such as Mindfulness, Theory of mind and Perspective taking. The aim was to assess the effectiveness of the program, in enhancing divergent thinking skills, which were measured by fluency and uniqueness scores according to Tel Aviv Creativity Test (TACT). Results showed that children who participated in the activities scored significantly higher in the creativity tests after the intervention took place and that they showed higher creative thinking achievements compared to children in the control groups. Results indicated that creative thinking, and in particular divergent thinking abilities, can be enhanced through the kind of training that was proposed in the study.

**Keywords:** creativity; divergent thinking; television; mindfulness; theory of mind (ToM); perspective taking.

Creativity is usually perceived as something that is novel, different and innovative, yet at the same time useful, relevant, and appropriate to the task at hand (Amabile, 1983, 1988; Runco & Albert, 1990; Sternberg, 1999; Sternberg, Kaufman, & Pertz, 2002; Sternberg & Lubart, 1995). Most current researchers tend to agree that creativity potentials can be fulfilled and maximized (Craft et al., 1997; Craft, 2001; Csikszentmihalyi, 1997; Gardner, 1983; Kaufman, 2009; Nickerson, 1999; Plucker, Runco, & Hegarty, 2011; Richards, 2007; Sternberg, 2006). Moreover, it is widely accepted today that creativity can be enhanced, specifically through training (Amabile, 1996; Scott, Leritz, & Mumford, 2004a, 2004b; Stein, 1974), when most creativity training programs focus on divergent thinking (Lubart & Guignard, 2004). Based on this paradigm, the objective of this study was to carry out a short-term training program for enhancing creative thinking among school aged children and to assess its effects on divergent thinking skills.

Divergent-thinking was identified by Guilford (1967, 1968) as the ability to generate a wide variety of ideas and associations to a given problem, such ability is composed of fluency (number of responses), flexibility (different categories of ideas), elaboration (embellishment of ideas), and originality (uniqueness of ideas). Many researchers have emphasized divergent thinking as a major element of creativity (Clapham, 2011; Kaufman, 2009; Milgram & Livne, 2006; Weisberg, 2006), and the importance of it in children as an essential part of their development (Cliatt, Shaw, & Sherwood, 1980).

This study suggests a short-term training-based intervention program for enhancing creative thinking, particularly divergent thinking, among school aged children. Its objective was to establish a short term training program for enhancing creative thinking. The training program uses the child's every-day physical and virtual surroundings (reality as well as media), and invites him to become a proactive, mindful and experiential explorer of these immediate surroundings. By fully integrating this new state of mind with everyday experience, the program aims to enhance the child's creative thinking.

The research's uniqueness lies in using children's daily experiences with technology and media in order to enhance their divergent thinking. It was hypothesized that the battery of exercises suggested here would enhance creative thinking skills among children within a period of 10 weeks.

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### The Intervention Model

150 children, ages 9 to 13, were randomly divided into an experimental and a control condition. The trial was conducted among two communities in the North of Israel. The area is characterized by a diverse population of secular as well as religious inhabitants.

In order to assess children's divergent thinking abilities, all the children completed the Tel Aviv Creativity Test (TACT, Milgram & Milgram, 1976) in the classroom, before and after the intervention. The TACT consists of four sub-tests, two verbal and two figurative (e.g., what can be done with a newspaper? What are the ways in which a potato and a carrot are alike?). For each child, two scores were computed: Ideational fluency (i.e. the number of different ideas given by the subject for each item) and uniqueness (i.e. evaluating answers that were only stated by less than 5% of the subjects according to appropriateness and sophistication).

### The Program

The students in the experimental condition participated in a training program which occurred over a period of 10 weeks and consisted of 90-minute weekly sessions. Special techniques were used to develop children's creative abilities, with emphasis on divergent thinking skills.

The intervention program consists of **three stages**:

**Stage 1** offers exercises that invite the child to become a proactive and curious observer, to rediscover his or her immediate surrounding and to interact with the multiple points of view in his day-to-day experience. For example, using cameras to comprehensively investigate of a daily object; identifying specific locations in his schools by viewing extremely zoomed-in pictures; and testing their memory on their favorite animated characters.

This stage is based on the concept of mindfulness. A person in mindful state is open to various viewpoints and experiencing a continual process of reframing which skip the automatic tendency to perceive objects from only one perspective with pre-constructed mind-sets (Langer, 1989; Langer, 1997, 2000). Mindfulness enables continuous creation of new categories and openness to new information (Langer, 1989), and to actively engage in the present, noticing new things and enhance our sensitivity to context (Langer, 2000). That is why the kids were encouraged to rediscover daily objects around them and revealing as many new perspectives as possible.

**Stage 2** focuses on developing kids' ability to decipher other people's emotional state, enhancing their sensitivity to facial expression, gestures and tracking hidden nuances, helping them in guessing other people's reactions and behavior in different situations. For example, capturing emotions in a unique and surprising ways through photographs; or viewing clips from television shows, freezing them and speculating on a character's reaction.

**Stage 3** encourages the children to become initiative explorers of their physical and virtual surroundings (in reality as well as in media), and to use the skills they have acquired in the previous stages. For example, dubbing short clips from their favorite TV series, "taking a walk" in their favorite character's shoes, preparing short and original theatrical scenes, and lastly, solving an everyday problem using insights from their favorite character.

Stages 2 & 3 are influenced by the process of "Perspective Taking", an internal psychological process of adopting another's viewpoint (Grant & Berry, 2011); and by theory of mind (ToM), defined by Premack and Woodruff (1978), as the ability to comprehend mental and emotional states of others, and to use this ability in order to foresee others' behavior.

Grant and Barry (2011) found that focusing on others and adopting others' viewpoints, leads people to come up with ideas that are useful as well as novel.



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### Discussion

The findings showed a substantial and statistically significant increase in the TACT fluency indicator in the experimental condition, compared to the control group. The rise in the TACT uniqueness indicator, i.e. the children's ability to express their own individual creative ideas, was even **greater**. Thus, the findings support the study's hypothesis that the training program indeed enhanced children's divergent thinking skills.

The intervention program and its three stages encouraged the children to investigate their immediate surroundings and to become more open and attentive to new information. By inviting the children to be more curious and aware of their surroundings as well as the mental state of others, the children were able to draw from a richer battery of perspectives and perceptions when needed.

As time goes on, children have started to report on new insights and connections they have made while using the media as a source for new ideas and helpful information.

On an ending note, it's important to address the nature of the TACT creativity test. Its scoring, on the one hand, encourages "thinking outside the box", but at the same time gives crucial importance to appropriateness of the answers. Sometimes by using these parameters, some ideas are disqualified - due to lack of appropriateness despite clearly reflecting a great deal of imagination and humor. As a result, some children, who are highly imaginative but not very practical, may slip through the cracks. One of the subjects, a girl, aged 13, when asked what can be done with a shoe, offered suggestions such as "Be a teacher" (based on Hebrew idiom "as stupid as a shoe"); and to find another shoe and crown both as king and queen of their own kingdom. This demonstrates the way creativity is measured continues to be elusive and challenging.

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