THE CONSQUENCES OF INTERVENTIONS ON STUDENTS CRATIVE THINKING, FEELING, IMAGINATIONS, SCHEME IN A STEAM COURSE

Uytolsinova. S
Scientific supervisor
Rahimberdiyeva Shohzoda Sherzodovna
Student

Abstract: *One of the primary aims of STEAM education is to fit out students with the competence of creativity to solve problems. Creativity is believed to be closely related to the ability of making distant associations and combining unrelated concepts. This article explored the effects of three kinds of association mediations , remote association, close association, free association on students' constructive thinking, creative skills, empathy, and design scheme. Results marked that both remote and covered association were effective strategies in promoting creativity in the STEAM course. Whence, students in the remote association group achieved a considerably higher degree of creative thinking. While students in the close organization group significantly outperformed the remote association group on creativity ability and quality of design ideas.*

Keywords: *creative thinking, effective, empathy, associations, design ideas.*

Creativity and organization

As one of the official 21st century skills, creative thinking is central to the arts, sciences, and daily life [1, 45], and it has aroused interest unusual attention in recent times. Taking the form of originality and usefulness, creativity is the fountainhead of human civilizations, as all progress and undertaking depend on our skills to change existing thinking stencil, break with the present, and erect something new. Also claimed that people who value innovative may point to its role in most things that define our culture. Creativity is frequently associated with singularity , novelty, patent, appropriateness, imagination, feeling etc. The essence of creative thinking was claimed to be closely related to association, which is a mental process that occurs when day dream is triggered by an indirectly-related target . Correspondingly, conference intervention is a pedagogical accession adopting associations to exert influence on students' mental association activity and imagination process in a calculated way towards the expected target. Some studies focused on the ability of people with different levels of creativity to recognize remote associations and close associations[Gruszka & Necka 2002] carried out an empirical study on examining the acceptance of remote and close association, in which member were supposed to decide whether pair words given to them were either close associations or remote organization.

STEAM Education and Creativity

There is a growing student of studies that inspires the many ways in which STEAM can motivate and support students' purposeful activity, and promote their development of creative thinking [2,65]. Although creative thinking or creativity was mentioned below frequently in articles as an outcome of , there is a lack of depicting or further flaring upon the ways in which creativity is developed, practiced, or fostered through STEAM education . Few studies have shed light on the strategies related to the stimulation of creative ideas .Some works mentioned brainstorming in the context of creative idea general. Students were given a period of time for brainstorming and sharing ideas among group members to generate new concept, image and design schemes [2. 17]. However, lacking in-depth guidance, students tend to generate vulgar ideas that lack creativity. Concrete and effective creativity training structure are still commission.

Association mediation

Students in all stipulation participated in the STEAM course that included two design projects, one was to design a mask, another was to design a 3D glasses. Each design project followed four stages: aims, ideas and image proposal, Creativity inspiration, Design challenge, Presentation and evaluation, as shown in Table 2. The curriculum was evolved by the research groups with backgrounds in STEAM education with counsel from information technology teachers from the middles school. In the stage of goal nomination, it focused on invigorating students' interest in ideas and identifying the design task. By providing associated stories, videos, and pictures, teachers guided students to identify the design theme, that is, to design creative masks and 3D glasses for these two designs respectively. Students needed to understand that the goal of associations was to inductor, creative ideas blended with the real problem situation. Students' design ideas were scored on fie measures: fluency, flexibility, uniqueness, precision, and susceptibility. As shown in that compared with the control group, both remote and close association interventions have promoted the germinations of students' creative ideas. Besides, students under the close intervention condition performed best and achieved highest scores around the three groups in all fie dimension. Students also put forward some suggestions. For example, some students suggested that in the process of compulsory association, teachers could provide them with more introductions related to the association stimulus to broaden their association range. Some students said that they encountered some defiles in finding resources and hoped that more resources could be provided. Totally, the organizations interventions have a certain effect on students' creative thinking, creativity, empathy, partnership ability, and creative problem-solving ability. Although

there are still some issues, it gained overall satisfactory feedbacks and ideas from students. The present study reported that STEAM course combined with

association interventions is beneficial for gestate creativity. However, as creative thinking is among the most fad of human abilities [3.14] to further elucidate the effects of association intervention on creativity, and the differences among association interventions through which data to creative performances, more empirical studies are needed. In conclusion, the findings illustrate that students could raise the level of creativity by express training under different association strategies through the STEAM course. From one side of the coin, association intervention helps conductor the development direction of individual creativity, but it does not bounded its level. From another side, to some quite extent the mandatory association may limit students' things.

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