Using text-based worked example to enhance the creative thinking development

Ling Long Tsai

Associate Professor, Department of Cultural Creative Industries,
National Pingtung University, Taiwan

Abstract

This study focused on searching creative ideas for developing the event concepts by implementation of SCAMPER checklist. Fifty-six students were recruited to join the creative thinking workshop and eight groups were formed to design fun runs by team's choice. The researcher taught students creative thinking skills by a SCAMPER presentation; the researcher also gave each team a worked example to follow. After a group discussion, eight creative event concepts were produced. The results showed that a short training of SCAMPER technique, and providing a worked example after learning could really enhance idea generation efficiency. The worked example could guide the creators to produce practical views, and also save time on the idea development. Under the observation of the group discussion, the researcher also discovered that prior knowledge about the development issue could affect fluency of creative thinking.

Keywords: creative thinking; creativity; SCAMPER; worked example; prior knowledge

Introduction

Many people believe that creative thinking can give rise to new ideas. When encountering problems that we are dealing with, creative thinking seems the best way to discover effective solutions. According to Boden (1994), creative thinking comprises examination and translation of conceptual spaces. Uncertain experiences can activate creativity in combination with conceptual spaces. Creativity is the talent to integrate various ideas and make unusual associations among those notions, and then put them together in novel and meaningful ways. However,

the contradictory conditions we confront confuse us. Creative thinking techniques can't be applied to all conditions in one way; adjustments must be made to fit some propositions. Some researchers believe that creativity can be taught through a well-designed program. Scott, Leritz, and Mumford (2004) reviewed 70 prior researches; they found that creativity training should be modified and expanded as a specific program to enhance creative thought. Hidayat, Susilaningsih, and Kurniawan (2018) found that after the full training, students improved their ability to find the best solutions to problems. Designing a good learning process can enhance students' thinking skills and problem-solving ability.

Experts have indicated that if we inspect the same thing from different perspectives, we may obtain different solutions. The attributes of SCAMPER to scrutinise items from seven aspects, making it an ideal tool to help a team generate unique ideas. Ozyaprak (2016) advocates that trainees should be encouraged to explore and the trainers should explain the impact of steps and processes of creativity. In the training sessions, every trainee was required to generate at least three new ideas; consequently, their creative potential was tapped after the programs. Khawaldeh and Ali (2016) implemented creativity training by SCAMPER, and uncovered that the skills can effectively improve students' creativity. Utilising this technique of designing thinking programs could inspire students to reach the most of their potential according to their interests. SCAMPER is also a technique suits that group discussion.

However, it takes time to be acquainted with the SCAMPER skills. (Çelikler & Harman, 2015) spend 4 weeks and 8 working hours to complete a SCAMPER implementation. Animasahun (2014) executed SCAMPER creativity in Nigeria prisons took 6 weeks of 12 sessions intensive training. Obviously, the learners needed time to become familiar with these skills. Ozyaprak (2016) instructed one or two letters of SCAMPER per week, and endured 6 weeks to accomplish the full training. Therefore, a novice may need clear instructions on how to perform the SCAMPER technique. The worked example method has been applied to scientific subjects such as mathematics, chemistry, to direct students to solve problems by following the procedure. This research tries to use worked example as a guide to uncover if worked example could be a useful tool to lift efficiency of SCAMPER performance.

Creativity and creative thinking

Creativity is the capacity to find connections between objects. McFadzean (2000) discovered that creativity happens when new elements are brought into contact with existing ones, thereby creating a new relationship. Creativity can make people disclose things from different viewpoints. Boden (2004) proposed that creativity is the capacity to generate new, surprising, and valuable ideas or artifacts. Exploratory creativity is important because it allows people to see the probabilities they hadn't noticed before. It is reasonable to speculate that creativity not only involves finding the relationship between objects, but also the process generates potential resolutions. Creative thinking is the first step in innovating new ideas by developing process that engenders new concepts; this is the success factor behind invention. Hong (2014) found innovative ideas and solutions generated through creative thinking should be treated as a potential for creativity, not as a result of creativity. Creative thinking is the procedure of integrating conceptual categories, or mental graphics in an unprecedented way to traverse domains and overcome boundaries. This method is utilised to generate novel and proper solutions related to situations or problems (Kilgour, 2006). Creative thinking is regarded as knowledge or techniques which need to be taught. Creative thinking enables individuals or groups to see things from different perspectives (Traut-Mattausch, Kerschreiter, & Burkhardt, 2015), and can be regarded as an extension of students' learning and problem solving skills. Creative and innovative thinking is considered an essential component of education technology that sustains student learning (Navarrete, 2013).

Some researchers consider that creative thinking skills can be taught or trained by a period of intensive learning. Ulger (2016) concluded that various creative training programs can effectively enhance students' creative thinking and problem solving ability. De Jager, Muller, and Roodt (2013) claim that creative thinking skills and problem-solving techniques can be inspired by the right teaching methods. Most of the participants in their workshop believed that their creativity had made great progress. Creative workshops improve knowledge of creative thinking and problem solving. Creative thinking is not a talent but an ability that can be gained through training (Lau, 2013). These techniques must be trained until they are cultivated in our minds. The skills can then be applied to many aspects when we create a mental pattern (Awang & Ramly, 2008). The training programs are executed in schools most commonly. Fasko (2001) revealed that creativity skills can be transformed and enhanced through the practise of real work in schools. Ritter and Mostert (2017) indicate that after a short period of training, students favour to developing their creative thinking skills, which has a profound impact on their creative performance. After training, their creative performance and generation of ideas are improved by work that requires divergent thinking. Chang, Lin, Chien, and Yen (2018) state that the ability to think creatively can be enhanced through instruction; therefore, schools should design effective methods to improve creative thinking skills.

Interpersonal conversations really help to produce fresh ideas. Roberts, Headleand, and Ritsos (2017) found that creators can constitute ideas through experience and knowledge, and clarify their own ideas through contacts and dialogues with others. To articulate ideas compels us to organise our thoughts. By listening to others opinions, better directions and ideas may emerge. Under group work, the team can get the best ideas through interactions and mutual inspiration (Chan, 2013). Group thinking is one of the best way to create new products based on previous ideas; sometimes, group can innovate by incorporating others' thoughts. Team members can integrate two or more ideas to produce brand new concepts (McFadzean, 1999). In the traditional educational environment, individual creativity is inhibited by the class atmosphere. Gomez (2007) states that people have different levels of creativity, and these differences may be inherited. Usually in a typical college classroom, creativity is not encouraged. Therefore, it is suggested that instructors should establish situations to force students to find the needed information by themselves to solve problems.

SCAMPER technique

In the checklist technique is invented by Osborn (1963), he suggested that idea generation should be isolated from idea evaluation and become an independent activities. Idea checklist is a common technique used to promote creativity. Osborn used 73 questions to stimulate innovative ideas. Creativity could be generated by extending people's ideas through descriptive verbs. After a period of time, Eberle (1972) mended Osborn's 73 spurring questions and simplified it into seven categories, renamed as SCAMPER. Checklist skill can change the mindset when encountering external circumstances. Glenn (1997) confirmed that SCAMPER is a useful and interesting innovative tool that stimulates the brain to imagine novel ideas. This technique provides us with a way to overcome obstacles; students can use it as a basis for creating distinct ideas. Besemer (2000) declared that after executing this method, good ideas emerged and even changed or improved the original idea. The practice extended designers' concepts by combining and adapting different ideas; the most favourable solution can be selected from among novel ideas. Hassan (2016) described SCAMPER as the notion that could be visualised. To some extent, these spurring questions can be the facilitators to inspire different thinking abilities. They improve children's thinking and arouse their desire to explore. The technique also instructs how to break through the old patterns in a flexible way (Toraman & Altun, 2013).

Roberts et al. (2017) regard checklists as a useful instrument for creation. They consider that most creative methods begin with an idea and are then transformed or modified. One may originate an idea as a cue and expand

it into new things. SCAMPER is a superior tool that expands novel concepts. Some investigators found that SCAMPER demonstrates excellent effects on developing innovative thoughts. Ritter and Mostert (2017) employed SCAMPER to test undergraduate university students, they found that when these students were forced to change the current idea or product after creativity training, creative solutions resulted. The greatest benefit of this technique is to compel students to think in every direction of the issues, and to provide feedback to each aspect. The technique of SCAMPER is more effective compared to similar methods, with its strict and powerful skills (Seltani, Aknin, Amjad, Chrayah, & Eddine El Kadiri, 2016). SCAMPER may be regarded as a best method to fit group discussions. Hanesová (2014) utilised SCAMPER to assist students to produce fresh ideas in Content and Language Integrated Learning (CLIL) classes. This skill inspires deep thinking of complicated situations; students generated a range of useful and innovative ideas via group discussion.

Worked examples

Foster, Rawson, and Dunlosky (2018)concluded two primary learning strategies have been widely adopted by teachers, one is worked example, stating an example problem, and demonstrating the solving processes step by step. The other strategy is problem solving, starts to deal with the problem without any support. Both of them could improve student's learning. Several research indicated that, comparing to problem solving, worked examples may be more suitable for the novice, because the novice need highly guidance to solve the problems(Atkinson, Derry, Renkl, & Wortham, 2000; Renkl, 2005). When a beginner they don't have enough prior knowledge, they usually need more assistance to strengthen their problem-solving skills.

Moreno (2006) revealed that through studying examples, students used less mental efforts to construct problem-solving schemas, and increase the efficiency of searching solutions by using less study time and little cognitive resources to generate the right solutions. This worked effect appears when the learners receive related problem-solving knowledge with detailed examples at the learning stage (Rourke & Sweller, 2009). Once the problem-solving schemas are established, the learners adopt them when encountering new problems in the future(Sweller, Van Merrienboer, & Paas, 1998). McLaren and Isotani (2011) utilised Stoichiometry Tutor to analyse three statuses: examples only, alternating worked examples with tutored problem solving. They also found that learners who practised with examples only spent the least time of the three groups.

McLaren, van Gog, Ganoe, Karabinos, and Yaron (2016) tested worked examples, erroneous examples, tutored problem solving, as well as problem solving of the effectiveness and efficiency on learning, and they found worked examples needs the minimal time and exertion throughout learning procedure. Worked examples could be presented in two ways, including text and video. Renkl, Krense, Hefter, Berthold, and Riess (2015) indicated that usually the learners cannot catch up the speed of the video, therefore some important information was omitted. When using text worked example, the students could adjust their pace of reading to complete the content. Simpson, Demner-Fushman, Antani, and Thoma (2014) advocated adopting texted instruction as the presentation method could get benefits on regaining image, the attribute of discrete data, makes the learners retrieve image effectively. Hew and Cheung (2013)revealed that when discussion online, most of the students choose texted-based form, because texted interaction makes them more comfortable. Therefore, texted content is more understandable and highly effectually.

Method
Study design
The researcher used qualitative approaches to develop the event concept of the fun run. At the beginning, the participants were divided into eight teams; each team had seven people. The next step is the SCAMPER technique presentation. In this phase, the researcher focused on explaining the meaning of the SCAMPER acronym, and

how to apply the skills for creative thinking. After that, the researcher gave every team a worked example of SCAMPER (table 1) as the guidance. The students then had a group discussion in the class. During the discussion, the researcher worked as an observer to evaluate team's performance. When they got stuck in figuring out the solution, the necessary intervention was made. SCAMPER checklist forms were sent to each team for taking notes of radiant thinking. Stationary toolkits were used to aid them to write down discussion details, including keywords and bright ideas. At the same time, one team member was assigned to write down bullet points of the workshop. When they completed the event concept development, the discussion contents were transferred to a classified SCAMPER table. Finally, each one shared the event concept with their classmates.

Table 1: Worked example of SCAMPER

Acronym	Instruction of thought
S (substitute)	The route, the participant, the contents, the destination, the outlook, the materials
C (combine)	The scenery, the terrain, the incident, the dress, the people, the game
A (adapt)	The costume, the object, the time, the rule, the environment, the road
M (modify)	The pace, the regulation, the device, the distance, the procedure, the experience
P (put to other uses)	New function, new condition, new target, new purpose, new substance, new place
E (eliminate)	The accessory, the pollution, the personnel, the process, the waste, the prize
R (reverse)	The direction, the option, win or lose, the gender, the speed, the schedule

Participants

Fifty-six students who enrolled in Introduction of Leisure & Recreation in the university in the Fall semester of 2018 were participants of this study. Forty-two of them were students from the Department of Physical Education. The rest fourteen students were from other majors. Twenty of them were female (35.7 %), and thirty-six were male (64.3%).

Procedure

The researcher briefed the aim of the study and then introduced the running process of the workshop. The researcher presented the SCAMPER definition and application. There were 8 groups formed in 10 minutes, six teams majored in Physical Education, two teams were non-Physical Education. Every team had seven members, and each team assigned a leader and a note taker. A text-based worked example assists them to utilise SCAMPER to develop event concept step by step. The instructor had a SCAMPER presentation for 30 minutes, using power point slides to define every letter of SCAMPER, giving examples to explain how to execute this creative thinking method to develop new ideas. After that, the instructor provided several questions related to this technique, let the students' response these queries for 20minutes. Running this step could assure that students know all the definitions of this skills and learn well to perform it. The next step was to distribute the worked example of SCAMPER. The instructor told the students to follow the sequence of the worked example and go through it. If

some items couldn't be figured out, they could skip it and turn to the next item to create their conceptions. The next step was to discuss and develop the event concepts for 90 minutes, during the discussion, the researcher observed the interactions in the group, counted the time spent on each time, and gave the necessary support to the students who were stuck. The researcher worked as a passive watcher, and interacted with the students only when they needed assistance. Finally, each team had 5 minutes to brief their ideas generated for the running event.

The description of the workshop is as table 2.

Table 2: Description of workshop

Stage	Description	Duration
Warm up & team building	Students in the class formed their team freely, every team has 7 members.	10 minutes
SCAMPER interpretation	The instructor explains the meaning of the SCAMPER, and its application.	30 minutes
Confirm comprehension	The instructor uses questions related to SCAMPER, to confirm students understand the checklist clearly.	20 minutes
Group discussion (SCAMPER Method & Observation)	Every team finds a topic to develop event concept. The instructor hands out worked example to the students. During the group discussion, the instructor observes the whole process, and assists each team when they have questions.	90 minutes
Event concept presentation	Every team has 5 minutes to share the event concepts. Each team transferred the SCAMPER notes to a narrative statement of the event concept.	40 minutes

Data collection

The students used text-based worked example of the SCAMPER to develop the event concepts. The idea spurring checklist included: (1) Substitute, (2) Combine, (3) Adapt, (4) Modify, (5) Put to other uses, (6) Eliminate, and (7) Reverse. During the group discussion, a team member wrote down the key points of perspectives in the classified SCAMPER forms. When one SCAMPER letter was completed, they went on to the next letter.

Data analysis

After a group discussion, each team completed a filled-in SCAMPER form. Followed the context, they generated more ideas by linking the branches of thinking. The SCAMPER form helped them to check every possible direction through every single letter in the checklist. Finally, based on the SCAMPER forms, they integrated the concepts into a statement of event themes and concepts.

Results

After a group discussion, eight creative event concepts were produced: (1) forest jogging, (2) dog fun run, (3) sunset beach walk, (4) bikini fun run, (5) cartoon fun run, (6) night market walk, (7) roller skating, and (8) beer fun run. The results show that, after a short training in SCAMPER technique, students can generate novel ideas in group discussion. This procedure assisted creators to generate original ideas in developing sport event concepts. Most of the team generated thorough SCAMPER table in 60 minutes(table 3). The least spending time is 48

minutes, the longest time is 84 minutes. All of the teams went through seven SCAMPER letters and produced every facet of event concepts successfully. In order to observe the student's creative thinking development process, the researcher tried not to interfere student's group discussion. However, two teams had problems while developing the event concept by SCAMPER technique. The researcher had to answer their questions so as to help them accomplish their idea generation. In total, the researcher intervened three times during group discussion. The creative ideas were generated from the group discussion. The researcher analysed the SCAMPER form, integrated those event concepts to a narrative statement, and built the event themes and event concepts (table 4).

Table 3: The results of the workshop implementation

Team's topics	SCAMPER cycle(N)	Instructor's intervention (N)	Concept development completion time	Idea generations (N)
Forest jogging	2 and 3/7	0	51 minutes	17
Dog fun run	1and 5/7	0	59 minutes	12
Sunset beach run	2	0	57 minutes	14
Bikini fun run	2 and 2/7	0	52 minutes	16
Cartoon fun run	2 and 1/7	0	54 minutes	15
Night market walk	1 and 2/7	1	73 minutes	9
Roller skating	1 and 1/7	2	84 minutes	8
Beer fun run	2 and 4/7	0	48 minutes	18

Table 4: The brief statement of running event

Team's topics	The core concept of the event
Forest jogging	Running through the forest on the casual pace.
Dog fun run	Dogs become the protagonists of the event with friendly facilities.
Sunset beach run	Watch the beautiful sunset along the beach, and collect the coast rubbish.
Bikini fun run	Combine a beauty contest and road race, the winner is voted by the spectators.
Cartoon fun run	Participants wear cartoon outfits to compete in the game, and sold them for charity.
Night market walk	Wear slippers strolling around the market vendors, the prize is the commodities of vendors.
Roller skating	The competitors wear roller skates on the asphalt road, using air cameras as the referees.
Beer fun run	The race passes through wheat fields and beer brewery, enjoy drinking beer all the way.

Discussions

Based on the critical thinking skill development, a variety of original event design ideas were developed. Ritter and Mostert (2017) suggest that using SCAMPER techniques to develop creative ideas can compel students to think about each mentioned direction. Through such practises, they can be exposed to engagement in unexplored levels of thinking. If we aim at training students' creative thinking skills, effective creative thinking programs should be launched, and then successfully implemented to students across the board. Through creative thinking discussions, the event designers generate great ideas to ideate event programs. SCAMPER skills provide an excellent method for producing creative ideas to build robust event concepts.

Creative thinking skills are utilised to train students' comprehensive thinking abilities. Students who have the ability to synthesise and judge new situations properly will generate better solutions when encountering complex circumstances. However, acquiring some knowledge in the related fields may be necessary before creative thinking training. Benedek et al. (2014) advocates that the creative process of innovative ideas is an intrinsically directed and stated that involving semantic retrieval and integrating prior knowledge can facilitate the formation of new and creative ideas. Radziszewski (2017), also, points out that instructors should confirm that students have knowledge of a domain before operating the SCAMPER technique. In the workshop, there are two groups spending longer than seventy minutes to originate new ideas about running events. According to the dialogue with these teams, most of them do not have the experience to participate road race, even had less chance to contact the related activities, it could be a reason to hinder their imagination about running events.

In addition, familiarity with this technique can affect the results; students may not immediately learn how to implement this creative thinking technique. If teachers spend more time on training, better results could be

expected. Çelikler and Harman (2015) spent eight working hours to coach students to acquire these skills, obviously it takes time to comprehend the SCAMPER executing procedure. In the workshop, the researcher adopted SCAMPER worked example to assist students to develop event concepts. With the support of worked example, six teams completed idea generation in one hour, only two teams above one hour, but still less than one and a half hours. Therefore, worked example really enhance creative thinking efficiency, it shows that students could avoid wasting time on thinking direction.

Conclusion

The inspiration of creative thinking can be taught by teachers in class. However, what students learn is basic thinking skills. Morin, Robert, and Gabora (2018) proposed that students must deepen their understanding of creative knowledge after learning. Learning grammar and spelling in class does not guarantee that they will become writers in the future. The same thing can be found in regard to creative thinking. Knowledge of generating innovative ideas should be regarded as a tool to dig more treasure in the mind. After students have learnt the basic knowledge of creativity, they can develop deeper creative skills in the future. The more experience that learners get from the applications, the more their skills and ability increase. In this research, students with the most experience participating in the group discussion, may have better performance in developing creative concepts.

REFERENCES

Animasahun, R. (2014). Effects of Scamper Creativity Training in the Prevention of Social Problems among Selected Inmates in Nigeria Prisons. Journal of Emerging Trends in Educational Research and Policy Studies, 5(3), 301.

Atkinson, R. K., Derry, S. J., Renkl, A., & Wortham, D. (2000). Learning from Examples: Instructional Principles from the Worked Examples Research. Review of Educational Research, 70(2), 181-214. doi:10.3102/00346543070002181

Awang, H., & Ramly, I. (2008). Creative thinking skill approach through problem-based learning: Pedagogy and practice in the engineering classroom. International journal of human and social sciences, 3(1), 18-23.

Benedek, M., Jauk, E., Fink, A., Koschutnig, K., Reishofer, G., Ebner, F., & Neubauer, A. C. (2014). To create or to recall? Neural mechanisms underlying the generation of creative new ideas. NeuroImage, 88, 125-133.

Besemer, S. P. (2000). Creative product analysis to foster innovation. Design Management Journal (Former Series), 11(4), 59-64.

Boden, M. A. (1994). Agents and creativity. Communications of the ACM, 37(7), 117-121.

Boden, M. A. (2004). The creative mind: Myths and mechanisms: Routledge.

Çelikler, D., & Harman, G. (2015). The Effect of the SCAMPER Technique in Raising Awareness Regarding the Collection and Utilization of Solid Waste. Journal of Education and Practice, 6(10), 149-159.

Chan, Z. C. Y. (2013). A systematic review of creative thinking/creativity in nursing education. Nurse Education Today, 33(11), 1382-1387. doi:https://doi.org/10.1016/j.nedt.2012.09.005

Chang, Y.-S., Lin, H.-C., Chien, Y.-H., & Yen, W.-H. (2018). Effects of creative components and creative behavior on design creativity. Thinking Skills and Creativity, 29, 23-31. doi:https://doi.org/10.1016/j.tsc.2018.05.007

De Jager, C., Muller, A., & Roodt, G. (2013). Developing creative and innovative thinking and problem-solving skills in a financial services organisation. SA Journal of Human Resource Management, 11(1), 1-10.

Eberle, R. F. (1972). Developing imagination through scamper. The Journal of Creative Behavior, 6(3), 199-203.

Fasko, D. (2001). Education and creativity. Creativity Research Journal, 13(3-4), 317-327.

Foster, N. L., Rawson, K. A., & Dunlosky, J. (2018). Self-regulated learning of principle-based concepts: Do students prefer worked examples, faded examples, or problem solving? Learning and Instruction, 55, 124-138.

Glenn, R. E. (1997). SCAMPER for student creativity. The Education Digest, 62(6), 67.

Gomez, J. G. (2007). What Do We Know about Creativity? Journal of Effective Teaching, 7(1), 31-43.

Hanesová, D. (2014). Development of critical and creative thinking skills in CLIL. Journal of Language and Cultural Education, 2(2), 33-51.

Hassan, D. K. (2016). Divergent thinking techniques discrepancy and functional creativity: Comparative study of structural and procedural techniques in architectural design. Ain Shams Engineering Journal. doi:https://doi.org/10.1016/j.asej.2016.10.002

Hew, K. F., & Cheung, W. S. (2013). Audio-based versus text-based asynchronous online discussion: Two case studies. Instructional Science, 41(2), 365-380.

Hidayat, T., Susilaningsih, E., & Kurniawan, C. (2018). The effectiveness of enrichment test instruments design to measure students' creative thinking skills and problem-solving. Thinking Skills and Creativity, 29, 161-169. doi:https://doi.org/10.1016/j.tsc.2018.02.011

Hong, E. (2014). Creative thinking abilities: Measures for various domains. In Teaching and measuring cognitive readiness (pp. 201-222): Springer.

Khawaldeh, H. M., & Ali, R. M. (2016). The Effect of SCAMPER Program on Creative Thinking among Gifted and Talented Students. 2016, 30(2), 11.

Kilgour, A. M. (2006). Improving the creative process: Analysis of the effects of divergent thinking techniques and domain specific knowledge on creativity.

Lau, K. W. (2013). Creativity Training in Design Education. In E. G. Carayannis (Ed.), Encyclopedia of Creativity, Invention, Innovation and Entrepreneurship (pp. 481-487). New York, NY: Springer New York.

McFadzean, E. (1999). Encouraging creative thinking. Leadership & Organization Development Journal, 20(7), 374-383.

McFadzean, E. (2000). Techniques to enhance creative thinking. Team Performance Management: An International Journal, 6(3/4), 62-72.

McLaren, B. M., & Isotani, S. (2011). When is it best to learn with all worked examples? Paper presented at the International Conference on Artificial Intelligence in Education.

McLaren, B. M., van Gog, T., Ganoe, C., Karabinos, M., & Yaron, D. (2016). The efficiency of worked examples compared to erroneous examples, tutored problem solving, and problem solving in computer-based learning environments. Computers in Human Behavior, 55, 87-99.

Moreno, R. (2006). When worked examples don't work: Is cognitive load theory at an impasse? Learning and Instruction, 16(2), 170-181.

Morin, S., Robert, J.-M., & Gabora, L. (2018). How to train future engineers to be more creative? An educative experience. Thinking Skills and Creativity, 28, 150-166. doi:https://doi.org/10.1016/j.tsc.2018.05.003

Navarrete, C. C. (2013). Creative thinking in digital game design and development: A case study. Computers & Education, 69, 320-331.

Osborn, A. F. (1963). Applied imagination; principles and procedures of creative problem-solving: principles and procedures of creative problem-solving: Scribner.

Ozyaprak, M. (2016). The effectiveness of SCAMPER technique on creative thinking skills. Journal for the Education of Gifted Young Scientists, 4(1), 31-40.

Radziszewski, E. (2017). SCAMPER and Creative Problem Solving in Political Science: Insights from Classroom Observation. Journal of Political Science Education, 13(3), 308-316.

Renkl, A. (2005). The Worked-Out Examples Principle in Multimedia Learning. In R. Mayer (Ed.), The Cambridge Handbook of Multimedia Learning (pp. 229-246). Cambridge: Cambridge University Press.

Renkl, A., Krense, C., Hefter, M. H., Berthold, K., & Riess, W. (2015). Example-based acquisition of argumentation skills: video-based or written examples.

Ritter, S. M., & Mostert, N. (2017). Enhancement of Creative Thinking Skills Using a Cognitive-Based Creativity Training. Journal of Cognitive Enhancement, 1(3), 243-253. doi:10.1007/s41465-016-0002-3

Roberts, J. C., Headleand, C. J., & Ritsos, P. D. (2017). Creative Thinking, Creativity and Ideation. In Five Design-Sheets: Creative Design and Sketching for Computing and Visualisation (pp. 175-207). Cham: Springer International Publishing.

Rourke, A., & Sweller, J. (2009). The worked-example effect using ill-defined problems: Learning to recognise designers' styles. Learning and Instruction, 19(2), 185-199. doi:https://doi.org/10.1016/j.learninstruc.2008.03.006

Scott, G., Leritz, L. E., & Mumford, M. D. (2004). The effectiveness of creativity training: A quantitative review. Creativity Research Journal, 16(4), 361-388.

Seltani, R., Aknin, N., Amjad, S., Chrayah, M., & Eddine El Kadiri, K. (2016). A Collaborative Process of Decision Making in the Business Context based on Online Questionnaires. INTERNATIONAL JOURNAL OF ADVANCED COMPUTER SCIENCE AND APPLICATIONS, 7(7), 221-229.

Simpson, M. S., Demner-Fushman, D., Antani, S. K., & Thoma, G. R. (2014). Multimodal biomedical image

indexing and retrieval using descriptive text and global feature mapping. Information retrieval, 17(3), 229-264.

Sweller, J., Van Merrienboer, J. J., & Paas, F. G. (1998). Cognitive architecture and instructional design. Educational psychology review, 10(3), 251-296.

Toraman, S., & Altun, S. (2013). Application of the six thinking hats and scamper techniques on the 7th grade course unit "Human and environment": an exemplary case study. Mevlana International Journal of Education, 3(4), 166-185.

Traut-Mattausch, E., Kerschreiter, R., & Burkhardt, C. (2015). Creative Thinking. In M. Wastian, L. von Rosenstiel, M. A. West, & I. Braumandl (Eds.), Applied Psychology for Project Managers: A Practitioner's Guide to Successful Project Management (pp. 249-266). Berlin, Heidelberg: Springer Berlin Heidelberg.

Ulger, K. (2016). The creative training in the visual arts education. Thinking Skills and Creativity, 19, 73-87. doi:https://doi.org/10.1016/j.tsc.2015.10.007