

IMPROVING CREATIVE THINKING THROUGH GAMEPLAY

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ABSTRACT

“The fact is that everybody occasionally has a good idea, but for business, even though one good idea might take you a long way, the rate of change now really requires that people can be creative systematically, that they can depend upon their creative processes and powers. A lot of the work I do is about helping people understand how that can happen.”

Sir Kenneth Robinson, *Why Should You Care About Creativity?* - with Sir Ken Robinson - Business Podcast for Startups (mixergy.com) (Warner, 2010)

INTRODUCTION

Since the late Sir Ken Robinson expressed his views on the necessity for creative thinking the organizational world has become even more complex and the rate of change accelerated. Business education, in particular, has been criticized for its lack of critical thinking, creativity and innovation (Behrman & Levin, Snyder & Snyder, 2008; Wallace, 2022). Employers have expressed growing concern about the lack of creativity in the hiring pool of recent MBA graduates (Allen, 2020). Specific skills lacking among newly minted MBA graduates was a deficit at creatively adapting to rapidly changing technology and applying that technology to data analytics thereby making meaning. As organizations are faced with dynamic challenges and changing environments, the ability for employees to adapt, react to the environment, and apply creative solutions has become ever clearer (Boyles, 2022; Gino, 2018). Creativity drives innovation and fosters solutions to the most perplexing and urgent problems we face (McConnell & Fletcher, 2023). Creativity also triggers us to think more deeply and rationally about decisions (Gino, 2018). As the complexity of plural societies and globalization grow and emergent and generative AI technologies rapidly surface, the need to elevate our creativity thinking is paramount (OECD, 2018). The US Army is one organization that is paying particular attention to the need for creative thinking.

The purpose of this paper is twofold. First, to review the work that the US Army has conducted within the field of creativity and game play. Second, to provide guidance to educators, and organizational trainers about potential commercial analog games that can be useful to improve creative thinking in students and employees.

LITERATURE REVIEW

Creativity is generally defined as the cognitive capacity to generate novel ideas that are valuable in a particular domain, but that are not readily apparent to some people (Amabile, 1996; Csikszentmihayli, 1996). Creativity can be seen through improvisation or through structured problem solving (Moffat, Crombie & Shabalina, 2017). Scholars, however, have faced challenges in assessing creativity. There is no single test to measure creativity per se, however, there are multiple supported tests that are garnering attention. For example, Guilford’s divergent thinking test (Silvia et al, 2009), the Torrance Test of Creative Thinking (TTCT) (Neumeister & Cramon, 2004), the Conceptual Assessment Technique (CAT) (Baer & Kaufman, 2019).

The common link between the two measures is the concept of divergent thinking; “the ability to find multiple solutions to a problem” (Millar & Dahl, 2011). Divergent thinking is a form of logic that many understand as creativity. Another form of creative thinking is narrative thinking which is a companion to divergent thinking. Narrative thinking is embodied by that innate human capacity to take perspectives and understand plot twists. Examples of narrative thinking include the ability to appreciate the perspectives of team-mates or competitors which help in filling in the knowledge gaps when plans do not go as planned. This is the difference between divergent thinking (similar to Systems thinking) and narrative thinking which is more like creative story telling. Computers can replicate divergent thinking whereas humans are uniquely capable of narrative thinking (Fletcher, 2021; Fletcher & Benveniste, 2022). Divergent thinking and narrative thinking a complementary ways to approach creativity. Games that would stimulate and improve creativity could combine these approaches. Given the US Army’s operational commitments, and to reflect the changing nature of operating in a dynamic environment, we suggest that creativity should be more readily defined as “the ability to imaginatively anticipate future states and devise actions that can mitigate unexpected threats or see unanticipated opportunities.” Our wider definition encapsulates the concepts of divergent

thinking and narrative thinking expressed by the more acceptable measures of creativity highlighted above, and also suggests a more behavioral focused view.

Research into the effects of games and creativity in an organizational setting is still in its infancy. Despite there being a general indication that video game players appear to be more creative (Jackson et al, 2012), there remains limited experimental work in the area. Experimental and quasi-experiential research on the impact of gaming on general learning contexts is growing. The term “gamification” has gained consensus as a term used to describe the application of game mechanisms (virtual or analog) to non-gaming environments, often for the purpose of learning (Caponetto, Earp, & Ott, 2014). Educational gamification has been reported to impact student motivation, academic performance, commitment, and knowledge acquisition (Manzano-León, Camacho-Lazarraga, Guerrero, Guerrero-Puerta, Aguilar-Parra, Trigueros, & Alias, 2021). Board-games have been reported to improve speaking skills and foster socialization and collaborative learning (Gonzalo-Iglesia, Lozano-Monterrubio, & Prades-Tena, 2018; Hunsucker, 2016; Wong & Yunus, 2021). Gobet & Retschitzki (2004) provide a systemic study and review of the psychology of board games with attention to memory, problem solving, child development, intelligence, cognition, emotions, and motivations. The connection between games supporting the development of morals and ethical decision making has also been reported in the literature (Colby, Johnson, & Shultz Colby, 2021; Heimo, Kimppa, & Mäkilä, 2018; Schrier, 2021).

While research on gamification and learning has been growing, creativity outcomes in gamification research remain underexamined. (Moffat, Crombie & Shablina, 2017). Kumar and Raghavendran (2015) reported that Deloitte’s Maverick game, a firm-wide contest involving problem-solving teams and real-life business problems fostered employee engagement and creativity. However, there remains marginal work concerning the impact of more traditional tabletop / board games on participant creativity. This is surprising given that such games are more accessible, cost effective and can be utilized in a far greater number of environments than video or computer-based games which have various hardware and software requirements (Mercer, Harris, & Swab, 2021). For the classic strategy board games like, Risk, Stratego, Chess, or even Connect-Four and Checkers, the connection between creativity, problem solving, and winning is apparent in practice and frequently leveraged by the game-players themselves. And, yet, researchers have frequently overlooked the creative learning values of games. The interaction between creative thinking and ethical decision making in games has also been underexamined in the research.

What follows, are examples of studies that examined specific areas of endeavor applying approaches to creativity using game-like strategies in assessing the quality of plans, ethical moral philosophy formulation, and creativity through Narrative Story Science.

US ARMY CASES OF CREATIVITY THROUGH GAMEPLAY

In McConnell et al. (2018), the US Army Command and General Staff College (CGSC) conducted a mixed methods experiment to examine the effect of improving the course of action analysis step of the Military Decision-Making Process (MDMP) and the subsequent war games on a participant’s ability to assess the quality of plans. MDMP is the deliberate multi-step planning process that Army leaders employ to build detailed plans using the Operations Process of Plan, Prepare, Execute and Assess (Department of the Army, 2019). McConnell et al. (2018) found that the test group outperformed the control group in three key aspects; participants that played the wargame *Kriegspiel* prior to the wargaming step of MDMP were 1) more likely to identify exceptional information, 2) more comfortable making choices based on their visualization, and 3) more likely to change the plan based on their discoveries. Other authors have examined the impact of games on visualization during planning and execution of operations (McConnell & Gerges, 2019; McConnell, 2020; McConnell et al., 2021). These reports were consistent with and built upon McConnell et al. (2018), documenting increased levels of flexibility and originality in participants after working within the military planning step Course of Action Analysis otherwise known as the wargaming step of MDMP which is similar to a gaming environment.

In McConnell et al. (2020), the US Army CGSC and the University of Pittsburgh collaborated on a mixed methods examination of teaching ethics using games. McConnell et al. (2020) used “The Ethics Game” that was designed to encourage players to understand and apply the principles of the ethical triangle; the game required participants to think critically and creatively as they defined their personal moral philosophies and evaluated the use of the ethical triangle¹ by other participants (learning objectives of the exercise). Game play and facilitated discussion were effective at achieving learning objectives, and qualitative observers and focus groups indicated that the games were effective at engaging participants and improving information retention (McConnell et al., 2020).

¹*The Ethical Triangle is a sense making model for figuring out how people make moral choices using Principles, Virtues and consequences. James Svava H., “The Ethical Triangle,” in *Combating Corruption, Encouraging Ethics: A Practical Guide to Management Ethics* (New York: Rowman and Littlefield, 2007).

In McConnell et al. (2023) the US Army CGSC and the Ohio State University Project Narrative conducted a mixed methods study to examine the impact of narrative science on creativity (McConnell et al., 2023). In this study, the test group that received a two-hour lesson using the narrative science approach outperformed the control. One isolated 14-person group showed an almost 20% increase in creativity and the average for the test group overall was equivalent to a 14-point increase in effective IQ at solving complex open-ended problems under a time constraint. McConnell et al. (2023) supports the veracity of using a game-based approach to improve participant creative thinking. The Ohio State University Project Narrative also conducted an experiment applying narrative story science with elementary school students in Ohio (Fletcher et al., 2023). Unlike McConnell et al. (2023), Fletcher et al. (2023) considered resilience as a potential outcome of narrative story science approaches to creativity. Fletcher et al. (2023) observed improved resilience in students (not giving up when faced with adversity in a task) after they had participated in narrative story science programming. Ongoing collaborations in the field of narrative story science continue to demonstrate the value of this method in diverse contexts beyond the classroom to the practical (McConnell & Benveniste, 2024). Specifically, leaders are applying narrative story science in the US Army special-forces community and other communities have shown interest (Fletcher, Gaines, and Loney, 2023).

The impact of narrative practice on creative thinking skills in a role-playing (game) environment has also been examined (McConnell et al., 2023). In McConnell et al. (2023), a 2-hour lesson was delivered to participants using narrative story science techniques with the goal of improving creativity by observing perspective plotting and plot twisting, two behaviors that are indicators of creative thinking. Perspective plotting allowed participants to assume the perspective of a colleague and propose solutions to problems as if they were that person (e.g., role-playing). Plot twisting required participants to listen to solutions presented by others and to suggest alternate, counterfactual futures, and to also ask how that might affect the proposed solutions. Participants were given a pre and post-test at the beginning and end of the class to measure learning. After the 2-hour narrative story science lesson, the post-test was issued and then was scored by a consensual assessment technique team that evaluated on a seven point Likert scale through the variables of novelty, suitability, and feasibility; novelty was the level to which the solution was surprising, suitability was the level to which a leader might be willing to attempt this solution, and feasibility was the level to which the solution could possibly work in the real world. Feedback from students indicated that this was an optimistic and enjoyable lesson that may have built strengthened empathy by assuming other people's perspectives.

This ongoing extension of this scholarship into new contexts suggests that a game based upon what has been learned in narrative story science could be an effective platform to further extend this scholarship into new frontiers. Commercially available games may provide similar learning outcomes to those of creativity and narrative story science and may be more accessible for teachers across age groups. Several board game publishers (e.g., Genius Games, GMT Games, Catastrophe Games, Fort Circle Games, Academy Games, Tunnel Monster Collective) are creating games that are heavily thematic, providing power skills (communication, cooperation) and hard skills in natural science, mathematics, history, and civil rights. Some publishers even provide learning objectives, a glossary of terms that boost the thematic and learning experience of the game, or design-notes that connect theme to mechanics (which may also enhance learning).

KEY CONCEPTS IN BUILDING CREATIVITY

Results from McConnell et al. (2018) suggest that there are four key concepts in building creativity and a creative mindset:

1. Exceptional Information: the identification of unexpected threats and opportunities that emerge while attempting to solve problems (Wolfe, 2017).
2. Visualization: the creative skill to interpret data, as observed in the learning environment and anticipate the emergence of exceptional information in order to act first (McConnell & Gerges, 2019).
3. Empathy: the ability to express emotional intelligence that can be honed through narrative practice (McConnell et al. 2018).
4. Resilience: the ability to bounce back from adversity and create multiple iterative solutions following initial setback or failure (Fletcher, A., Enciso, P., & Benveniste, M., 2023).

In our review, we suggest three commercial games that are readily available and accessible that encompass our emerging themes above. While our list of games is by no means exhaustive, we have provided descriptions of commercially available games, referencing game characteristics that we expect will be associated with the development of creativity.

SUGGESTED GAMES:

Dixit – Creativity improved through learning how others might make choices

Dixit is a cooperative narrative style game that could easily help players take the perspectives of other players and interpret observed clues within their environment. Here, the storyteller has 6 cards in their hand that have pictures on them. They choose one card and using a sentence or word, they must describe that chosen card to the other players. Each player then selects a card that they believe best matches the story teller's description. The storyteller then shuffles their chosen card along with the other players' chosen cards and lays them out. Players (apart from the storyteller) then choose which card belongs to the storyteller. To gain points, the storyteller has got to get at least one of the players to choose their card. However, if the storyteller's description is too close to the picture and everyone selects that card, the storyteller gets zero points. If the storyteller can get only one person to choose the card and everyone else to choose some other card then they get more points. The key to success in this game is to be close enough to entice one player to select your card but not so close that everyone selects it. Dixit is a great perspective taking game because the better the storyteller knows the perspectives of the other players the more likely they will be able to figure out how to get only one person to select their card. Dixit supports narrative story science because of the heavy perspective taking aspect that was employed in the creativity experiment. For a demonstration on how to play Dixit, go to: <https://www.youtube.com/watch?v=J6UlbxeDE0w>

The Big Idea – Creativity improved through marketing to others

The Big Idea is a cooperative narrative style game that supports perspective taking. Each player has 6 cards which consist of 3 adjectives and 3 nouns. The person whose turn it is to "pitch" their idea, adjective/noun combination, displays it to the other players, and gives a sales pitch designed to elicit investments in their product. Each player receives 5 investment tokens (colored cubes) which represent money. The "pitcher" must invest at least one cube in their idea. All the other players hold up one cube and on the count of 3 they all invest at the same time. If the pitcher gets a lot of investments, then there is a dice roll to determine how many points they receive. This is a great game for supporting narrative story science because the better the pitcher knows the other players the more effectively they will be able to convince them of the value of investing in their products. For a demonstration on how to play The Bid Idea, go to: <https://www.youtube.com/watch?v=5v064vn-dx0>

Code Names – Creativity improved through learning how to give clues to others

Code Names is a cooperative word association game where spy masters attempt to get the players on their team to identify their spies but not the spies on the other team. They have to avoid selecting innocent bystanders or an assassin which ends the game immediately. The game comprises of cards that are laid out in a 5 card by 5 grid and the spy masters must give descriptors to their teammates that will help them identify as many of the spies on their team as possible. The spy masters get their teammates to select the correct card by giving them one-word clues that could identify as many cards as possible with a number of how many incidents on the board could be described by this one-word description. This is another game that employs perspective taking that supports narrative story science. The better the spymaster knows their teammates the more capable they will be of tailoring one-word descriptors that will help them identify the correct cards. For a demonstration on how to play Code Names, go to: <https://www.youtube.com/watch?v=emII43ZE9-c>

DISCUSSION AND FUTURE WORK

In all of the above examples, participants are tasked with environmental interpretation through creative imagination (encompassing visualization and exceptional information), participant perspective taking (thereby encompassing empathy), and the need to demonstrate increasingly applicable solutions (encompassing the need for resilience). For military trainers, and others, these games offer a discrete package which is easily transportable and accessible in both an office-based environment, a classroom, or an operational environment. Each game typically plays in 30 minutes thereby allowing a succinct deliverable experience. Future work should explore specific content areas (e.g. history, STEM disciplines), and commercial tabletop games that could suit the needs of specific classrooms or organizations.

LIMITATIONS FOR APPLYING GAMES TO EDUCATION, BUSINESS, AND OTHER CONTEXTS.

The main limitation to applying games outside of recreational contexts is cultural. Leaders might doubt that games might be useful in improving outcomes such as communication, operational outcomes, and shared understanding. We assert that this limitation can be addressed by a willingness to try games and assess how they improve how people interact.

Additionally, some might be intimidated by a lack of experience with games and might believe that learning how to play and then apply that experience to organizational outcomes might be problematic. Also, resistance to change is a constant challenge

to proposing something new. However, there is a driving reason to take the challenge to incorporate changes that include games.

There is plenty of evidence in the body of knowledge that games have incredible untapped potential for improving organizations and what they do (cited above). Considering this evidence, why would leaders not try such a low cost and fun approach to learning, communicating, and sharing perspectives?

CONCLUSION

Although existing commercial games may be useful for increasing creativity, outcomes of this examination of improving creativity through gaming could provide a foundation to build a game based completely upon the creativity study. Such a game could employ the narrative story science techniques that caused a 14-point jump in effective IQ at solving complex problems under a time constraint. Such a game would be applicable in multiple contexts beyond the military. If organizational leaders could purchase a game that would cause them to increase the creativity and resilient adaptation of their teammates, why would they not do it? The authors recommend the adoption of evidence-based narrative story science techniques in the creation of future creative games as a way to boost creativity in their organization through an experiential learning approach that is also fun.

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