

THE BOARD GAME PROJECT: AN EXPERIENTIAL LEARNING EXERCISE TO DEVELOP CONCEPTUAL, FUNCTIONAL, AND VISUAL CREATIVITY SKILLS

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ABSTRACT

Creativity is one of the most in-demand skills sought by employers, as organizations must continue to innovate to keep up with technological advancements and remain competitive in a globalized economy. This paper outlines a board game project that instructors can use to develop students' conceptual, functional, and visual creativity skills. The results provide each student with a meaningful experiential exercise working with a team that invents a board game and develops it all the way to a manufactured product. The step-by-step process is provided along with an instrument to measure the creative performance of the completed board games. Following the board game project, students write an experiential learning essay summarizing their concrete experiences, reflective observations, abstract conceptualizations, and plans for active experimentation according to Kolb's (1984) Experiential Learning Model.

INTRODUCTION

Organizations must innovate to remain competitive, which means they must hire and develop creative employees. The World Economic Forum's *Future of Jobs Report* (2020) states that creativity is among the top-10 most in-demand skills across all jobs through 2025. Likewise, according to some recent LinkedIn surveys, creativity is among the most desirable skills sought by employers (Petroni, 2019; Anderson, 2020). Furthermore, Nixon (2021) contends that creativity is the one soft skill that has a return on investment for businesses. To help meet the needs of employers and prepare students for their careers, this paper introduces a board game project that develops students' creativity skills before graduating and entering the job market.

A game is defined as organized play (Klopfer, Osterweil, & Salen, 2009), where play is both voluntary and intrinsically motivating. Suits (1978) describes games as unnecessary obstacles we voluntarily tackle. Games are universal and timeless and transcend many demographic factors such as age, race, gender, education, and income. Everyone can think of at least one game they like to play, and many people enjoy all types of games. A board game is played on a hard surface or table and contains other components such as pawns, cards, dice, and timers, to name a few. They vary widely in genre, theme, number of players, objectives, and playing strategies.

The board game project challenges students to be creative in three ways: *conceptually*, *functionally*, and *visually*. *Conceptual creativity* requires novelty and relevance. It aims to solve problems by integrating current knowledge with new ideas. *Functional creativity* requires

usefulness and performance. It aims to ensure that every part of the invention serves a purpose and works with all the other parts. *Visual creativity* requires pleasing perceptions and the senses. It involves artistic design and aims to ensure that the invention is aesthetically attractive and appropriately communicates the concept. These forms of creativity overlap throughout the board game creation process. For example, the board itself must be *visually* compelling, emulate the *concept* of the game, and provide a *functional* purpose.

EVALUATING BOARD GAMES AND CREATIVE PERFORMANCE

Board games can quickly be evaluated by players, which provides a link between the creative person(s) and creative performance. Instructors should provide students with board game evaluation criteria before the board game creation process to help guide their ideas, decisions, and efforts. The criteria are derived from the gaming industry literature (Shute & Ke, 2012) and the engineering design literature (Oman, Tumer, Wood, & Seepersad, 2013). Appendix A: Board Game Evaluation Sheet provides the evaluation instrument with the ten criteria. The structure of this instrument is adapted from an assessment called the Multi-Point Creativity Assessment (Oman et al., 2013), which is utilized in engineering design to provide a quick but detailed judging method. It is based on a proven task analysis method developed by NASA (Hart & Staveland, 1988) and on adjective pairing employed by the Creative Product Semantic Scale (Besemer, 1998), which allows non-experts in any field to evaluate a new product by expressing their opinions about their experience with the product.

Each criterion on the Board Game Evaluation Sheet contains two adjectives on opposite ends of a 21-point scale. This allows instructors to assign various standards and rigor to the project. For example, a more general and less rigorous standard requires that most evaluations for each criterion fall on the right side of the midpoint mark. Or an instructor can assign a more specific goal by requiring that each evaluation meet a certain number on the scale (12+), and the higher the number, the more rigorous the standard. The mean scores on all criteria can then be added together to determine an overall score for the board game. The scores on specific criteria can also be linked to the three types of creativity student teams must demonstrate during the board game creation process – *conceptual*, *functional*, and *visual*. More information on this is provided in the next section, which outlines the implementation steps for the board game project.

BOARD GAME PROJECT IMPLEMENTATION STEPS

Instructors can implement the board game project in a traditional 16-week college course on creativity, innovation, entrepreneurship, or any other class requiring students to be creative. It can also be used in marketing courses to allow students to apply different steps of the New Product Development (NPD) process (Cooper, 1994; Crawford, 1991). It could even be used in a capstone design project course to help teams with creativity and collaboration. The entire project takes 13 weeks to complete. The nine steps for implementation are provided below, along with the number of weeks needed to complete each step.

Step 1: Self-Assessments, Team Formation, and Project Overview – Week 1

The Kaufman Domains of Creativity Scale (Kaufman, 2012) is a 50-item self-report assessment that measures creativity in five domains: self/every day, scholarly, performance, mechanical/scientific, and artistic. Since the board game project requires students to be creative *conceptually* (self/every day, scholarly), *functionally* (performance, mechanical/scientific), and *visually* (artistic), the K-DOCS survey is instrumental in forming balanced teams. Teams of four to five students are ideal, however teams can range from three to six members.

After teams are formed, discuss the three types of creativity the board game project requires them to demonstrate – *conceptual*, *functional*, and *visual*. Provide teams with an overview of the board game project, steps for completion, deadlines, evaluation criteria, and limitations. For limitations, some suggestions for class and university purposes are to have students keep it PG-13 and provide each team with a budget. For the suggested manufacturer (boardgamesmaker.com), \$75 is a reasonable budget. Another limitation for student teams is to keep their creations within the boundaries of what the manufacturer can produce. It is helpful to have the students peruse their website before the next step. For evaluation purposes, the game should allow for at least four players and the players should be able to finish it within a reasonable period, such as 30-90 minutes.

Step 2: Board Game Concept Generation – Week 2

The first thing each student team should do is generate the overall concept for the board game. This requires *conceptual* creativity. Teams need to determine several things during this step:

- Describe the objective(s) of the board game. In Monopoly, for example, the objectives are to own as much property as possible and be the wealthiest person.
- Determine the type of game being created. Several options include, but are not limited to, strategy, adventure, role-playing, fantasy, conversational, or educational.
- Identify one or more themes of the game. A theme may include specific characters, it could be futuristic or historical, or the game can be based on some aspect of social culture like sports or music.
- Like any invention, describe the audience or target market. Some games are for adults, while others are for children. The target market might also include people with specific interests, lifestyles, hobbies, or knowledge.
- Generate a name for the board game that represents the objective, type of game, theme(s), and intended audience.

The board game evaluation criterion to focus on in step 2 is *game concept* by making it as original as possible.

Step 3: Board Game Strategy Creation – Week 3

During this step, student teams must determine the game's rules, clearly identify how a player wins, and develop different strategies players can use to win the game. Like step 2, this step requires *conceptual* creativity. The rules must be complete, focused, and easy to understand. Some specific things to address are the minimum and maximum number of players, which player starts and how that is determined, what is allowed and not allowed during a player's turn, and how to address any special circumstances that may occur. It is best if student teams determine multiple ways a player can win because this makes the outcome more suspenseful. It is crucial to think through how different situations will be resolved, such as how a tie will be settled. Player control via different actions and decisions should be built into the game because it enhances the playing experience, and players feel like they can influence the game's outcome.

As the game's strategic elements are created, several criteria on the board game evaluation sheet to consider are playing experience, gameplay, rules, game outcome, player control, player challenges, and performance feedback. They all require *conceptual* creativity.

Step 4: Development of Board Game Mechanics – Week 4

In this step, student teams determine the tangible components needed to play their game, which requires *functional* creativity. The tangible features include the box size, the board's layout, and all the pieces. While all board games must have a box and board, the other pieces vary from game to game. There may be cards, dice, pawns, play money, spinners, timers, tokens, or other components. It is essential that each piece have a purpose and that all the pieces work together. The board game mechanics determine the details of how players interact with each other and interact with the game itself. For example, in Monopoly, the mechanics are centered on dice rolling, buying/selling property, and exchanging money with the bank and other players. Student teams should check the prices of each component on the manufacturer's website, considering the needed quantity of each piece, to ensure they are within their budget.

As student teams develop the tangible components of the game, the two main board game evaluation criteria to consider are game features and gameplay. However, other criteria that can be enhanced through game mechanics include playing experience, player control, player challenges, and performance feedback.

Step 5: Prototype Design of Board Games – Week 5

Before student teams create the artistic designs of their board games, it is essential to develop a functional prototype that objective outsiders can play to provide feedback on board game concept, strategy, and mechanics (steps 2-4). Posterboards work well for drawing out the game board. Rules can be provided on a typewritten 8.5x11 sheet of paper. If the final game includes custom cards, handwritten index cards work well for the prototype. In many cases, entire decks of cards do not need to be generated for the prototype, but enough cards should be created to give players a good idea of how they are used and impact gameplay. Specific game

components such as dice, pawns, spinners, play money, and tokens can typically be borrowed from other board games to turn the prototype into a functional game.

Step 6: Prototype Evaluation of Board Games – Week 6

Student teams should have two or three groups of people in the intended audience play their prototyped game. These players should not be involved in the creation of the game. Have each player complete a Board Game Evaluation Sheet on all criteria except game design.

Step 7: Final Board Game Revision and Design – Weeks 7 through 9

After considering the feedback from all players who played the prototypes, the games should be revised. A few items of feedback student teams often receive are that the rules are unclear or incomplete and that their games need to be more interactive (evaluation criterion - gameplay) or suspenseful (evaluation criterion - outcome). This requires them to go back to step 3 on strategy creation and think of ways to improve player control, make it more interactive, and ensure player challenges are more adaptive.

During this step, student teams also begin designing the game, which requires *visual* creativity. It must be visually appealing to its target audience and emulate the game's concept. As logos, pictures, and other artwork are designed by the teams, it is critical for them not to infringe on any intellectual property. Most of the artistic design work appears on the box, board, and cards if included.

Step 8: Order Board Games from Manufacturer – Weeks 10 – 12

While several board game manufacturers exist, Board Games Maker (boardgamesmaker.com) is suggested for several reasons. They have over 35 years of experience manufacturing high-quality custom board games and all their components. There is no minimum order on most items, so you can order just one copy of each board game. Everything can be done on their website, from ordering standard dice to submitting custom designs for the box, board, pawns, and cards. There is no setup fee for the artwork. Costs of all game components are relatively inexpensive. And manufacturing and shipping combined only take a few weeks.

Step 9: Evaluation of Manufactured Board Games – Week 13

Once the final board games arrive, allow each student team to be the first to play their game. Appendix B: Results of Manufactured Board Games shows student teams playing their manufactured board games. Then have three to five groups of people in the intended audience play and evaluate them using the Board Game Evaluation Sheet. Try to get at least 20 individuals to play and evaluate each game. Instructors can use the results of the board game evaluations to assign grades to the student projects.

ASSESSING EXPERIENTIAL LEARNING

The Board Game Project is an experiential exercise, meaning the students actively engage in the learning process. Kolb's Experiential Learning Theory (1984) defines learning as the process whereby knowledge is created through the transformation of experience. Kolb's model includes four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. After students play their completed games and receive feedback from the evaluations, each student should write an experiential learning essay that includes the four parts of Kolb's model:

- Concrete Experience – describe the process of, results of, and your contributions to the board game project.
- Reflective Observation – discuss one or two things that were most meaningful to you from your experience developing the board game.
- Abstract Conceptualization – identify any new knowledge you gained by being involved in creating your board game or how it altered what you thought you knew before the project to what you now know.
- Active Experimentation – describe how you can take what you learned from your board game creation experience and use it to invent another product, start a business, make improvements in your current job, make future career plans, improve learning in other classes, and/or apply it to other aspects of your life.

An example of a student essay is provided in Appendix C: Sample Board Game Project Experiential Learning Report.

DISCUSSION

The board game project provides instructors with a meaningful, semester-long project that challenges student teams to be *conceptually*, *functionally*, and *visually* creative. Each team's board game is easy to evaluate by individuals who play the finished games and score them according to ten criteria that link back to the three types of creativity.

This project also supports Level 6 of Bloom's Taxonomy of Cognitive Learning, which is Creating (Bloom, 1956; Anderson, 1999). Creating is the highest level of student learning. It involves producing new or original work, and it requires students to generate, plan, and produce something to form a coherent and functional whole.

Moreover, the Board Game Project provides students with a legitimate experience that helps them answer job interview questions about creativity skills, which employers highly seek (Petroni, 2019; Anderson, 2020; World Economic Forum, 2020; Nixon, 2021). Some questions employers may ask are:

- Can you tell me about a time when you demonstrated creative thinking at work or school?
- What is the most creative or innovative project you have ever worked on?
- When have you had to think outside the box to create something new or solve a problem?
- Have you ever had to work on a team to develop something innovative?

The board game project gives students great answers to these common interview questions. They can discuss the final board game results, the process their team used during the project, their individual contributions to the final product, and what they learned from it.

It also provides students with a semester-long collaborative experience that translates well into many workplaces that rely on collaborative skills. Research shows that employees who work collectively on a task demonstrate higher engagement levels, lower fatigue levels, and a higher success rate (Priyanka & Walton, 2014).

One suggestion for further development of this project is to conduct a pre and post-creative self-efficacy survey (Karwowski & Lebuda, 2016; Tierney & Farmer, 2002) or a creative personal identity survey (Karwowski, Lebuda, Wisniewska, & Gralowski, 2013) to determine if students' beliefs about their creative potential (CSE) or self-image (CPI) increases by participating in the project. The experiential learning reports provide strong evidence that this is occurring.

In conclusion, the board game project helps meet the needs of employers who are seeking employees with creative skills that can be further developed, it prepares students for their careers by giving them a meaningful team project that requires *conceptual*, *functional*, and *visual* creativity, and it provides instructors with a fun project that meets many universities' experiential learning requirements.

REFERENCES

- Anderson, L. W. (1999). *Rethinking Bloom's Taxonomy: Implications for Testing and Assessment*.
- Anderson, B. M. (2020). The most in-demand hard and soft skills of 2020, *LinkedIn Talent Blog*, Retrieved from <https://www.linkedin.com/business/talent/blog/talent-strategy/linkedin-most-in-demand-hard-and-softskills>.
- Besemer, S. (1998). Creative product analysis matrix: testing the model structure and a comparison among products - three novel chairs. *Creative Research Journal*, 11(3), 333–346.
- Bloom, B.S., Engelhart, M.D., Fürst, E.J., Hiss, W.H., & Krathwohl, D.R. (Eds.) (1956). *Taxonomy of educational objectives. The classification of educational goals*. Handbook I: Cognitive Domain. New York: Longmans
- Cooper, R. (1994) Third-generation new product processes. *Journal of Product Innovation Management* 11, 3-14.
- Crawford, C. (1991) *New Products Management* (3rd ed). Irwin, Homewood, IL.
- Hart, S. G. and Staveland, L. E. (1988). Development of NASA-TLX (Task Load Index): Results of empirical and theoretical research". In *Human Mental Workload*, Edited by: Hancock, P. A. and Meshkati, N. 139–183. North-Holland, the Netherlands: Elsevier Science Publishers B. V.
- Karwowski, M., & Lebuda, I. (2016). The big five, the huge two, and creative self-beliefs: A meta - analysis. *Psychology of Aesthetics, Creativity, and the Arts*, 10(2), 214.
- Karwowski, M., Lebuda, I., Wisniewska, E., & Gralowski, J. (2013). Big five personality traits as the predictors of creative self-efficacy and creative personal identity: Does gender matter? *The Journal of Creative Behavior*, 47(3), 215-232.
- Kaufman, J. C. (2012). Counting the muses: Development of the Kaufman Domains of Creativity Scale (K-DOCS). *Psychology of Aesthetics, Creativity, and the Arts*, 6(4) 298–308.
- Klopfer, E., Osterweil, S., & Salen, K. (2009). Moving learning games forward. *Cambridge, MA: The Education Arcade*.
- Kolb, D. (1984). *Experiential Learning: Turning Experience into Learning*. New Jersey: Prentice-Hall.
- Nixon, N. (2020). *The Creativity Leap: Unleash Curiosity, Improvisation, and Intuition at Work*. Berrett-Koehler Publishers Inc.
- Oman, S. K., Tumer, I. Y, Wood, K., and Seepersad, C. (2013). A comparison of creativity and innovation metrics and sample validation through in-class design projects. *Research and Engineering Design*, 24, 69-92.

- Petrone, P. (2019). The most in-demand hard and soft skills of 2020, *LinkedIn Talent Blog*, Retrieved from <https://www.linkedin.com/business/talent/blog/talent-strategy/linkedin-most-in-demand-hard-and-softskills>.
- Priyanka, B. C. & Walton, G. M. (2014). Cues of working together fuel intrinsic motivation, *Journal of Experimental Social Psychology*, 53, 169-184.
- Shute, V. J., & Ke, F. (2012). Games, learning, and assessment. In *Assessment in Game-Based Learning* (pp. 43-58). Springer, New York, NY.
- Suits, B. (1978). *The Grasshopper: Games, Life and Utopia*. Broadview Press
- Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45(6), 1137-1148.
- World Economic Forum. (2020), *The Future of Jobs Report 2020*. Retrieved from <https://www.weforum.org/reports/the-future-of-jobs-report-2020/>.

APPENDIX A: BOARD GAME EVALUATION SHEET

BOARD GAME EVALUATION SHEET

Instructions:


- 1) Play the board game
- 2) Evaluate it on the ten criteria provided below:
 - **Game concept** – the overall idea should be original. It should not seem like a copy or version of another board game already on the market.
 - **Playing experience** – the player’s experience during the game should be surprisingly fun rather than dull or expected.
 - **Game features** – the game’s components, such as the board and other parts, should be unique rather than ordinary.
 - **Game design** – the design of the box, board, and all components should, at a minimum, be attractive and intriguing. The goal is for the design to be more astonishing than boring.
 - **Gameplay** – it should be interactive, where players consistently interact with the game itself and/or each other. Gameplay usually involves solving problems or engaging in quests.
 - **Game rules** – the objective and rules of the game must be clear and help players focus on what to do and when.
 - **Game outcome** – the game should be suspenseful and never predictable at any point during the game.
 - **Player control** – the game should allow for player influence through their decisions and actions.
 - **Player challenges** – the game should balance difficulty levels to match players’ abilities.
 - **Performance feedback** – the game should provide ongoing feedback to players about how they are performing throughout the game.

Name of Board Game _____

After playing the board game, please evaluate it on the ten criteria by placing an X on the continuum between the two descriptors. **Please place your X on a line and not inside a box.**

Game Concept: Unoriginal Original


Playing Experience: Expected Surprising


Game Features: Ordinary Unique


Game Design: Boring Astonishing


Gameplay: Static Interactive


Game Rules: Vague Focused


Game Outcome: Predictable Suspenseful


Player Control: Ineffectual Influential


Player Challenges: Non-adaptive Adaptive to Ability


Performance Feedback: Infrequent Ongoing


Please provide any constructive feedback below:

**APPENDIX B:
RESULTS OF MANUFACTURED BOARD GAMES**





**APPENDIX C:
SAMPLE BOARD GAME PROJECT EXPERIENTIAL LEARNING REPORT**

Concrete Experience:

The idea for our board game was from a home renovation app. The game contained different components you would see if you were renovating a home, including furniture, appliances, cabinetry, and good and bad things you could run into during a renovation. My main contributions were defining the rules, deciding on all the game components needed, and designing the playing cards. I came up with the idea of having different decks since there are many areas when renovating a home.

Reflective Observation:

The most interesting aspect of the project was how to relate all the components of the board game to one another. The hardest part was deciding on how to play the game because my team and I all had so many different creative ideas. Something specific about the finished board game product that surprised me was how good our final board game looked. I thought our game was nicely put together and was not missing anything. I also enjoyed being able to step out of my comfort zone and work with students I did not know.

Abstract Conceptualization:

Before creating a board game from start to finish, I thought it would be easy, but I soon realized it is a complicated process. Coming up with a new idea for a board game was challenging. Our concept was innovative, and I was happy to be a part of my team because we worked well together to create a board game with all the necessary components. I learned that with a group of talented individuals you can accomplish anything. After we saw our finished board game and played it with each other, I wondered how easy it would be to sell what we created. I looked on Amazon and found that anyone can build a store for free.

Active Experimentation:

This project taught me many valuable things that will be useful in the future when I open my own floral shop. It is amazing what a team can accomplish when you combine ideas and talents. One thing I will take from this project is to always consider how to make different components of a product flow together. Another thing I will do is be creative when coming up with rules and regulations for my employees because creative ideas help make the workplace better.