

THE APPLICATION OF RESPONSIBILITY EDUCATION ON SUSTAINABILITY ISSUES

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ABSTRACT

People start to rethink if to sacrifice the ecology for the prosperity of the various industries for a better life. Responding to the United Nations 2030 Sustainable Development Goal SDGs 4 "Quality Education," in addition to equal education for everyone, its deeper meaning can emphasize the "value-added" of education. Some enterprises and schools in Taiwan are committed to sustainable education, but sustainability issues are often difficult to be understood because of too many terms. Therefore, we divide the topic of sustainable education through game-based learning was conducted that includes three types: Sustainability puzzle, Sustainability and reaction and Sustainability strategy board games. We wish to attract more people to participate in sustainability issues and get a better life.

Keywords: *responsibility education, sustainability issues, game-based learning, board games, circular economy, global citizenship*

1. INTRODUCTION

In the past decades, the world's climate has been abnormal, and people have been greatly affected by their economic behavior and way of life. People start to rethink if to sacrifice the ecology for the prosperity of the various industries for a better life. Responding to the United Nations 2030 Sustainable Development Goal SDGs 4 "Quality Education," in addition to equal education for everyone, its deeper meaning can emphasize the "value-added" of education, that is, to ensure that all students can acquire the knowledge and skills required for sustainable development, including sustainable living models and global citizenship...etc. [1] Students' learning is not limited to the classroom, and are encouraged to go out of campus and stimulate environmental awareness. For example, in 2021, Taiwan had experienced the worst drought in history, followed by heavy rains in various counties and cities. The extreme weather can be described as a whole disaster for all citizens of Taiwan.

Thereby, Taiwan's a company overturned the outside world's imagination of environmental education. Elementary school teachers and students built an exploration ship that could become good friends with "fish", and finally successfully assisted Taiwan's native fish species to return to their hometowns and make the water ecology healthier [2].

Due to the rising voice of "global net zero carbon emissions", the fast fashion that seeks innovation and change in the past has been criticized. For this reason, the fashion industry abandoned the usual acrylic and fiberglass, and successively used recycled materials such as rice husks, coffee grounds, clothing waste and marine waste to make clothes hangers, display furniture and mannequins, successfully regenerating these wastes. As boutique clothing and shoes enter department store windows, they are the center of attention with a new look. This is the "circular economy," emphasizing a recycling system with recoverable and renewable resources. From the product design stage, they start thinking about how to reduce unnecessary

resource consumption. When the product enters the end of its life cycle, it can be recycled and reused.

Some enterprises and schools in Taiwan are committed to sustainable education, but sustainability issues are often difficult to be understood because of too many terms, such as: ESG, SDGs, GRI guidelines, etc. [3]. In order to spread this performance to all of Taiwan and let more people know more about sustainable education, we will decide to integrate it into the topic of sustainable education through game-based learning such as board games. Through experiential or game-based learning, people can have a deeper understanding of issues such as forest and marine environmental education, and use design thinking to solve problems. Implement SDGs Goal 4 through board games: Ensuring inclusive and equitable quality education, enabling all people to enjoy lifelong learning opportunities.

Game-Based Learning

Also known as entertaining learning, it is expected to achieve the purpose of entertaining and entertaining through the combination of games or toys and education. For example, in the practice of throwing a softball, a math problem is suddenly asked to the students, so that the students can come up with the answer based on experience and observation at the scene of catching the ball. Doing so is more effective than simply memorizing the multiplier table [4]. There are 3 advantages of game-based learning: 1) Improve learning motivation; 2) Experiential learning; 3) Have a more detailed understanding of the subject. To sum up, to use the game to induce motivation, so that learners can be more engaged in the thing, generate flow experience, and conduct in-depth learning.

However, there are three disadvantages, such as: 1) Addicted to the game; 2) Ignore the real learning goals; 3) Learn negative goals, such as violence, speculation, etc.

In the school scene, one of the easiest ways to see the use of game-based learning is board games. Through the theme and game mechanism of board games, students can reflect and learn during the game or after the activity.

Board Games

Board games are "table games". Modern board games are quite popular in Europe and America. The development of board games in Taiwan originated in the 1970s. Starting from simple card games and Monopoly, board games have long been linked with the development of education. Taiwanese board games are integrated into Taiwan's local characteristics, developing various types of exquisite and playable games, and also creating diverse talents and business opportunities, such as board game recreation stores, board game merchandise stores, board game planning and art design, etc. Industries have also sprung up. There are restaurants combined with board games. In addition to having a meal, you can also invite friends to play board games together. The board game restaurant is a good place for young friends to interact and communicate, and it is also a good place to relax [5].

Compared with mobile games that can be played at any time, board games are more casual games that can enhance interpersonal interaction, so they are called "unplugged games", which allow players to use their brains to enjoy the fun. Face-to-face interaction can give full play to the value of the game and create the life and emotion of the game. Usually only 2 to 4 people or more people can play a table game and can enjoy this happiness.

Board games can be divided into four types. “Puzzle games” focus on logical and conceptual challenges, “reaction games” focus on motor response skills, “balance games” focus on physical balance, and “memory games” focus on training memory.

Taiwan Companies and Universities Promote Responsible Education

The aforementioned Black Pine Company, a long-standing brand in Taiwan, cares about environmental public welfare. Through environmental education, it encourages students to make creative proposals, and also sees changes in children. The teachers who accompanied the whole process found that the children were taking care of climate change and wasting water resources more. The whole class also gathers solidarity and a sense of honor. They can reflect on everything better, and the children face setbacks from a more positive perspective [2].

In order to strengthen the connection and cooperation between the university and communities for practicing the social responsibility of the university, and cultivate college students who can create value for local development. Kun Shan University and partner schools lead teachers and students to form planning and implementation teams, and play a key role as a local think tank in regional development. Actively explore local needs and solve problems, assist regional integration through local advantageous division of labor and cooperation, and promote the innovative development of small and medium-sized enterprises and community culture. Through the learning process, college students also feel "needed by the community" and condense their recognition of regional development.

KSU has been committed to social services for a long time. Over the years, teachers and students of KSU have been served regional industrial settlements, industrial park counseling and transformation, humanistic and social practice, and local innovation. Sustainable implementation of the university's social responsibility, in line with the 17 United Nations Sustainable Development Goals (SDGs). Teachers follow the goal of SDGs, promote them to community residents, and students and try to keep in their minds for a long time [6].

2. BACKGROUND

Definition of sustainability issue board games

According to the type of sustainability issue board games in “Everland”, a Taiwan company of board game that has industry service experience of tourism, Non-profit organizations, government units, etc. and cooperated with some Taiwan universities. She organizes more than 140 workshops and train more than 7,000 people for sustainability concepts by using the sustainability board games which defines the three types as follows [7] and just shown in Table 1 as follows:

(1) *Sustainability puzzle board game*, in order to help players better understand the views of their partners on sustainability issues, everyone discusses with each other to strengthen their impression of sustainability issues. Double-sided duel is an example that it identifies effective sustainable investments and learn how to communicate across departments to execute long-term beneficial decisions.

(2) *Sustainability and reaction board game*, a game that is won by teamwork. Players must play the role of experts in the field of ESG (Environment, Social and Corporate Governance), and solve the problems of each city in combination with the SDGs of the United Nations to

build a sustainable city and eliminate potential risks. AR room escape is an example that players in the secret room, must find props to solve the puzzle, and then they can gradually find clues to escape from the secret room. After displaying the puzzle, they must use the knowledge of Sustainability to find the answer. Through the design of interesting activities, the learning of sustainable issues can also become interesting and exciting.

(3) *Sustainability strategy board games*, which allow players to identify games that are really effective strategies in long-term management. Players choose investment-friendly or opportunistic decisions, and each decision will affect the probability of the next investment success [3]. We take an example of "Step by Step" which is a team-based game to win. Players must play the role of experts in the three fields of environmental, social and corporate governance (ESG). Combined with the SDGs projects of the United Nations Sustainable Development Goals, they can solve the potential outbreak risks of each city and formulate together by using some needed strategies.

Research Methodology

We want to understand everyone's cognition and definition of sustainable issue board games. By designing a questionnaire and dividing it into two steps questionnaires to investigate the public's understanding, participation, type, and responsible for sustainability issues, a relative board game was used. There is a total of 200 students of Tainan community residents and Kun Shan University which include 100 college junior students participating in the leisure planning course, and 100 college sophomore students participating in the digital marketing course.

In this study, data was collected by way of questionnaires. 200 questionnaires were distributed from March 23 to April 23, 2021. Since they were distributed in the classrooms of the course, one-to-one was adopted, so it was a completely valid sample. The main purpose of the questionnaire is to find out what the respondents know about sustainability issues before playing board games with sustainability issues and whether they want to try board games with sustainability issues, and the most important factors to consider when playing board games with sustainability issues.

Basic Information and Personal Consumption Behavior

This article wants to know whether community residents and college students have an understanding of "sustainability". After experiencing board games, whether they truly understand the issue of sustainability issue and introduce the concept of sustainability their circle of life, and love of the earth together.

Among the 200 valid questionnaires, 35% were male and 65% were female. According to the research, about half of them have played sustainability issue board games (55.22%), and the majority (84%) want to try and experience sustainability issue board games, and the questionnaire shows that the top three types of board games they want to try named: sustainability puzzle type (51%), sustainability and reaction type (62%), sustainable strategy type (42%), the results show that respondents are very fond of "thinking type" and games related to "reaction type". From the interesting and fun board games, the feedback for the activities is also constantly praised, willing to deeply understand and care about sustainability issues, with the concept of sustainability, and the effect of sustainability board games is outstanding.

By driving the game, after the test subjects have experienced the sustainability board game, almost all members like this in-depth activity very much, like (63%), very like (33%), most of which are because of the sustainability board games can be discussed and interacted with the university members (91%), play with related clubs that promote sustainability concepts for loving earth, and the variety (67%) can bring joy and impression to players. Also many people because sustainability board games can train the reaction and activate the brain (68%), can learn the concept of sustainability from playing (60%) are very willing to promote sustainability board games to more friends; some people are willing to spend a little money to buy sustainability board games to have fun with their families because they are in love with sustainability board games, below NTD 2,500 (39.3%), and below NTD 5,000 (33.5%), as shown in Table 2.

Following the good result above, it's a good time for us teachers to have the responsibility to promote and educate students and community residents about sustainability issues by using relative board games. In the future, it will be extended to more communities' residents, causing more Taiwanese to care about sustainability, including the concept and the implementation of sustainability.

3. CONCLUSIONS AND SUGGESTIONS

Board games have been loved by teachers and students in recent years. They like to play together and enjoy a happy learning. The reasons for playing board games can be roughly divided into the following categories:

1. Increase interpersonal relationships: At least 2-4 people are required to play together as soon as the board game is opened, and this pair of friends who want to play board games can use this to get to know many playmates, so the world of board games can improve social skills, through more communication and interaction with others, make each other more emotional.
2. Effectively activate the brain: Most of the designs of board games have the functions of puzzle, education, challenge, and brain thinking, which can also make players use their brains to think more, and use their brains to think more, which can effectively stimulate brain cells to act, and then achieve prevent and slow down the occurrence of people suffering from dementia. At the same time, it can also enhance players' memory and logical thinking ability because they must memorize and understand the game rules and problems.
3. Train hand-eye coordination: First of all, you can use some reactive board games to increase the flexibility of the body. The most common one is: seeing the moment of the question with the eyes, and ordering the brain to make instructions to make the hands respond. Or give corresponding answers to train hand-eye coordination and reaction ability.
4. Sense of achievement and self-confidence: By fulfilling the required requirements in the game, the player can win the game, from not knowing at all, to being slightly and not very good, to winning the game, and even enjoying the game. This process not only represents the growth of the player's strength, but also the process of transforming a sense of achievement into self-confidence.

We add the element of sustainability issues to board games will enrich the concepts of protecting the earth, and train the brain power, concentration, reaction, memory, hand-eye coordination, etc. of the citizens. With the addition of sustainability issues, everyone can better

understand how to care for us. Living on the earth, sustainability and board games complement each other.

However, a board game cannot replace a book, nor can it replace a teacher's wisdom and all knowledge. One of the most important keys to using board games to assist learning is how to teach people how to play board games, and there is actually a trick to teaching how to play board games: teachers must play it themselves before teaching others. For example, the rules of the game, the precautions for playing or the operating mechanism behind it, teachers must have a deeper understanding of it through your actual play [8].

In Taiwan, some companies are willing to fulfill their social responsibilities, and so are universities. Kun Shan University has three teams, one of them was extended to Vietnam in 2020-2022, except for solving problems of air pollution, sewage and power saving of Yongkang Industrial Zone and neighboring areas in Tainan. Another teams have cooperated with Guantian District Office and NCKU to invest in research for making water chestnut shell into bio char- "Long shell charcoal". So far, it has achieved 419 tons of carbon reduction, produced 93 tons of diamond shell carbon, saved 11.7 million treatment costs, and processed 2,400 tons of waste water chestnut shells, which really solved the local environmental problems. In March, 2021, the team spawned the Youth Business Cultivation base "Lingtang Forest Living Hall" which set off a new atmosphere for local creation and entrepreneurship in the Guantian area [6].

Furthermore, actually, a board game is a new business opportunity for culture and creativity. Nowadays, Taiwan has become the second largest genuine board game market in Asia, and many players have started to invest in the development of board game products, starting from the participants of earlier games, so that Taiwan has accumulated professional talents in various fields of the complete board game industry [5].

From original board game designers (establishing game rule documents and art design) to raising funds through crowdfunding to produce commercialized physical goods; from factory production to publishers and distributors for channel sales; from online crowdfunding and online store promotion to offline board game store operation; from game instructor training to education board game teacher training, etc., Taiwan has all kinds of professional management talents in the complete board game industry chain. In specific analysis, Taiwan's original board games are richer and more solid, and more interesting in terms of game mechanism design, theme selection, and art style.

These entertainment board games can be integrated and transformed into sustainable educational development, and this seemingly small business can be transformed into huge educational and commercial market applications. The education value and market share created in the future are incalculable [9].

Finally, we wish to attract more people to participate in sustainability issues and get a better life.

Table 1 Sustainability Board Game Type and Characteristics

Type/Characteristic	Puzzle	Reaction	Strategy
Brain	Double-sided duel	AR room escape	Step by step
Physical Responses	Sustainability Ule Card	AR room escape	Double-sided duel

Friendship	Step by step	Sustainability Ule Card	AR room escape
Cooperativeness	Step by step	Sustainability Ule Card	Double-sided duel

Note: Board games are classified according to the characteristics of sustainable issues. Double-sided duel is a puzzle type; AR room escape is a reaction type; Step by step is a strategy type.

Table 2 Demographic Profile of the Respondents (N = 200)

		Number of People	Percentage
Gender	Male	130	65%
	Female	70	35%
Identity	Community residents	100	50%
	student	100	50%
Been to play sustainable BG	yes	110	55.22%
	never/want to	90	44.78%
Are they willing to play sustainable BG	yes	168	84%
	never/want to	32	16%
How do they discuss and interact when play sustainable BG (multiple selection accepted)	Relatives and Friends	74	37%
	University	182	91%
	Related Clubs	111	56%
What kind of sustainable type they like to play (multiple selection accepted)	Puzzle	102	51%
	Reaction	124	62%
	Strategy	84	42%
What fun and impressions board games can bring to players (multiple selection accepted)	Variety	134	67%
	Novelty	62	31%
	Easy to play	70	35%
What board games can train players (multiple selection accepted)	Brain	136	68%
	Physical responses	72	36%
	Friendship	28	14%
	Cooperativeness	56	28%
Willingness to play in-depth activity	like	126	63%
	Very like	66	33%
	N/A	8	4%
Will learn the concept of sustainability from play	Yes	120	60%
	No	80	40%
You are reluctant to use this site for the following reasons (multiple selections accepted)	Too troublesome	16	14.55%
	No Internet	2	1.81%
	Not practical	28	25.45%
	No popularity	64	58.18%
Willing to promote sustainability BG to more friends	Yes	128	64%
	No	72	36%
Average Monthly Salary	Below 20000	70	35%
	20001-27000	110	55%

	27001-35000	12	6%
	Above 35001	8	4%
Average expenditure on BG	Below 2500	79	39.3%
	2500-4999	67	33.5%
	Above 5000	54	27.2%

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