

*Design and Evaluation of an Educational Board Game for
Learning ESG Sustainability Challenges*

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Abstract

Towards the Paris Agreement underlines the need for net-zero carbon emissions by 2050, it has become more and more important for companies to transform and create an Environmental, Social, and Governance (ESG) sustainable development ecosystem. Moreover, there is a growing emphasis on educating and training employees in the concept of ESG. In addition to traditional lectures, game-based learning that encourages discussion and critical thinking is gaining traction. Through industry-academia collaboration with an international technology company in Taiwan, our research team designed an educational board game. The Learning goal is for learners to discuss and propose an action to solve the sustainability challenges for companies. Players can make final decisions through peer discussion which makes deeper understanding of ESG concepts and the ESG meanings of these companies' projects. The preliminary study was conducted with 24 Taiwanese office workers aged 20+ to 50 years old. The results of this study showed that the participants had significant improvement in their understanding of ESG, and the mean scores of flow, game elements, and game feedback were all significantly higher than the median of the scale (i.e., 3), while the learners' activity anxiety was significantly lower than the median, which indicated that the learners had low levels of anxiety about learning. The preliminary findings show that the game mechanism designed in this study is easy to operate and may not make learners feel anxiety and increases the flow of the learners. Through the feedback from open-ended questions in this study, players who experience ESG challenges with different people found it interesting and had a better understanding of the ESG concepts and companies' projects.

Keywords: ESG, ESG Board Game, Educational Board Game

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Introduction

Towards the Paris Agreement (UNFCCC, 2016) underlines the need for net-zero carbon emissions by 2050, it has become more and more important for companies to transform and create an ESG sustainable development ecosystem. High-quality ESG disclosures are essential to reduce the capital cost and risks, also much more important to improve corporate reputation (Wang et al., 2023, Dhaliwal et al., 2011). However, many people only know about CSR and have no idea about ESG. Therefore, the first step is to help employees and others understand what ESG is and what efforts the company can make in the field of ESG. Moreover, there is a growing emphasis on educating and training employees in the concept of ESG. In addition to traditional lectures, game-based learning that encourages discussion and critical thinking is gaining traction.

Through industry-academia collaboration with an international technology company in Taiwan, our research team designed an educational board game. The learning goal is for learners to discuss and propose an action to solve the sustainability challenges for companies. Players can make final decisions through peer discussion which makes deeper understanding of ESG concepts and the ESG meanings of these companies' projects.

The ESG board game consists of three types of cards, including action cards, challenge cards and event cards. Action cards describe the company's projects and their relevance to the field of ESG (Figure 1). Challenge cards describe the sustainability challenges for companies, such as climate change, energy crisis, the Corporate Sustainability Due Diligence Directive (CSDDD), and so on (Figure 2). Event cards describe the sustainability challenges that might happen in the real world, such as wildfires, floods, heavy rains and other disasters around the world, and so on (Figure 3).

There are ten rounds in this game. Each round, players are faced with three challenge cards and need to vote for a consensus action card to address one of the challenges. In odd-numbered rounds (not required in the first round), event cards need to be triggered to generate additional challenges. Just like in the real world, players have to face unexpected challenges.



Figure 1: One of the Action cards



Figure 2: One of the Challenge cards



Figure 3: One of the Event cards

Method

This study was a pilot study with 24 Taiwanese office workers aged 20+ to 50 years old.

The office workers were divided into groups of six individuals to play the ESG board game in the same room. The procedure of this study was as follows: introduction of the procedure for 5 minutes, pre-test for 5 minutes, the rules of the game for 10 minutes, the ESG board game activity for 35 minutes, and post-test and questionnaires for 10 minutes. The questionnaires included open feedback at the end, as well as measures for flow status (Kiili, 2006), game acceptance (Davis, 1989), and activity anxiety (Krashen, 1981), all of which were translated and revised by Hou and Li (2014) and scored on a five-point Likert scale. The pre-test and post-test use identical questions arranged in a different order to prevent a memory effect.

Results and Discussions

According to the Wilcoxon signed rank test analyses (Table 1). The results of this study showed that the participants had significant improvement in their understanding of ESG, and the mean scores of flow, game elements, and game feedback were all significantly higher than the median of the scale (i.e., 3), while the learners' activity anxiety was significantly lower than the median, which indicated that the learners had low levels of anxiety about learning.

Table 1: Wilcoxon signed rank test analyses

Dimension	<i>M</i>	<i>SD</i>	<i>Z</i>	<i>p</i>
Pre-test	12.46	4.18		
Post-test	15.17	2.50	-2.44*	.015
Usefulness	4.35	0.59	4.24***	.000
Ease of use	3.74	0.76	3.43***	.001
Game elements	3.83	0.68	3.86***	.000
Sense of control	3.75	0.79	3.29**	.001
Uncertainty	3.96	0.75	3.76***	.000
Achievement	3.79	0.72	3.58***	.000
Think the game was fun	3.88	0.85	3.46***	.001
Wish to play again	3.75	0.94	3.07**	.002
Overall Flow	3.87	0.59	4.19***	.000
Flow antecedents	3.89	0.56	4.15***	.000
Flow experience	3.86	0.65	4.02***	.000
Activity Anxiety	2.34	0.59	-3.771***	.000

* $p < 0.05$, ** $p < 0.01$

The preliminary findings show that the game mechanism designed in this study is easy to operate and may not make learners feel anxiety and increases the flow of the learners. Through the feedback from open-ended questions in this study (Table 2), players who experience ESG challenges with different people found it interesting and had a better understanding of the ESG concepts and companies' projects.

Table 2: Parts of the open-ended feedback

Participant No. (#PN.)	Open-ended feedback
#P04	Through this board game, I have a better understanding of ESG's concept of sustainable management, and a better understanding of the issues related to the company's projects.
#P06	I feel that this game is well-prepared with thoughtful design, and the atmosphere is also very pleasant. I had the opportunity to get to know colleagues from different departments and gain a better understanding of ESG through this game. I would be interested in participating again if given the chance. Thank you!
#P11	It's interesting to learn more about what ESG is.
#P16	The game is interesting, and it's a fun experience to play it with different people.

Conclusions

This study is designed to develop an ESG board game that is both useful and enjoyable. The results and preliminary findings indicate that learners acquired ESG concepts through this board game. Furthermore, the game helped learners understand that their actions in their daily tasks and work have meaningful impacts on the environment. Future studies will compare the effectiveness of applying technical tools with ESG scenarios to that of this board game.

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