

EXPERIMENTAL APPROACH FOR GAME DESIGN: ONLINE AND ANALOG GAME FUSION IN THE CORONA ERA

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ABSTRACT

The Covid-19 epidemic, which struck the world in early 2020, strongly affected analog gaming researchers and practitioners. Social distance was recommended for reducing infection risk. Many people have avoided surrounding tables. Furthermore, disinfection is required for objects that have been touched by others. These precautions all degrade the analog game experience. Analog games will disappear if nothing is done. Therefore, the authors examined methods to apply the virtues of analog games to online lectures.

INTRODUCTION

The Covid-19 epidemic, which struck the world in early 2020, strongly affected educational institutions worldwide. The idea that "students go to school, learn with friends, and acquire sociality outside of the university," which was common until 2019, has disappeared. All studies have been replaced with online lectures. Subsequently, we have been returning gradually to earlier days while coping with Covid-19, but the old days will never come again. Educators and students of tomorrow might have no choice but to accept a new lifestyle while adapting to Covid-19. This future also presents a situation in which analog gaming researchers and practitioners' worth are questioned. By mourning those losses from Covid-19 forever, forward progress would become impossible. Therefore, the authors have considered and practiced the ideal mode of analog games adapted to the new lifestyle.

Analog games and digital games have been incompatible. Researchers have developed and practiced games in line with their research. As analog game researchers, the authors have produced many games and have reported their effectiveness. Tanabu et al. provided other researchers with a platform for creating digital games and demonstrated its effectiveness. In this way, many studies have long assessed their characteristics. Nevertheless, studies of analog game and online lecture fusion have not reported in the relevant literature.

If researchers aim to integrate analog games and digital games, then it seems that they will end up with digital games. To adapt to the Corona era, analog game researchers and practitioners must make innovations for analog games' operation methods with the goodness of analog games through the internet. The authors have produced lecture designs for fusion of analog games and online as shown in Fig.1 and apply them to university lectures. This paper presents that method and results.

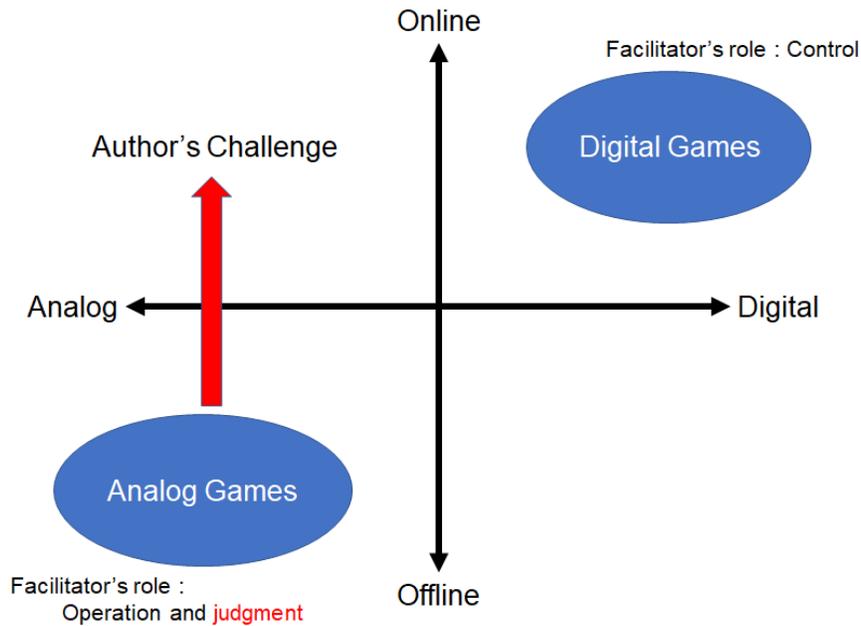


Fig. 1 Concept of the Author's Challenge.

ISSUES RELATED TO ANALOG–DIGITAL GAME DIFFERENCES

As might be well known, digital games have higher compatibility to the Corona era than analog games. How should a researcher playing an educational analog game behave during the Corona Era? A new challenge of analog games is required. Therefore, to resume education using analog games, one cannot merely say that we are abstractly concerned about safety. You will not be treated well by the other party if you do not identify risks and clarify them to society as in the guidelines.



Fig. 2 Analog Game Seminar.

Figure 2 portrays an image showing the old days of an analog game seminar. By comparing differences between analog games and digital games, the authors can identify requirements for analog games in the Corona era.

1. Digital games have no physical appearance. By contrast, boards and cards are used for analog games.
2. Digital games can be played via the internet. By contrast, analog games are physically assembled.
3. In digital games, it is fundamentally important to exchange data with the host. Communication among participants is auxiliary. By contrast, in analog games, communication among participants is crucially important.

Anyone can understand these points. "Analog vs. digital" has long been discussed in academic societies. Why is that a difficulty in the Corona era?

1. People touch boards and cards
In the Pre-Corona era, people shared various objects in daily life and touched them by hand. By contrast, in the Corona era, people try to avoid touching things to the greatest degree possible. They wash their hands after touching them. Those who provide such objects that must be touched wipe them off to the greatest extent possible with disinfectants. Such measures are also necessary for board games and card games. When a turn is over, collecting all the parts and disinfecting them one-by-one is unavoidable.
2. People gather in small spaces
In the Pre-Corona era, there were many small, dense, and poorly ventilated areas: packed buses, movie theaters, classrooms, etc. Future students might avoid classrooms where analog games are played as such places. We gave no concern at all to whether the room had a window or adequate ventilation. The future will require new efforts to secure as large a classroom as possible, keep the participants mutually separated, and open the doors and windows. It will also be necessary to formulate criteria to be implemented, such as opening doors every 30 min.
3. People talk at short distances
During the last nine months, most people have come to wear face masks. Although it cannot be expected to have the effect of preventing infection, it can prevent other people from being infected by droplets. No one can say that a person can remove a mask in the game. Therefore, is it okay to have unlimited conversations by wearing a mask? One can avoid playing games in silence if one wears a mask. However, unlike the Pre-Corona era, considerable restraint is required. Moreover, nobody can say for certain how much caution is justified.

All contact and close activities engender some risk of infection. No person can reasonably deny a risk and assert that "No, that's not the case." The authors understand the desire to say, "If you say that, you're in trouble." However, that is only postponing a decision. Unless people feel an "atmosphere of the Corona society" and explain it to make it acceptable, analog games' sustainability will be threatened. The authors infer that the three risks can be avoided. Unfortunately, development of guidelines for analog gaming has not begun. Most higher education institutions have adopted online lectures and face-to-face lectures with many restrictions. Based on this reality, a more realistic solution might be suitable for the Corona era.

EXPERIMENT CHALLENGES FOR ANALOG AND ONLINE GAME FUSION

Since 2007, the authors have developed various original business games, called Business Accounting School for Entrepreneurs (BASE) business games, for participants to learn business management. They can experience business management virtually and can acquire tacit knowledge related to business management through experience. The authors have developed business games of 17 types, including Manufacturing (BMG), Software Kaihatsu Game (SKG), and Supply Chain Collaboration (SCC). Figure 3 presents an image of the BASE business game (BMG).

The authors recognize that the following policies are fundamentally important when learning knowledge related to management from education using business games.

- To limit what you teach, stop what you have difficulty doing. Learn what you teach only for fundamental management knowledge.
- Enjoy playing.
- Complete the game in about 10 hours.
- Motivate studies for learning management continually.



Fig. 3 BASE Business Game.

Our BASE business game, a board game, has participants play face-to-face in a battle format. The gameplay environment becomes an exciting place. Some mistakes and irrational decisions might occur. The accounting process using pencils and calculators might also be affected by calculation errors, entry errors, and cost accounting omissions. These actions might engender catastrophic failures such as a lack of funds. The authors find it worthwhile to experience such mistakes and absurdities because such mistakes and absurdities can occur in real business world. Therefore, it is important to address them suitably.

During the first semester of the 2020 academic year, the authors planned a lecture using an analog game, but the lecture was forced to be conducted online because of the Corona disruption. Nevertheless, the authors had no time to change the lecture plan. Therefore, the analog business game was conducted using Zoom to maintain the quality of analog games to the greatest degree possible.

The authors have been considering answering the question, "How to educate students using analog business games in online lectures." For operation of lectures, the authors devised the following.

1. Distribution of rule books and sheets by mail
 Because the authors had the opportunity to send documents before the start of the online lecture, the printed "rule book," "cash flow sheet," "financial statement," and "company board" were sent to students. The student environment must be considered. First, the rule book alone has 30 pages. It did not seem easy to print such a large amount of data in-house. Furthermore, the A3 size is desirable for "cash flow sheets" and "financial statements" because they are easy to fill in, but no such A3 printer is available to ordinary households. There is no need to print all the materials if all students have a personal computer. They can comfortably record it by sending the sheets as a file and opening it with spreadsheet software. However, by calculating the figures automatically and by filling them in, the opportunity to think about the numbers' meaning is lost. It is also possible that most students only have smartphones. Therefore, it is also difficult to check the rules and record it on the same device while taking an online lecture on the device and proceeding with the game.
2. Company board
 The company board, which shows the simulated company's current status, will be operated by the facilitator as the game progresses. First, the authors tried to show them through a web camera. The authors tried to show all the company boards at once. However, the company board became too small. Students were unable to see the small parts. To make it appear larger, it was necessary to switch the shown target frequently. Switching was too complicated. Furthermore, it was not easy to play the game facilitator and the photographer simultaneously. Therefore, the authors asked the students to keep a copy of the company board and reproduced the situation.
3. Parts
 Parts representing materials, machines, employees, etc. were not distributed. The authors asked students to use small items that they own at home as a substitute.

4. Game operation

Students' choice is either "decision-making" or "trouble" by drawing the cards. However, students may be suspected that the facilitator may arrange the cards artificially to improve (or worsen) the draw of a particular student. In face-to-face lectures, after having multiple students shuffle the cards to eliminate the feeling of unfairness, the cards were piled up in one stock. However, it is not easy to apply the same procedure in online lectures. Therefore, the cards were divided into three stocks after shuffling. The facilitator asked the students to select the stock of cards as "left, center, right" in the students' turn. They would be strongly aware that they had made a decision by this mechanism.

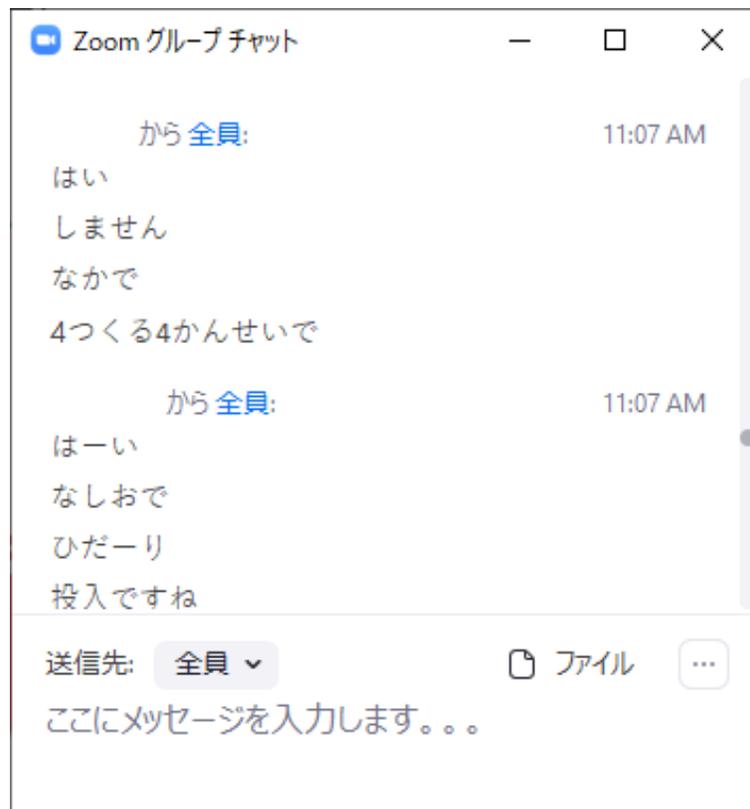


Fig. 4 Picture of Zoom's Chat (in Japanese).

Furthermore, because oral game progress might cause inconsistencies in overhearing information, the authors used Zoom's chat function, as depicted in Fig. 4, and obtained complementary information by text before announcing it to all students.

Settlements were made at the end of each game year. Finally, the authors checked whether "total assets = total capital" was on the balance sheet (B/S) or not. The accounts' settlement quality can be confirmed, as portrayed in Fig. 5, students must send an image of the balance sheet (B/S) part of the financial statements.

F:未処分利益算出		税引前 当期利益 51	
<貸借対照表B/S>			
現金	224	未払法人税	0
製品	37	借入金	0 ←(才)
仕掛品	0	自己資本	351
材料	0	資本金	300 ←(力)
機械工具	90	次期 繰越利益	51 ←
総資産	351	総資本	351

Fig. 5 Image of a Balance Sheet (in Japanese).

When conducting a university lecture, it was possible to apply the method presented above because it can take much time. However, during a short session such as a one-hour gameplay session, it is difficult to pre-distribute the necessary prints. Spending much time explaining the rules leaves little time to enjoy the game. Therefore, the authors attempted to conduct a one-hour session using a webcam and a blackboard, as presented in Fig. 6. During the first 20 min, the authors explained the game using PowerPoint. During the next 40 min, participants were able to experience the game while receiving advice on the game procedure in order. In this case, it was run by two people: one was in charge of facilitation; the other was in charge of switching cameras. Information related to the company board and market board can be shared with participants while avoiding excessive burdens on the computer by moving one webcam. It might be one realistic solution.



Fig. 6 Image of an Online Broadcast.

After the session, the authors received the following comments from participants by chat and e-mail.

- Despite being online, it had a tangible analog atmosphere. I was looking at it with a very strange feeling. I got the impression that the facilitator and the player are human beings. Using realistic tools, everyone creates human warmth and relationships together (by e-mail).
- I find it a very nice engaging and good game to teach business students. enjoyable to play this way, very clear, also nice, good clear feedback mechanisms, good instruction from the facilitator, love your humor for me it worked very well (by chat).

DISCUSSION

By making various efforts as described in the preceding section, two important issues were identified.

1. Fairness of facilitators
In the Pre-Corona era, the facilitator's primary role was to resolve difficulties as the game progressed. Once the facilitator teaches the game's rules, the students themselves can operate the game. By contrast, in the Corona era, the facilitator always controls the game's progress remotely. In this case, the facilitator wants to advise the student's decision-making because the facilitator has many game experiences in the past. This action presented no difficulty in practice games, but it makes the students feel that lectures with a grade evaluation are unfair. The facilitator also needs to be very careful not to raise any suspicions about a particular student having a good (or bad) scenario. Ensuring fairness as a facilitator is a more important issue compared with analog games.
2. Differences for the degree of understanding the rules
When we got together and played analog games, we were able to correct misunderstandings of the rules and mistakes easily. Online, persistently asking students for confirmation can take a long time to make any progress, which makes students uncomfortable, and which reduces the game's enjoyment. In addition, the students themselves do not know where they lack understanding of the rules, so they do not know what to ask. It is distressing to ask the facilitator even if it interferes with others' play. Therefore, the game progresses without accurate understanding of the rules. Games that do not evaluate students with grades present no difficulty, but accuracy is extremely important for games by which grades are tabulated. For that reason, the facilitator asked them to take a picture of their cash flow sheet and financial statement every time they settle their accounts and send them as attachment files by e-mail. Sufficient accuracy must be ensured by the facilitator checking the file.

In the Pre-Corona era, once participants got used to the game to some extent, the facilitator could leave the game's progress to the participants' consensus, which led to the creation of an atmosphere in which all the participants could agree and enjoy. However, as discussed above, in the Corona era, such a thing is difficult. The facilitator's facilitation skills will be more important than ever in advanced games of analog and online game fusion.

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