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BlendMaster: A Collaborative Board Game for Training Teachers in Blended Learning

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BlendMaster: A Collaborative Board Game for Training Teachers in Blended Learning

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Abstract. Blended learning (BL) combines face-to-face and computer-aided resources, promoting students' engagement and independence. However, teachers may struggle due to a lack of technological skills and pedagogical challenges. Serious games have proven to be an efficient tool for enhancing teachers' training, providing immersive and interactive learning experiences, and allowing teachers to develop classroom management strategies in a risk-free environment. We present the design and implementation of BlendMaster, a collaborative board game for training teachers in BL. The game challenges players to make decisions, addressing classroom challenges in both face-to-face and online settings. By exploring the game's mechanics, dynamics, and aesthetics, we foster reflection on BL while creating an engaging experience. Feedback from players during a training session shows BlendMaster is positively received by teachers and provides insights for further improvements and future directions for the game.

Keywords: teacher training · blended learning · board game

1 Introduction

This paper presents the design and implementation of BlendMaster, a board game that addresses teachers' training needs in blended learning (BL). Players are invited to navigate complex decision-making processes and address challenges that arise in both face-to-face and online settings. We explore possible strategies to foster reflection upon BL while attempting to create an engaging and enjoyable experience. Furthermore, we examine the feedback players provided during a training session, highlighting potential improvements and future directions for the game.

1.1 Blended Learning and the 21st-Century Education

Blended Learning can be defined as a learning process that combines face-to-face and computer-aided learning [1]. Previous research demonstrates that efficiently implementing BL techniques in the classroom can result in a constructivist learning experience, potentially increasing students' motivation [2]. A study conducted in an Australian university suggested BL can foster classroom engagement, leading students to spontaneously initiate discussions, besides offering more flexibility and interaction between

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teachers and students [3]. However, the same study makes it clear there is a need for instructors to be flexible to adapt when technology fails, being able to provide a workaround solution. One of the main challenges behind blending a course is the lack of teachers' training. A systematic review of previous literature demonstrated that teachers face technological literacy and competency challenges [4], which can lead to a lack of self-confidence and avoidance of adopting BL techniques [5].

1.2 The Impact of Game-Based Learning on Teachers' Training

Previous literature suggests teachers have positive perceptions about game-based training, improving their confidence after playing [6]. Serious games offer a dynamic platform for educators to develop pedagogical skills and classroom management strategies in a risk-free environment, where trainees can replay teaching scenarios many times [7]. Pre-service teachers often struggle with limited practical experience. Games can serve as effective simulators, immersing them in scenarios requiring developing problem-solving skills and refining critical thinking abilities [8]. However, not all game designs are equally effective in facilitating teachers' learning process. Previous studies have focused on the effectiveness of serious games in business training contexts [9], often leveraging competitive mechanics inherent in many games. This approach may not be conducive to the educational environment [10]. The flexible nature of game design allows the implementation of collaborative gameplay, which would be more suitable and beneficial for teacher training. Teachers can actively participate in the learning process by emphasising collaboration and fostering a supportive and cooperative environment conducive to their professional growth.

2 The BLITT Project

The present study was carried out in the context of the BLITT (Blended Learning International Train the Trainer) project. BLITT is an initiative by organisations from five European countries designed to support educators with the necessary knowledge and skills to implement and facilitate BL classrooms [11]. The goal is to train educators to become BL champions capable of disseminating their knowledge to train and motivate other teachers. The project is developed in two phases. First, teachers access materials and courses on BL techniques to blend their courses and register the process as case-study documents. Second, teachers develop and implement their own BL training courses for other teachers. The current paper presents the design and testing of a prototype of BlendMaster, an educational game board used as part of teacher training in the first phase of the BLITT project.

3 BlendMaster Game Design

The BlendMaster is a collaborative board game where players team up to propose teaching solutions combined with technological tools to specific classroom challenges that emerge from the BLITT case studies. The goal is for teams to cooperate, make informed

decisions, and progress through the game by effectively supporting other teachers to blend their classes. BlendMaster aims to enhance teachers' understanding of BL and stimulate critical thinking and problem-solving skills within a collaborative learning environment.

3.1 Components

A high-fidelity prototype was designed and implemented as an analogue board game to evaluate the potential of BlendMaster as a teacher training tool. The BlendMaster game is composed of:

- a six-sided dice
- a game board with a *Start* space (players' tokens are positioned here at the beginning of the game), a *Finish* space (when a team token reaches this space, the game is over), empty spaces (no action is expected from the player), *Blend it!* spaces (the team needs to draw a *Blend it!* card), an *Oh, no!* spaces (the player needs to draw an *Oh, no!* card)
- playing cards
- game coins
- miniatures representing each team

3.2 Mechanics

Players team up and decide who will start. The game is played on a physical board, where players move the miniatures representing each team across different spaces. At the beginning of the game, each team receives:

- 3 *Solution* cards: present possible solutions for the classroom problem faced in the game.
- 3 *Technology* cards: presents a BL technology and its definition.
- 2 *Empty* cards: players can use blank cards to suggest solutions or technologies not found in their *Solution* and *Technology* cards.
- 8 coins that can be used to buy new cards

Figure 1 shows the different cards present in the BlendMaster game.

Once the game begins, miniatures representing each team are positioned in the *Start* game board space. The first team rolls the dice and moves the miniature according to the result. If they land on an empty space, their turn is over, and the next team rolls the dice. If they land on a *Blend it!* space, they need to draw a *Blend it!* card that contains a short statement describing a situation faced by one of the personas created based on the BLITT real-life case studies. Once the playing team draws a *Blend it!* card, they read it out loud and take some time to discuss among the team members which of the three *Solution* cards in their deck could be used to solve that case and move the miniature one space forward. If they combine the chosen *Solution* card with a *Technology* card, they can move two spaces forward. They can also use their blank cards to create other solutions or technologies. After selecting the cards and elaborating on the strategy to solve the challenge, the team shares their idea with the other teams. However, this is not enough to move forward on the board as the other teams now have two choices: to accept the strategy proposed by the playing team or to suggest another solution based on their

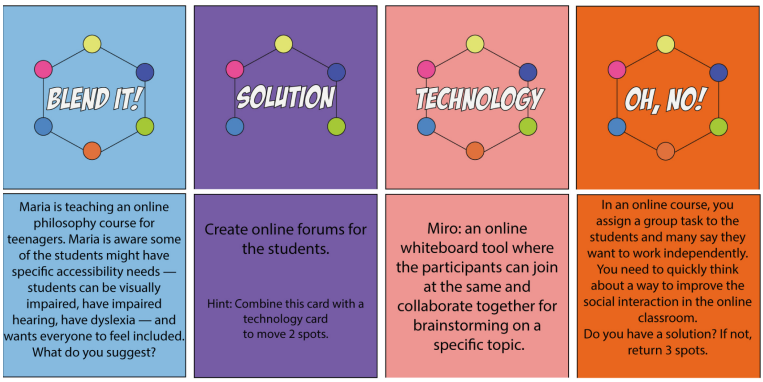

Fig. 1. Examples of the *Blend it*, Solution, *Technology*, and *Oh, no!* cards.

own deck of cards. If all teams agree that another team provided a better solution than the playing team, this other team takes the turn and rolls the dice. The playing team will not progress on the board.

Teams can also land on the *Oh, no!* spaces, where players must draw a card that describes teaching situations where a problem arises during the blending process. For example, it could describe an instructor teaching online and receiving an email from a student complaining about the lack of social interaction and saying they want to leave the course. Differently from the *Blend it!* card, teams must provide a solution to the *Oh, no!* cards, and the other teams must agree that it is suitable. In this case, the other teams cannot suggest a solution. If the playing team does not provide a suitable solution, they must return three spaces on the board. For both *Blend it!* and *Oh, no!* cards, players are allowed to use the coins they received at the beginning of the game to buy new cards in case they are unhappy with the ones they got. Each team should always have at least a deck of eight cards for every turn (three *Solution* cards, three *Technology* cards, and two blank cards). Rolling the dice in turns, drawing cards and proposing solutions continues until one team reaches the *Finish* space, winning the BlendMaster game.

3.3 Implementation

In the Spring of 2023, a gameplay test of the BlendMaster took place during the BLITT training week. 22 teachers attended the event and played the game in teams of five or six players. The participants came had a wide range of experience and came from various backgrounds: some teachers worked with primary and secondary school students, others with university students, and others on adult learning. The game board was placed in the centre of the room, and the teams were distributed around the board. A team representative approached the board to roll the dice and draw the cards. After the gameplay, an online survey was distributed and responded by 19 participants. The survey had two open questions: “Did the board game (BlendMaster) help you to reflect upon the challenges of blended learning?” and “Do you have suggestions to improve it?” The feedback was highly positive, and participants stated the game was an excellent tool for brainstorming and identifying unresolved issues related to BL. Participants proposed incorporating a

faster version of the game focused solely on the cards, removing the board and implementing a timer, allowing for a more time-efficient gameplay experience. Some players suggested an app-based system where teams could anonymously propose solutions to the blending challenges, enabling virtual voting for the best solutions. One participant noted that certain solutions proposed in the game might not be applicable or preferred depending on the context. This concern was expected, considering the project includes educators from five countries. Participants expressed a desire for the game to be adaptable to educational contexts besides BL, such as vocational education and training. Regarding logistics, participants suggested creating more copies of the game to accommodate larger groups and allowing groups to keep written records if necessary. They also mentioned the importance of increasing engagement and involvement from the outset, possibly by modifying the game to be less teacher-controlled. Overall, the feedback highlighted the effectiveness and value of the BlendMaster board game in facilitating reflection on BL challenges. The suggestions provided valuable insights for improving the game, including enhancing its dynamics, adapting to different cultural contexts, and ensuring flexibility for various educational settings.

4 Conclusion and Future Work

BlendMaster encourages critical thinking and fosters engagement by providing a platform for teams to debate possible solutions from different perspectives. The competitive element, wherein teams can propose their solutions during their opponent's turn, motivates continuous reflection and discussion even when it is not their team's turn. The availability of multiple copies of the game is crucial to effectively disseminate the game and enable widespread implementation in teacher training. This ensures that all teachers can actively participate in the game-based learning experience. Concerning the game mechanics, implementing coins as an award for progressing in the game is considered for future iterations. To address this issue, future work should explore the possibility of launching a digital version of the game as a second-screen experience could be considered, leveraging technology to overcome logistical limitations and enabling a more scalable and accessible implementation in various training contexts. The digital version could also allow the trainer to input personalised challenges, solutions and technology cards, adapting the game to different contexts.

References

1. Lalima, D., Lata Dangwal, K.: Blended learning: an innovative approach. Univers. J. Educ. Res. **5**, 129–136 (2017). https://doi.org/10.13189/ujer.2017.050116
2. Zhang, R.: Exploring blended learning experiences through the community of inquiry framework. Lang. Learn. Technol. **24**, 38–53 (2020). http://hdl.handle.net/10125/44707
3. McKenzie, S., Hains-Wesson, R., Bangay, S., Bowtell, G.: A team-teaching approach for blended learning: an experiment. Stud. High. Educ. **47**, 860–874 (2022). https://doi.org/10.1080/03075079.2020.1817887
4. Ashraf, M.A., et al.: A systematic review of systematic reviews on blended learning: trends, gaps and future directions. Psychol. Res. Behav. Manag. **14**, 1525–1541 (2021). https://doi.org/10.2147/PRBM.S331741

5. Philipsen, B., Tondeur, J., Pareja Roblin, N., Vanslambrouck, S., Zhu, C.: Improving teacher professional development for online and blended learning: a systematic meta-aggregative review. Educ. Technol. Res. Dev. **67**(5), 1145–1174 (2019). https://doi.org/10.1007/s11423-019-09645-8
6. Ragni, B., Toto, G.A., di Furia, M., Lavanga, A., Limone, P.: The use of digital game-based learning (DGBL) in teachers' training: a scoping review. Front. Educ. **8** (2023). https://doi.org/10.3389/feduc.2023.1092022
7. Connolly, T., Tsvetkova, N., Hristova, P.: Gamifying teacher training: simulated practice learning for future and practising teachers interacting with vulnerable learners. In: Bradley, E. (ed.) Games and Simulations in Teacher Education, pp. 55–73 (2020). https://doi.org/10.1007/978-3-030-44526-3_13
8. Hixon, E., So, H., Hixon, E., So, H.: International forum of educational technology & society technology's role in field experiences for preservice teacher training published by: international forum of educational technology & society linked references are available on JSTOR for this artic. J. Educ. Technol. Soc. **12**, 294–304 (2009)
9. Mayer, I., van Dierendonck, D., van Ruijven, T., Wenzler, I.: Stealth assessment of teams in a digital game environment. In: De Gloria, A. (ed.) GALA 2013. LNCS, vol. 8605, pp. 224–235. Springer, Cham (2014). https://doi.org/10.1007/978-3-319-12157-4_18
10. Pozzi, F., Persico, D., Collazos, C., Dagnino, F.M., Munoz, J.L.J.: Gamifying teacher professional development: an experience with collaborative learning design. Interact. Des. Archit. **29**, 76–92 (2016). https://doi.org/10.55612/s-5002-029-004
11. Gordon, D., Doyle, P., Becevel, A., Baloh, T.: All things merge into one, and a river runs through it: exploring the dimensions of blended learning by developing a case study template for blended activities. Int. J. e-Learning Secur. **11**, 648–656 (2022). https://doi.org/10.20533/ijels.2046.4568.2022.0081