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NAVIGATING THE TRANSITION OF A MATHEMATICAL DIDACTIC GAME FROM TABLETOP TO DIGITAL

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Abstract
Game-based learning is gaining prominence across various educational levels due to its ability to accommodate the preferences commonly exhibited by Generation Z students for visual and experiential learning. Game-based methods are applicable in digital platforms and traditional classroom settings alike, with digital GBL typically taking the form of immersive video games, while non-digital GBL is generally represented by tabletop games. This paper aims to provide an examination of the most significant advantages and drawbacks associated with digital and non-digital didactic games. Subsequently, an overview of the game mechanics of Blue Yeti, a didactic card game designed to familiarise university students with the direct comparison test of improper integrals, will be provided. Finally, the challenges encountered during the digitalisation process of Blue Yeti will be described, outlining the key considerations involved in transitioning a mathematical didactic game to a digital format.

Keywords: *game-based learning, card games, digitalisation, educational technology, improper integrals, infinite series*

1. Introduction

Learning styles encompass the cognitive, affective, and physiological characteristics that shape how individuals perceive and interact with learning environments (Keefe, 1987). VARK, introduced by Fleming in 1995, is a framework for categorising learning styles on a sensory basis, outlining four distinct perceptual modes: visual, aural, read/write and kinesthetic. Fleming (2001) defines learning styles as an individual's preferred methods of acquiring and processing information. While students may exhibit preferences for one or more perceptual modes, they can also adapt to and function within other modes.

Visual learners, as described by Fleming (1995), prefer information presented visually, including images, animations, graphs, charts, and flowcharts. Aural learners, on the other hand, favour auditory experiences such as listening to speeches, lectures, and participating in discussions. Those classified as read/write learners lean towards textual mediums for information acquisition, such as reading textbooks, note-taking, and composing written assignments. Finally, kinesthetic learners prefer engaging in hands-on experiences and manipulating objects as a means of gaining insight into new concepts. Multimodal learning, therefore, refers to a combination of various perceptual modes, including visual, aural, read/write, and kinesthetic.

In recent years, the investigation into the learning styles of Generation Z has garnered significant attention. Ishak, Ranganathan and Harikrishnan (2022), in their study involving 300 undergraduate students born after 1994, concluded that the kinesthetic modality is the preferred learning style among university students. Ally, Pillay and Govender (2022) reached the same conclusion after examining the learning preferences of 495 students in South Africa. In contrast, Fortuna and Caraballe (2021) discovered, in their sample of 212 students, that participants exhibiting a dominant visual learning style significantly outnumbered those favouring other modalities. This diverse array of findings emphasises the absence of a consensus regarding the preferred learning style of Generation Z, with both the visual and the kinesthetic perceptual modes emerging as prominent. Nonetheless, most researchers (Farman, 2023; Ishak et al., 2022; Ally et al., 2022; Ridwan et al., 2019) agree that students typically exhibit a multimodal learning style, favouring multiple perceptual modes presented in the VARK model.

The importance of comprehending and accurately evaluating learning styles lies in the necessity to tailor teaching materials to students' individual preferences, thereby improving learning outcomes (Othman & Amiruddin, 2010). Consequently, understanding students' learning preferences is essential for devising effective teaching strategies. Present-day classroom settings predominantly cater to aural learners through lectures, presentations, and oral assessments, as well as to students inclined towards the read/write modality through note-taking requirements, mandatory or optional readings, and written evaluations. However, the general preference of Generation Z for kinesthetic and visual learning indicates a need for integrating novel approaches into higher education, such as game-based learning (GBL).

Game-based learning is defined by Qian and Clark (2016) as "an environment where game content and game play enhance knowledge and skill acquisition, and where game activities involve problem-solving spaces and challenges that provide players/learners with a sense of achievement". Dahlin, Fenner and Cruickshank (2015) enumerate numerous skills acquired during gameplay, including the development of systemic thinking, decision-making, and communication skills. Burghardt (2014) refers to gameplay as an important, albeit not exclusive, means of improving cognitive performance. Game-based learning particularly benefits kinesthetic and visual learners due to its interactive nature. The dynamic aspect of games provides kinesthetic learners with opportunities for hands-on engagement. Likewise, the visual elements of games cater to the preferences of visual learners, aiding in their understanding of course materials through visual cues.

Game-based learning manifests itself in two primary formats: digital GBL encompasses computer games created for educational purposes, while non-digital game-based learning refers to traditional tabletop games (Wiggins, 2016). Both formats present multiple advantages and challenges, the choice between them depends on the learning objectives, the environment, and the preferences of the participants.

2. Non-digital game-based learning

Traditional, tabletop didactic games offer several advantages in educational settings. Firstly, these games can be integrated into traditional classroom environments, as they do not rely on electricity or internet access. This makes them particularly suitable for use in establishments with limited technological resources. In addition, tabletop games promote cooperation and communication among the players. Through gameplay, students learn to work together towards a common goal, developing collaboration skills that are essential for success in both academic and professional settings. These games also provide an opportunity for students to practise the use of topic-specific terminology in a practical context. Another significant strength of non-digital game-based learning lies in its tactile nature, which appeals to kinesthetic learners. The physical manipulation of game pieces engages students on a sensory level, making the learning experience more memorable. Furthermore, tabletop games offer great flexibility in adapting game rules to meet the specific needs of the players. Educators can modify the game mechanics, difficulty levels, or objectives to accommodate different learning styles and skill sets.

However, non-digital game-based learning also has its drawbacks. One limitation is the need for the continuous presence of facilitators to provide feedback and supervision during gameplay. This requires additional manpower, which may not always be feasible, especially in larger classroom settings. The physical components of tabletop games impose further constraints on the maximum number of players who can participate simultaneously. Moreover, tabletop didactic games may pose logistical challenges in terms of space and resources, limiting the scalability of non-digital game-based learning initiatives.

3. Digital game-based learning

Akin to tabletop games, digital game-based learning also offers a multitude of advantages. Immediate feedback is a key feature of computer games. Through embedded assessment mechanisms, students can receive instant feedback on their performance, eliminating the need for intermediary actors such as teachers or peers. This real-time feedback loop not only facilitates learning but also empowers students to self-assess and adjust their learning strategies accordingly. Scalability is an important strength of digital GBL. Unlike traditional classroom activities that may be constrained by physical space or resources, computer games can accommodate larger groups of learners simultaneously. Accessibility is another key advantage of digital gaming. Beyond instructional time, students can access online games from the comfort of their homes, providing opportunities for additional practice outside the traditional classroom environment. Furthermore, the immersive graphics and interactive elements of digital games help maintain students' attention and motivation over time, catering mostly to the needs of visual and kinesthetic learners.

In addition to these advantages, digital GBL can contribute to the work of researchers and educators as it facilitates comprehensive progress tracking, enabling teachers to collect data on student performance. This allows educators to analyse trends, identify areas for improvement, and make informed instructional decisions, ultimately enhancing the effectiveness of teaching methods.

However, digital GBL is not without drawbacks. Despite the immediate feedback provided by digital games, there may be limited opportunities for students to seek explanations or ask for help. This lack of human interaction and support mechanisms may hinder students' ability to overcome obstacles. Moreover, teachers have less control over the gameplay in digital GBL compared to traditional classroom activities. The autonomy of students in digital environments may raise concerns about focus and behaviour during gameplay. Digital games, especially those available online, may be distracting due to the temptation of social media, messaging, or other non-educational content easily accessible within the same platform. This potential for distraction may undermine the educational value of digital GBL experiences. Furthermore, digital GBL raises concerns about screen time and its impact on students' health and well-being. Excessive screen time has been associated with disrupted sleep patterns (Hisler et al., 2020), lowered self-esteem, reduced learning speed, and heightened occurrence of mental health issues (Neophytou et al., 2021).

4. Merging the advantages of digital and non-digital approaches

The digitalisation of tabletop games offers a unique opportunity to merge the advantages of both digital and non-digital game-based learning, providing educators and students with a diverse and flexible learning experience. By transitioning from tabletop to digital versions of games, students can familiarise themselves with the game mechanics and rules in a classroom environment, leaving room for collaborative learning and face-to-face interactions. Subsequently, accessing the online version of the game allows students to engage individually, at their own pace and convenience, aligning with the time constraints of busy curriculums. The transition between in-person and digital gameplay not only maximises accessibility but also promotes continuity in learning, ensuring that students can reinforce their understanding of concepts beyond the confines of the classroom.

The digital version of tabletop games provides educators with easy data collection methods, enabling the accumulation of large quantities of data on student performance and engagement, thereby facilitating informed decision-making and personalised instruction. At the same time, in-person gaming sessions offer opportunities to identify the roots of certain common mistakes, allowing educators to address misconceptions and provide targeted support where it is needed.

As an example of this transition, the tabletop didactic game LimStorm (Szilágyi & Körei, 2021), based on the popular card game SOLO, recently underwent digitalisation. The game, which has the topic of limits in its didactic focus, has proven to be very popular with students in both formats, suggesting that following the path of digitalisation may hold promise for other non-digital GBL tools as well.

5. Presentation of the game Blue Yeti

Blue Yeti is a tabletop didactic card game designed with the objective of helping students understand the direct comparison test of improper integrals. In the gameplay of Blue Yeti, players interact with a deck of 29 cards, each representing a specific improper integral, except for the designated Blue Yeti card *(Figure 1)*. The primary objective of the game is to pair integral cards using the direct comparison test.

Figure 1. *Cards from the deck of the game Blue Yeti*

5.1. The didactic focus of the game

The notion of improper integrals arises when the limits of integration extend to infinity or when the integrand has discontinuities within the interval of integration. The definition of an improper integral involves evaluating the limit of a proper integral as one or both of its bounds approach infinity or a point of discontinuity. Students pursuing higher education encounter improper integrals across various disciplines, including physics, engineering, probability, statistics, finance, and economics. Mastery of this topic is crucial for understanding and solving complex problems in these fields.

The direct comparison test is among the tools available for analysing improper integrals. This test provides a method for determining the convergence or divergence of an improper integral by comparing it to another integral known to converge or diverge. However, the effective application of the direct comparison test requires both experience and intuition. Students must first estimate the convergence properties of the integral in question and decide whether to search for a convergent majorant or a divergent minorant to establish a comparison. Through practice and application, students can gain proficiency in using the direct comparison test to tackle challenging integration problems.

5.2. The rules of the game

The rules of Blue Yeti draw inspiration from another card game named Old Maid. At the beginning of the game, the deck of 29 cards is distributed as evenly as possible among the participants. In each round, players take turns drawing cards from each other's hands and trying to identify pairs of improper integrals among the cards they collect. A valid pair comprises a convergent improper integral and its convergent majorant, or a divergent improper integral and its divergent minorant. Pairs discovered by the players are placed face-up on the table. The first player to successfully discard all their cards becomes the winner. On the contrary, the participant left holding the Blue Yeti, which cannot be paired with any other card, is declared the loser of the game.

5.3. A gameplay session proposition

When employing Blue Yeti as an educational tool within a classroom environment, it is recommended to begin with a brief review of the coursework concerning improper integrals. For players who are new to the game or less experienced with improper integrals, a systematic approach of identifying each potential pair within the deck may prove beneficial. This includes distinguishing between the seven convergent and seven divergent pairs present in the deck. A colour-coded game mat *(Figure 2)* has been developed for a related game, YETI, which can be used in Blue Yeti as well, to further enrich the learning experience. This mat offers a visual aid for organising pairs of integrals, differentiating between convergent and divergent improper integrals, and clarifying the direction of the greater than – less than relations between the members of the pairs. By testing the game with the participation of first-year bachelor's students, we found that employing the presented structure for gameplay sessions, including the usage of the game mat, proved effective.

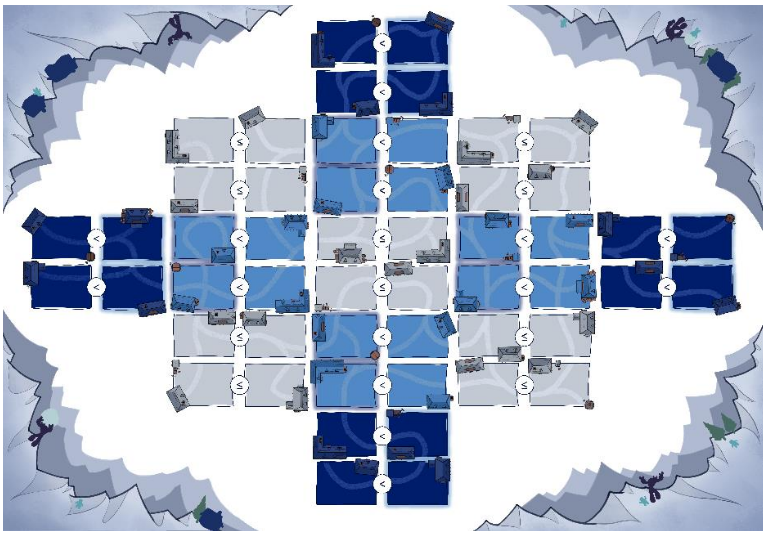

Figure 2. *The game mat designed for the game YETI*

5.4. Review of the challenges related to using Blue Yeti as a teaching aid

During the first testing phase of Blue Yeti in May 2023, involving 18 students in a 4-hour gameplay session, several challenges associated with the non-digital version of the game were identified. One significant concern was the limited availability of supervisors to verify pairings and assist players during gameplay. Another challenge observed was the scarcity of card decks available. As of the testing date, only three card decks had been produced, limiting the number of players who could participate simultaneously. With the proposed number of players ranging from 2 to 7 per game, the total capacity for concurrent gameplay was approximately 21 players. Therefore, numerous students who were interested in the gameplay session could not participate. This constraint of resources imposes limitations on the scalability of the non-digital version of Blue Yeti, restricting its accessibility to a wider audience.

The limited time frame in which non-digital games can be played in the classroom also poses a significant challenge, particularly in educational settings with packed schedules and busy curriculums. The demands of lectures and other academic commitments leave limited time windows for assisted gameplay, making it challenging to integrate Blue Yeti into the regular classroom routine effectively. Additionally, students' inability to play the game at their convenience, as part of their practice before midterms or exams, further constrains opportunities for engagement and skill development.

In response to these challenges, a decision has been made to digitalise the game, aiming to address the limitations of the tabletop version and enhance its accessibility, scalability, and flexibility.

6. The digitalisation of Blue Yeti

The digitalisation process of the game Blue Yeti is currently in progress, posing several interesting challenges to overcome when adapting its mechanics for digital platforms. The incorporation of both improper integrals and infinite series into the digitalised version of the game marks a significant expansion of the scope and educational potential of Blue Yeti. These two topics are interconnected through the integral test, which provides a powerful tool for determining the convergence property of infinite series by establishing a direct link between the convergence of an infinite sum and the convergence of its corresponding improper integral.

In the online iteration of Blue Yeti, players are offered the opportunity to tailor their gameplay experience by selecting either infinite sums or improper integrals to be featured in the game deck. Despite this choice, the rules and mechanisms of the game remain consistent, thanks to the strong similarities between the direct comparison tests associated with integrals and sums. Whether players opt to explore the topic of improper integrals or infinite series, they will encounter a cohesive gameplay experience.

6.1. Tools and technologies

In the planning phase of the digitalisation process, a decision was made to transform Blue Yeti into a web application, a choice driven by the numerous advantages online games offer over downloadable software. By opting for a web-based platform, Blue Yeti eliminates barriers to entry and provides a user-friendly experience for players. Unlike desktop applications that require users to download and install additional software, web-based games can be accessed directly from a web browser, providing instant access without the need for a lengthy installation process. Furthermore, the reduced storage requirements of web-based games alleviate concerns about storage space on the user's device. Another strength of online games lies in their cross-platform compatibility, which guarantees that players can play them regardless of their device or operating system. Additionally, the web-based nature of games facilitates the release of updates and patches, as changes can be deployed directly to the server without requiring users to download or install updates manually. Overall, the decision to transform Blue Yeti into a web application considerably improves the accessibility and usability of the game.

The programming language employed for the development of Blue Yeti is Typescript, a superset of EcmaScript 5, that transpiles to plain JavaScript (Bierman et al., 2014). Offering strong typing capabilities, Typescript provides developers with a more structured approach to web development. Its static type checking, module system, classes, and interfaces contribute to improved code maintainability and reliability, making it an ideal choice for building complex applications. Node.js, paired with the Express web framework, serves as the backend runtime environment for Blue Yeti. Node.js is a free, open-source, cross-platform server environment and library. It essentially functions as a JavaScript framework, renowned for its asynchronous and event-driven nature (Node.js). This architecture ensures efficient handling of requests, as the backend server processes events from an event queue without ever waiting for data, making it exceptionally suited for real-time web applications. Express complements Node.js by offering a lightweight and adaptable routing framework with a minimalistic core that can be extended using Express middleware modules (Express). The frontend of Blue Yeti is built using Angular, which has a component-based architecture, facilitating the development of scalable and maintainable frontend codebases. Additionally, Blue Yeti relies on a MySQL database to store the improper integrals and infinite series featured in the game, along with their possible pairings.

To replicate the fast-paced interaction of card games involving multiple players, Socket.IO is used in the Blue Yeti application for broadcasting player moves and facilitating real-time communication between clients and the server. Socket.IO is a JavaScript library for bidirectional, low-latency communication between web clients and servers (Socket.IO), making it ideal for implementing real-time features such as chat, notifications, and multiplayer gaming. It prioritises WebSocket connections but falls back to HTTP long-polling if the socket connection cannot be established due to the capabilities of the browser or the network.

6.2. Challenges encountered during the digitalisation process

The digitalisation process of Blue Yeti presents a series of challenges, which can be categorised into three distinct areas: challenges related to the understanding of the course materials, issues concerning the overall enjoyability of the game, and difficulties in translating the game logic to a digital format.

6.2.1. Challenges related to the understanding of the didactic content

Didactic games aim to improve students' understanding of course materials. Their usage is typically facilitated by direct supervision and guidance from teachers in a classroom environment. Before gameplay begins, teachers often provide explanations and examples that illustrate the didactic content, aiding players in recalling definitions and problem-solving methods related to a given topic. If deemed necessary, beginners can participate in practice games with open cards, enabling them to observe each other's hands, to learn from their fellow players' strategies and mistakes. Students with a better understanding of a concept can support their peers by offering helpful remarks and observations, ensuring that even those who may not fully comprehend the course materials at the beginning of the game can benefit from the gameplay experience.

However, this supportive environment is not readily available when using online games for at-home practice. In such scenarios, students may encounter challenges in understanding certain aspects of the given topic, with limited sources for consultation beyond their notes and the Internet. The abundance of information online can sometimes be overwhelming, leaving students without clear answers to their questions. To address this, it is crucial to incorporate concise explanations into the online version of Blue Yeti, covering topics such as infinite series, improper integrals, comparison tests, and convergence rules for various types of series and integrals (e. g. the rules stating the conditions for the convergence of geometric or hyperharmonic series).

To mitigate these challenges, diverse help menus are integrated into different parts of the game. A dedicated page within the application, accessible from the main menu, details Blue Yeti's gameplay mechanics. Additionally, a question mark icon embedded in the interface provides access to modal windows explaining the usage of the comparison test. The backend database specifies the broad type of each stored improper integral and infinite sum (geometric, hyperharmonic, etc.), allowing for the implementation of an assisted game mode. In this mode, users will be able to access specific convergence rules, applicable to a given infinite sum or improper integral, by clicking on the card containing the sum or integral in question. Moreover, in assisted mode, the number of pairs that can be found in a player's hand will be displayed, helping participants recognise when to focus on making pairing decisions. To create the most user-friendly layout possible, the integration of the assisted functionality will be the final stage of the development process.

Another feature introduced to enhance players' understanding of the game's didactic content is a *Practice* minigame. In this game, players must guess the convergence property of given infinite series or improper integrals, with correct guesses earning points and incorrect guesses prompting brief explanations of direct comparison test use-cases. The minigame serves a dual purpose: it can introduce possible card pairings before gameplay and test students' development and general understanding of the topic afterwards. In the future, it will also assist teachers by serving as a tool for quick, automated testing and data collection to pinpoint participants' strengths and weaknesses.

To reinforce the didactic content of the game, a simple colour-coding system has been implemented to distinguish between convergence and divergence. Throughout the application, convergence is denoted by a deep blue shade, while divergence is represented by a lighter blue tone. This consistent colour scheme aids players in knowledge retention by providing visual cues. In the *Practice* minigame, this colour system is used when the convergence property of an infinite sum or improper integral is revealed (***Figure 3***), while in the main game, the two distinct pairing spaces are colour-coded based on the convergence property of the pairs they can hold.

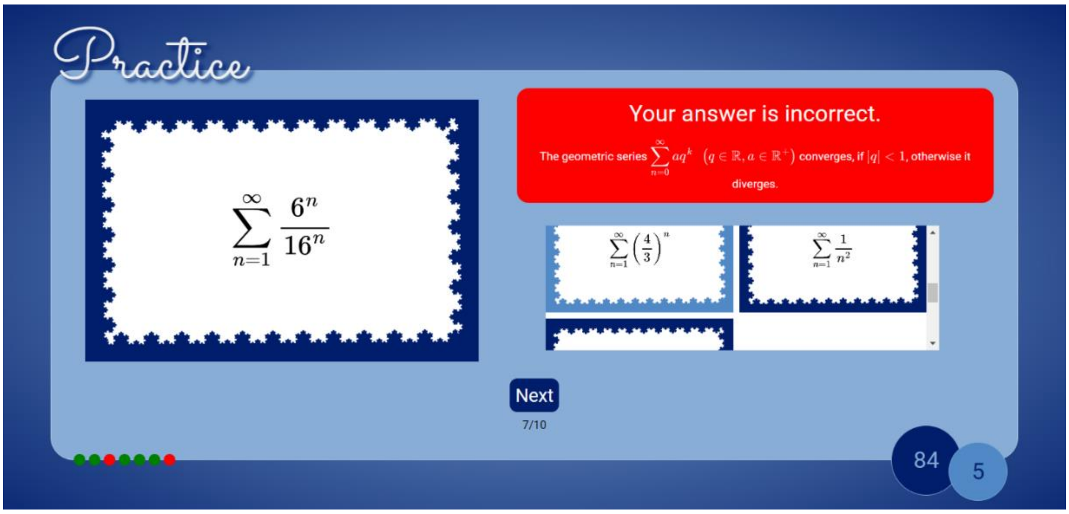

Figure 3. *The Practice minigame with detailed feedback*

From a didactic perspective, the ability for students to recall and revisit recently solved problems is crucial. Recognising this necessity, both the *Practice* minigame and Blue Yeti itself incorporate history tracking features. In the *Practice* game, this functionality is manifested through a scrollable panel showcasing all previously encountered series or integrals within a given minigame. Each entry is marked by a border colour corresponding to its convergence property. Similarly, in Blue Yeti, a collapsible sidebar displays all pairs that have been placed down throughout the course of a game *(Figure 4)*, providing students with more time to analyse and understand the pairing decisions made by their peers.

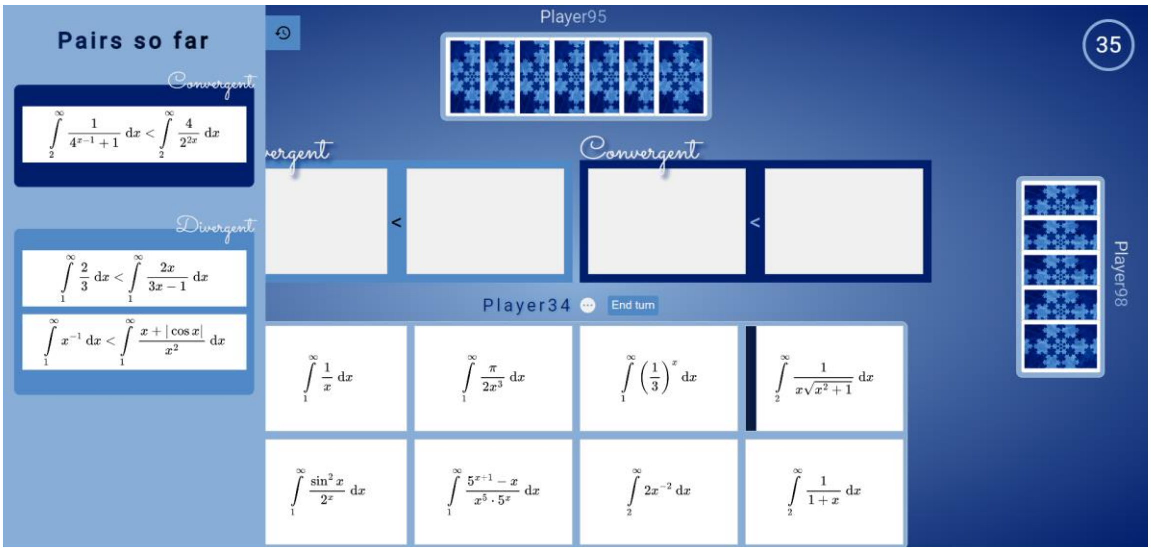

Figure 4. *The history sidebar in Blue Yeti*

6.2.2. Challenges related to sustaining the game's entertainment value

Challenges related to the enjoyability of the game emerge when transitioning from physical board games to digital versions. The social interaction element, integral to didactic board games, is more difficult to maintain in a digital setting. One potential solution is to introduce in-game reactions in multiplayer setups, which allow players to respond to each other's actions. While implementing a chat feature is another option, it risks cluttering the webpages and diverting attention from the ongoing game. On the other hand, incorporating timed rounds with only one active player at a time may cause boredom, which can be avoided by allowing participants to chat while the timers reach zero. As timed rounds are regarded as a general feature in online card games, and will be present in Blue Yeti as well, a chat functionality may be added to the game at a later date.

Enabling players to establish their own in-game rooms, restricting access to those in possession of a specific passcode, is another approach to reintroducing the social interaction element into the online gaming experience. Within these rooms, players can engage in games together and even customise round timers to their preferences. In this scenario, the students who play together know who their opponents are and therefore can establish group calls on external platforms, facilitating interactions during the game.

6.2.3. Challenges related to the translation of the game logic to a digital environment

When tabletop games are digitalised, challenges arise regarding the translation of the game logic, which can lead to inevitable restrictions to the game rules. For instance, in the digital version of Blue Yeti, a fixed player count of 4 had to be enforced to facilitate layout design and the development of certain key functionalities *(Figure 5)*.

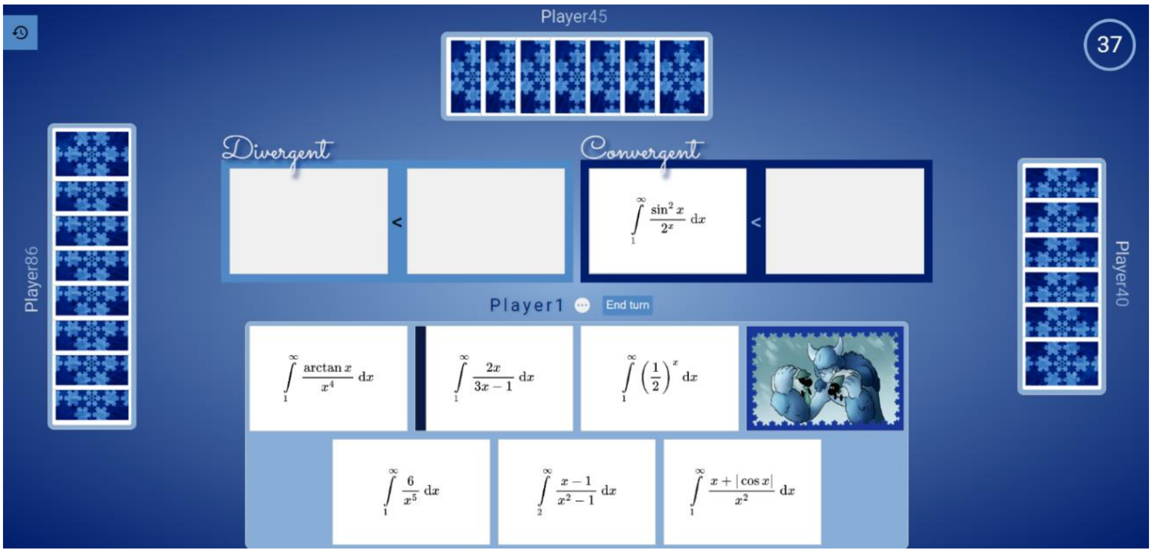

Figure 5. *Basic layout for the online version of Blue Yeti*

Online card games can often be too rigid, limiting users' ability to manipulate the cards in their hands. However, this flexibility is crucial in didactic games, where players may consciously organise their hands to aid categorisation techniques. For instance, they may differentiate between divergent and convergent sums or integrals by separating them, placing them at two different ends of their row of cards. Players can also place potential pairs they identify adjacent to each other for easy recall by the time their turn arrives. This customisable approach allows players to adapt their strategy to their individual needs and facilitates more effective intuition-building. Thus, in the digital version of Blue Yeti, players can rearrange their cards using a straightforward drag-and-drop feature.

During an in-person gaming session, other players can prompt slower participants to speed up their turns, but in an online setting, this is not possible. Hence, timers are commonly employed in digital card games to regulate turn times. If players fail to make a move within their allocated time, their turn is either skipped, or the computer executes a random move on their behalf to maintain the game's flow. Due to the particularities of Blue Yeti's gameplay mechanics, two separate timers are required in the game, as each round consists of two distinct phases. During the drawing phase, participants select a card from the hand of the next player in line, a relatively simple task that warrants a timer ranging between 10-15 seconds. This phase concludes when a player successfully retrieves a card from their opponent's hand. However, if no card is chosen by the end of the drawing period, the computer intervenes by making a random selection. This prevents players from exploiting the situation to their advantage, as skipping a turn would otherwise reduce the number of cards they hold, helping them win the game. Following the drawing period, the pairing phase begins, allowing the current player to put down valid pairs of cards.

This stage typically requires more time, as it involves the application of the direct comparison test, the main challenge of the game. Therefore, for the pairing phase, a timer of approximately 45-50 seconds is deemed suitable. Nevertheless, all participants have the option to end their turn earlier, if they complete their actions before the timer reaches zero, by clicking a button. If no valid move is executed before the countdown ends, the player's turn is terminated automatically without any further repercussions. The integration of timers sets a maximum duration of 4 minutes for each round. This time constraint helps players maintain their focus throughout the game while providing enough time to analyse their cards and make pairing decisions, whether during their own turn or while awaiting their opponents' moves.

Another factor to consider in the digitalisation process of Blue Yeti was the management of student mistakes and faulty pairings. In face-to-face gaming sessions, students are discouraged from making up random pairings in an attempt to exhaust all their possibilities, due to social pressure and the presence of supervisors. However, in the online version of Blue Yeti, some players may resort to testing out every possible pair of cards, viewing this strategy as convenient and effortless. To address this, penalties for poor decisions are necessary in the online version of the game. One approach is to end a student's turn automatically as soon as they form an incorrect pair, or more sensibly, after their second or third consecutive faulty pairing. Besides this, an additional layer of consequence is introduced in Blue Yeti: players who make incorrect pairing decisions not only have their turn ended, but also risk having one of their cards stolen by other players, who can exchange one of their own cards for those involved in the faulty pair. This mechanic ensures accountability in the game, as it allows the student holding the Blue Yeti, the guaranteed losing card, to transfer it to the player who made the pairing mistake.

7. Conclusion

The digitalisation of didactic games represents a necessary evolution, driven by the increasing demand for versatile learning tools that accommodate both individual practice and classroom environments. While tabletop game resources offer valuable educational benefits, their limited availability poses a challenge in meeting the diverse needs of learners. However, the transition to digital platforms requires careful consideration, acknowledging the fundamental differences between in-person and online environments. Adaptations must be made to align with the unique characteristics of digital learning, ensuring that the essence of the game remains intact while optimising its effectiveness in the digital domain. It is essential to recognise that the transformation of a tabletop game to a digital format necessitates more than a mere replication of game rules: it entails a thoughtful reimagining to suit the context of digital use. While core mechanics may remain consistent, adjustments are required to enhance user engagement, facilitate player interaction, and maximise learning outcomes within an online setting. Consequently, the digital version of a didactic game may diverge from its tabletop counterpart.

The digitalised game, Blue Yeti, serves as a prime example of this adaptive process, offering valuable insights into the intersection of digital and non-digital learning methodologies. As a versatile tool accessible in both tabletop and digital formats, Blue Yeti presents an opportunity for future research to explore and compare the effectiveness of digital and non-digital learning approaches, paving the way for more informed pedagogical practices and educational interventions.

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