

Serious Games, Conceptual Blending, and Creative Learning

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Article Info	Abstract
<p>Original Article</p> <p>Main Object: Education; Social Sciences</p> <p>Received: 23 October 2024 Revised: 06 November 2024 Accepted: 27 December 2024 Published online: 01 January 2025</p> <p>Keywords: blended learning, conceptual blending, creative learning, serious games, third space.</p>	<p>Background: Many efforts have been put into using serious games for education over the past two decades. Although there are different definitions for serious games, there is a relative agreement that the education of knowledge or skills through or by means of entertainment is at the heart of every serious game. However, educational capacities of serious games and learning strategies exploited in them require further studies.</p> <p>Aims: Considering the capacities of Fauconnier and Turner's Blending theory, this paper aims to show that the learning strategies in serious games can have other dimensions.</p> <p>Methodology: This paper employs a conceptual and theoretical analysis methodology, drawing on Fauconnier and Turner's Conceptual Blending Theory to examine the learning strategies embedded in serious games. Additionally, it utilizes a case study approach, analyzing the serious game FLIGBY to illustrate how structural and conceptual blending contribute to creative learning.</p> <p>Findings: The focus point of the paper as the source of the generation of different kinds of unconscious learning processes will be conceptual blending. In the end, the paper will also introduce the serious game FLIGBY from the perspective of Fauconnier and Turner's blending theory at both structural and conceptual levels.</p> <p>Conclusions: By means of blending theory, it will be discussed that the elevation of serious games to a higher level is possible; a level that will not only reduce the tiredness of serious games but also pursue a more innovative learning, happening at two levels of structural and conceptual.</p>

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1. Introduction

Different strategies have been adopted in order to gain the most creative usage of video/computer games in learning processes in the past two decades. These strategies have resulted in the production of games whose main goal is the development of learning in its general meaning or formal education at different levels. These games that are called edutainment games, serious games, and the like, make use of games in order to reinforce learning and education. Many studies have considered these functions. Gee (2003), in his famous book, recounts 31 functions of games for education. Kowsari and Garousi (2018) also in reviewing 100 online games show how simple online card and board games help the expansion of 30 mental skills of players (such as problem solving ability, leadership and control, crisis management, deductive reasoning, thinking differently, concentration, modeling ability, and creativity). Many people, from different ages, find education in its conventional method boring and disappointing. Therefore, one of the main goals of edutainment games is the removal of this disappointment and frustration with the help of the combination of learning and game together.

Serious games fundamentally follow the same end and although several definitions have been presented for serious games, the main goal of all these games is to make the learning processes, for example the learning of a craft or civil behaviors, a pleasing experience (Mouaheb et al., 2012). However, there is disagreement on the place of entertainment in serious games. For example, Zyda (2005: 4), in his formal definition, knows entertainment an essential factor of serious games: "Serious game is a mental contest, played with a computer in accordance with specific rules, that uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives."

Another point that should be paid attention to is the role of learning theories in the study of serious games. Wilkinson (2016) states that the majority of educational Serious Games do not explicitly adopt a key learning theory. However, Mouaheb et al. (2012) show that learning through serious games has educational values that are based on learning concepts advocated by constructivist psycho-cognitive theories, and that it guarantees intrinsic motivation, generates cognitive conflicts, and provides situated learning.

Susi et al. (2015) correctly claim that there is no current single definition of the concept of serious games, but emphasize that serious games usually refer to games used for training, advertising, simulation, or education that are designed to run on personal computers or video game consoles. According to them, the concept of serious games was first considered after the release of America's Army and it was exactly at that time that the web site seriousgames.org was launched.

The answer to this question that why today the need for the

gamification of learning is necessary could be useful in philosophical, sociological, and pedagogical terms, however, it needs another study. Useful information in this respect could be found in Lee and Hammer (2011), and Hamari et al. (2014). Anyway, whether in edutainment games or serious games, a kind of blending occurs, and the number of researches that have studied this blending is increasing including Hoshi et al. (2011), Tüzün (2007) and Holbert et al. (2014). It should be paid attention that blending is not simply limited to the structure of the games; for example, the new methods of learning mathematics or a new language through playing, but it could be also used in order to reach a higher level of learning and education. The main goal of this study is the investigation of conceptual blending as a key strategy for the development of the capacity of games in order to improve learning in its most extensive meaning.

2. Methodology

The methodology of this paper is primarily conceptual and theoretical analysis, focusing on the application of Fauconnier and Turner's Conceptual Blending Theory to serious games and their role in creative learning. The study does not rely on empirical research methods such as experiments or surveys; instead, it engages in an extensive literature review of existing theories on serious games, learning strategies, and cognitive processes. By synthesizing insights from various scholars and theoretical frameworks, the paper aims to establish a deeper understanding of how serious games can facilitate both structural and conceptual blending in the learning process.

Furthermore, the paper employs a case study approach, using the serious game FLIGBY as an illustrative example. Through a detailed examination of FLIGBY's design, mechanics, and learning objectives, the authors assess whether the game successfully integrates both structural and conceptual blending. This analysis is conducted through a critical lens, drawing comparisons between FLIGBY's pedagogical approach and the principles of conceptual blending. The study also considers the broader implications of these findings for the development of serious games, emphasizing the need for innovative learning methods that extend beyond traditional gamified education.

3. Discussion

3.1. Conceptual blending theory

Fauconnier's third space theory which is better known as conceptual blending theory is a relatively simple but very important theory with a lot of usages. For Fauconnier and Turner, human is the only creature that has mind and mind is something different from, but completely relative to, the brain (Fauconnier & Turner, 1988; Turner, 1993).

Mind is nothing but mental/conceptual projections, and projections are themselves produced from conceptual blending. When we connect

two concepts together, a third concept is produced from their blending. Fauconnier and Turner (1988) call this third concept the third space. In another word, it can be said that in this approach mind is nothing but mental spaces or mental projections that are themselves clusters or combinations of mental spaces. According to Turner (1996; 2014), the main difference between the human race and other similar animals is exactly this conceptual blending. Animals also learn things, but they cannot extend their learning. What helps the extension of human learning is the extension of cognitive maps, which in turn are the result of conceptual blending. Therefore, animals' learning remains at initial levels, because they cannot attain the higher levels of the extension of mental/cognitive maps through conceptual blending (Turner, 1996; 2014; Bhabha, 1994).

According to Fauconnier and Turner (1988) the human growth in all aspects of science, technology, art, and even everyday life is dependent on the blending of concepts together and attaining newer mental spaces. According to Turner, a concept like an "empty set" which was unimaginable at first, was created from the blending of two concepts of "set" and "emptiness". In every conceptual blending in which a third conceptual space is created from two separate conceptual spaces, three elements are needed: a generic space, a first space (first input), and a second space (second input). From the blending of the first and second spaces as inputs, in accordance with a generic space, a third space is created.

According to Turner (1996), metaphors, having a key role not only in literature but also in everyday life, are the product of this conceptual blending process. He clearly observes that creativity is basically the ability of conceptual blending and the main difference between major scientists, inventors, and artists and other people goes to their difference in this ability.

3.2. Blended learning

In the recent years, several articles have been written on the subject of blended learning. According to these definitions, blended learning is a combination of traditional, modern, real, and virtual methods in a planned and pedagogically valuable manner. A simplified definition for blended learning is the employment of a combination of educational platforms, including traditional and internet platforms. Although different models for blended learning have been proposed by scientists, most of them have not get close to the true concept of conceptual blending. Most of these models turn around the blending of educational methods or platforms, and are distant from the main meaning of the conceptual blending theory. This applies even to the third space concept. Hundreds of articles have been written on the importance of the third space in education, however, in most of them the third space is simply a space between school and home and their main concern is

how to construct an in-between space to help to have a better learning and education. Most of these articles, whether borrowing this concept from Fauconnier and Turner (1988) or from Bhabha (1994) and Soja (1996), have distanced from the main concept of the third space. As far as related to the theory of Fauconnier and Turner (1988), blended learning is even possible in traditional education systems. The capacities of Fauconnier and Turner's theory is much more than what the third space researchers in the education field have conceived. On the basis of this theory, new methods for creative learning could be found, what is lacked in many traditional and virtual educational systems. What is known as Socratic method is perhaps the closest to the spirit of Fauconnier and Turner's theory. Plato has used this method appropriately in his dialectics. Undoubtedly, parts of Plato's method have been transferred in the form of "problem solving" methods to the education, but Fauconnier and Turner's theory is perhaps one of the best educational methods close to Plato's (Wilkinson, 2016). For Plato as a teacher of philosophy, it is not reasoning that is important, but the way of reaching it. In this method, he teaches us abstraction, analogy, and the way of reasoning. Plato's method is very similar to what Fauconnier and Turner try to tell us about the formation of the third space or mental space. However, unfortunately, as far as the authors of the article know, the capacities of Fauconnier and Turner's theory have not been employed appropriately and sufficiently in pedagogical theories.

3.3. Serious games and Creative learning

Without doubt, serious games have provided new capacities for learning, giving the learners the opportunity to learn new things, depending on their needs, in an interesting space and together with entertainment. Serious games have been used not only for the education of science and technology, but also for the education of everyday issues. Serious games have the capacity to design new methods of learning inspired by Fauconnier and Turner's theory (1988). It could be said that seriousness no more refers only to the content of the game (seriousness against entertainment and recreation) but more than anything to the learning method. Therefore, the main element in the design of serious games is not the content, but the design of the game thereby the content being represented to the player. From a critical vantage point, it is not impossible to have serious games with even profitable or hegemonic goals. According to Apperley (2006), games are a way for calling subjects in their Althusserian meaning. Serious games can be a way for the adaptation of us to the customary methods of living and it is exactly what should be suspected and looked at seriously.

3.4. Positive psychology

Investigating such issues as creativity and happiness are subjects of a relatively new subfield of psychology, "positive psychology", one of

whose founding fathers being Csikszentmihalyi. Positive psychology is a branch of the discipline that relies on scientific understanding and effective intervention to aid in the achievement of a good and socially productive life (Buzady, 2017).

Gamification has been one of the most common ways of creating creativity and happiness simultaneously, since very long times ago. What is more important, as McGonigal (2011) emphasizes repeatedly, is that the achievement of success does not necessarily lead to satisfaction per se; rather, it is the hope of achieving the goal that is enjoyable. This explains why gamers often perceive stronger positive emotions when they fail rather than succeed (Ji, 2014). This is exactly what serious games look for.

According to their purposes, games could be divided into simulation games, training exercises, and edutainment games. As shown in Figure 1, simulation games (for example car racing video games) are a hybrid of “game” and “simulation” elements; training exercises (such as cockpit simulation) combine “simulations” with “learning” contents; and finally edutainment applications (such as preschool spelling and reading games) combine “learning” content with “game” features. Serious games feature all of these three aspects simultaneously: some theory (learning), use of technology (simulation) and fun-element (game), representing a new and growing interdisciplinary industry segment (Almeida & Buzády, 2019).

3.4.1. Training exercises

According to Figure 1, training exercises are the result of the blending of “learning” and “simulation”. In fact they are simulations that are used for serious training purposes instead of fun or entertainment. The oldest and best known examples of them are cockpit or flight simulations. In these simulators the flight situation and/or cockpit environment are recreated as much as possible similar to the real ones, so that the pilot under training feels he/she is in a real cockpit experiencing a real flight. The main benefit of such simulations is in high-cost and high-risk activities like flight in which small flaws during the training processes will have uncompensable consequences, damages, or costs. The form of simulation that is dealt with here involves the combination of science, technology, and art to create an artificial realism for the purpose of research, training, and pleasure (Rolfe & Staples, 1988).

3.4.2. Edutainment games

Edutainment games are the result of the blending of two fields of education and entertainment (as shown in Figure 1, a combination of “learning” and “games”). The most evident difference between edutainment games and simulation games is that player’s first priority in the former is playing and entertainment while his/her first priority in the latter is learning. Edutainment games in general increase the social

and cultural literacy of society members through the exploitation of the new media (Egenfeldt-Nielsen, 2011).

3.4.3. Simulation games

A common feature of all simulations is that they attempt to provide an operating imitation of a real activity (Rolfe & Staples, 1988). In simulation games, this is done in the medium of games with the goal of making serious situations more enjoyable experiences for unprofessional users. According to Thiagarajan and Stolovitch a simulation game is a contrived activity which corresponds to some aspect of reality. The activity involves players who strive to resolve one or more conflict(s) within the constraints of the rules of the game. It comes to a definite closure with the determination of winners and losers (Thiagarajan & Stolovitch, 1978: 7-8). Most of driving, shooting, strategic, and competitive games are examples of these entertaining simulations. They persuade the player to play the role of imaginative persons in simulated situations for the purpose of fun and entertainment, therefore they are the result of the blinding of “simulation” and “gaming”.

3.4.4. Serious games

According to Abt (1987: 11-12), serious games unite the seriousness of thought and problems that require it with the experimental and emotional freedom of active play. Serious games combine the analytic and questioning concentration of the scientific viewpoint with the intuitive freedom and rewards of imaginative, artistic acts. Michael and Chen (2006) define a serious game as a game that does not have entertainment, enjoyment, or fun as its primary purpose, but according to Dörner et al. (2016: 11), a serious game is a game created with the intention to entertain and to achieve at least one additional goal including learning or health etc.

However, according to our triadic division of games (Figure 1), serious games are at the first level the result of the blending of “training games”, “edutainment games”, and “simulation games” and at the second level the result of the blending of “learning”, “simulation”, and “gaming”. Therefore, serious games are the result of some double blending: the blending of games that are themselves the result of some other blending processes.

3.5. Flow

One of the significant results of the blending of “learning”, “simulation”, and “gamification” is the production of the state “flow” in the processes of learning. Flow is a property that can be attained through not linear but complex situations. The very result of complexity of the situation is the feeling of immersion.

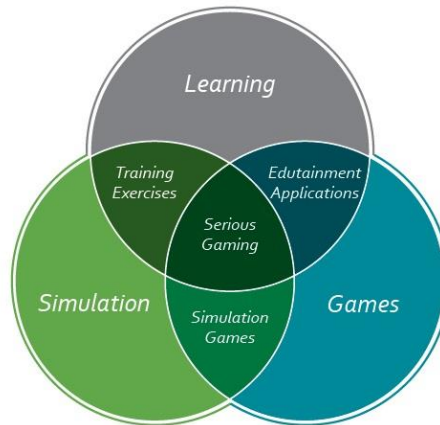


Figure 1. Serious gaming at the intersection of learning, simulation and games (Buzady, 2018)

In fact, the feelings of flow and immersion are themselves complex feelings that are the result of the combination of simpler basic feelings. Just similar to the notion of immersion in Buddhism, which is achieved as the fruit of simultaneous mastery in several mental abilities. It is more like a complex multi-faceted feeling achieved through the unity of other feelings than a simple linear feeling.

According to Buzady (2017), flow is a mental state in which a person performing an activity is fully immersed in a feeling of energized focus, full involvement and enjoyment. It is an intrinsically rewarding experience and it can also help one achieve a goal or improve skills. Flow tends to occur when a person's skills are fully involved in overcoming a challenge that is just about manageable. In flow self-consciousness disappears, yet one feels stronger than usual. The sense of time is distorted— hours seem to pass by in minutes (flowleadership.org). This common experience of feeling a deep sense of enjoyment has been given the name flow, because respondents often made the analogy to be moving effortlessly in a current of energy where action and awareness follow each other spontaneously and freely as being “carried by a river or a stream” (Almeida & Buzády, 2019) .

3.6. Leadership

One of the areas in which the usage of serious games is of high importance and significance, is management and leadership. Management is, in fact, a complex skill composed of the simultaneous combination of different skills and properties. In order to be a good manager you should immerse yourself in a variety of skills and situations to be able to make the best decisions among a vast variety of possible decisions and conditions. In reverse, in order to teach

management, the ability of flow and immersion should be evaluated or improved, one of the most efficient ways for it being serious games. Therefore, one of the common concepts between modern leadership and game theory is the concept of flow. Mihaly Csikszentmihalyi has recently expanded this concept in the form of "flow theory" that has become a globally known and used concept in many disciplines of science and practice, ranging from sports, music, pedagogy over management science to leadership and decision making science (Buzady, 2018).

The other joint point between games and leadership is the necessity of simulation. An acceptable leadership is always based on a combination of theoretical science and field experiences. This is why simulation is of high importance in this field, because it can play the role of field experiences and save time and practical cost and effort. Needless to say that the wrong decisions in the real world, especially at large scales, can result in uncompensable consequences.

Leadership simulations or leadership serious games are programs and applications representing a sequential decision-making exercise structure around a model of a business operation, in which participants assume the role of managing the simulated operation. Leadership Simulations put the learner in the role of a problem solver responding to realistic workplace problems or situations.

One of the biggest differences between leadership simulations and other simulation programs is that leadership simulations are more scenario-based and revolve more around mental than physical behaviors. Key factors in leadership are human forces and social and economic factors, while key factors in most of other simulations are physical and environmental factors and situations (flowleadership.org).

3.7. Structural and conceptual blending in serious games

Blending in serious games can have two different levels: structural and conceptual. Structural blending does not go beyond the predictable structures of the game. At this level, the result of the blending of three linear phenomena of "learning", "simulation", and "gaming" will be a complex game that provides a multi-faceted experience that as said is known as flow or immersion. In these non-linear games the goals of the game are presented in a non-linear way, trying to submerge the player in the flow of the game as much as possible. It is a good property of blending, but is not the end of the story.

The deeper parallel level at which blending shows off is the conceptual level. This phenomenon like most of other conceptual phenomena happens more unconsciously. That is, the player of the game will not notice its results directly or instantly. It is not felt directly by the player's consciousness or through sensing, but will appear in the player's way of thinking and through intuition.

Player's more conscious improvements through structural blending

can include, for instance, crisis management, control, deductive reasoning, problem-solving skill, and decision making, while the more unconscious improvements revolve around complex mental concepts like creativity, viewpoint, insight, and attitude.

structural and conceptual blending are two sides of a same coin and they are both produced through the same multi-blending processes, however, the occurrence of the latter is more difficult, more indirect, and harder to evaluate, just as the phenomenon of creativity and aesthetics in art. All artworks enjoy a complex series of technical blending, but only a few of them are known as masterpieces, because only a few of them enjoy creative aesthetics. Aesthetics and creativity are very ambiguous concepts so that cannot have determined definitions, nonetheless they appear in specific situations and can be understood by others. They are a layer beyond the formal aspects of artworks that could not be related to any specific structural property of artworks.

Flow and immersion are very complex feelings that are not produced easily, however they are consciously sensed and felt. It is while the parallel conceptual level which is also the result of the same blending processes, though in a different dimension, produces some kind of subconscious cognition rather than different kinds of conscious bodily or mental skills.

A leadership serious game, for example, can reinforce the mental abilities and skills like management, risk management, multi-processing, and evaluation at the first layer of blending, but what is produced through the second level can be “a new vantage point on the concept of management”, “an understanding of the importance of management”, “a need for the application of the newest management methods”, “an encouragement or need to learn new things about management”, “a need to be a better manager”, “a deep and subconscious feeling of satisfaction and enjoyment from the job of management”, “a belief in the importance of having good behavior with employees”, and “an understanding of the fact that respecting the rivals is beneficial”.

Now, the question is which serious games address only the structural blending and which ones address both the structural and conceptual blendings. Naturally, as expected, the evaluation of subconscious elements is not that easy and requires special psychoanalytic and social tests, which promises further experimental studies in the future. This main division in serious games can have many benefits for the creation of games with different levels of direct and conscious or indirect and unconscious effectiveness. Therefore, serious games can be a crossroad between psychoanalysis, sociology, and learning and game studies and psychoanalysts and sociologists can have a fundamental role in the making processes of purposeful games in different arenas from politics to economy, education, and even advertising.

3.8. FLIGBY

FLIGBY is one of the well-known serious games in the area of leadership. It is an online game on the basis of flow-promotion in leadership, which is designed by Prof. Mihaly Csikszentmihalyi from Claremont University. FLIGBY, as an interactive digital game, is aimed at finding ways to best translate the concept of flow in business (learning) into a practical teaching tool (simulation) which also features motivating elements (game) (Almeida & Buzády, 2019). Thus, the aim of this game is to become a tool that makes the teaching and learning of flow-compatible leadership values and practices easy, funny and lastingly memorable (Buzady, 2017).

FLIGBY is a serious game with an interactive movie design. It offers the user a choice about which direction a given phase or level may proceed. The scenario-based approach used by FLIGBY is a proven method to improve critical thinking skills. The lessons are built around a series of progressively complex workplace assignments or situations. FLIGBY allows you to practice your responses to challenging business conditions whilst keeping you safe from the expensive (and sometimes irreversible) consequences of your decisions. It is the gamification of the flow-based leadership development process. The competitive advantage of using FLIGBY is that it maintains the respondents' motivation at a high level throughout the game—thus players enjoy what they are doing. This contributes greatly to the reliability and relevance of the results.

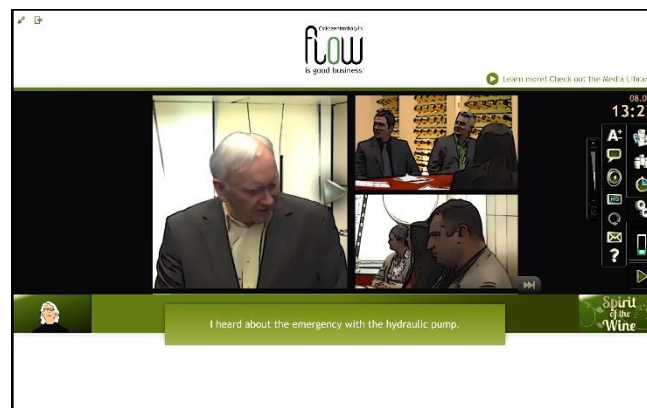


Figure 2. An image of the environment of FLIGBY (fligby.com)

In the story of the game, the leadership style of the former manager of Turul Winery has destroyed the spirit of the management team that used to be cohesive. You are the newly appointed manager, whose task as a player is to build a well-functioning team out of the poorly-motivated, mid-level managerial group. The aim is to try to bring as many colleagues as possible— even if just for a short time— into a flow

state, by making small and not-so-small decisions, with a view toward improving Turul Winery's key performance indicators. The simulation makes participants prove their worth as a leader, becoming GM of the fictional family-owned Winery. The goal is to make Turul Winery a performing business and a great place to work.

You are charged with leading a board made up of 8 pretty sophisticated individuals, each responsible for a function and each being a distinct, strong and interesting character, the types you surely have encountered in your professional life. Every organizational challenge will lead you to a decision. On most decisions you must choose one answer out of 3 to 5 options. Your selection will put you on your own individual path with consequences in your team's performance (fligby.com).

The player's overall performance as the GM of Turul Winery will be indicated by winning or not the Game's ultimate prize, the so-called Spirit-of-the-Wine-Award. And, the average game-time is 7-9 hours (Almeida & Buzády, 2019).

Also, the library of the game sometimes offers guides regarding the specific decision that is waiting to be made. The player can watch or read them or completely ignore them. These bonus educational tips somehow combine the indirect learning method with the direct one, but only on the basis of the player's preference. It is like when you might prefer to study or talk with someone when you are faced with a difficult decision. Decision of the player to learn additional things in difficult situations could be considered an effective optional way of learning. It itself could be considered another level of blending between subconscious and conscious learning.

One of the important properties of FLIGBY that plays a significant role in its being a serious game is its realistic video based format. In fact the environment and characters of this game are not digitally created ones, but are real ones. This property by blending the elements of the real world with made-up situations makes the simulation dimension of the game more realistic, so that, the smallest elements like the face, clothing, voice tone, look, and even the body language of the characters get meaningful for the player and increase the flow property of the game.

This game keeps track of your multi-dimensional achievement scores, which are available automatically during the game. The content and the decision structure of FLIGBY have been designed to test, measure and develop 29 leadership and management skills directly during the gameplay. As an output of the game-based people analytics, players are given detailed feedback on the current state of their skills in the form of a Personal Report (Buzady, 2018). Also, in the end, a detailed 42 pages Personal Report is built on the basis of those decisions, the Player has made throughout the game. In summary, FLIGBY, claimed by its creators, can help organizations build strategic

skills in a timely, cost-effective and focused manner (fligby.com).

However, the question is whether FLIGBY as one of the most famous examples of serious games enjoys a conceptual blending or it is limited to structural blending. Our personal experience of this game and the descriptions presented in the previous paragraphs, which are based on information available on the website of the game or the papers published by its owners and designers, provide a quick approximate vision of the game. The most important properties of FLIGBY like being based on realistic videos and real conversations between real people, mostly focus on the phenomena of flow and immersion which are the prerequisite of both structural and conceptual blending. However, the significant role of textual stuff in different places of the game and specially in its ending that is based on the presentation of textual statistics (loads of information about the analysis of the leadership behaviors and skills of the player) strongly signifies that the game turns more around conscious structural blending than conceptual blending. This kind of information presentation is even against the flow aspect of the game and generally understanding through texts is a conscious process that is far away from the unconscious flow of conceptual blending that was discussed. The other aspect that is not compatible with conceptual blending is the lack of diversity and innovation in the too realistic environment of the game. In other words, the environment is too realistic to give space to innovative unconscious blendings to constitute. When everything is exactly the same as the real life the flow stops at its basic level and does not lead further to the realm of innovation. Although we hope that this evident problem will be addressed in the next versions of the game, the accurate and reliable analysis of this game requires experimental and theoretical evaluations based on psychoanalytic, sociological, and learning theory elements and parameters, which we hope will be carried out in future studies.

4. Conclusion

Serious games are technically the result of the blending of other sets of blendings, which makes them complex non-linear entities. These games try to create the flow in which the gamer will be able to experience the feeling of immersion, where the gamer will step beyond the linear properties of the constituting elements of the game and experience complex concepts and situations. In the designing of serious games the structural level has often been paid attention to, which makes serious games a pleasing means for learning. Pleasurability of learning through games has attracted the attention of several educational scientists to this genre of games and has provided an appropriate market for designers and producers of the game industry. However, what should not be ignored is that exactly what are known as the pros of these games, like immersion, interaction, multi-narration, and simulation, can after a while become the boring factors of them. Therefore, the improvement

of serious games needs attention to the conceptual blending level. Conceptual blending elevates serious games to a more innovative level. At this level, the player not only learns the skills and knowledge presented by the designers of the game, but also, in an innovative manner, attempts a conceptual blending, thereby attaining a new experience in learning. What makes learning pleasurable is not merely its blending with game, but the main pleasure of learning experience is what can be called the discovery moment. Although enjoying an appropriate design at the structural level and providing an appropriate context for learning, the online game FLIGBY does not benefit from all capacities of conceptual blending. It is obvious that conceptual blending is not something to be transferred as a specific content to the player and is even one level above the structural blending. The best comparison is to the art. There might exist specific methods and strategies to create more pleasurable structures in art but there is no specific one to create more pleasurable concepts in art. Because, a conceptual level is generated in the brain of the audience through blending processes which often happen unconsciously. Unconscious concepts revolve around complex mental subjects like creativity and insight which are themselves ambiguous complex concepts in psychology, anthropology, and social sciences. This paper wanted to give a hint that learning is not limited to the transference of skills or knowledge, but it can also involve the preparation of contexts, situations, hints, and encouragements for blending and at a higher level conceptual blending and that it is only through this path that the specific signature of the learner/player will be carved on the learning experience and learning will become a pleasing experience, like what makes an artwork one of kind. We hope this subject will encourage artists, psychologists, social scientists, and game designers to work together to develop new road maps to make it easier to articulate such complex concepts in the very interesting area of serious games.

Conflict of interest

The authors declared no conflicts of interest.

Authors' contributions

All authors contributed to the original idea, study design.

Ethical considerations

The authors have completely considered ethical issues, including informed consent, plagiarism, data fabrication, misconduct, and/or falsification, double publication and/or redundancy, submission, etc. This article was not authored by artificial intelligence. A brief description of the idea of this paper was presented as a single-page poster at the International Serious Games Symposium (ISGS), December 21/22, 2023, Tehran, Iran.

Data availability

The dataset generated and analyzed during the current study is available from the corresponding author on reasonable request.

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