



Exploring the Link Between the Psychological Needs and the Elements of Game Design for Educational Games

Menerokai Perkaitan Antara Keperluan Psikologikal dan Elemen Reka Bentuk Permainan bagi Permainan Pendidikan

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Abstract

This article describe a study in exploring the link between play, an evolutionary and biological trait found in human behaviour and the fundamental human psychological needs; and its complex relationship with the game design principles in order to answer the following - why do people play games and what motivates them to do so? Answering these two questions would enable educational game designers to better understand game design principles for developing engaging educational games. This study delved into the psychological aspects of play and attempt to link those aspects to game design elements. Studying Prensky's six elements of successful games, the Octalysis gamification framework and the fundamental psychological needs, the article will then present the findings of an exploratory and confirmatory survey from practicing game designers all around South-East Asia. The results of these findings give an overall positive and current result that provides a useful point of reference in order to create a game design model that would offer a set of guiding principles for educational game designers to create engaging gameplay.

Keywords: game engagement, user experience, pre-production model, gamification, serious games.

Abstrak

Artikel ini menerangkan satu kajian dalam menerokai kaitan antara main, sifat evolusi dan biologi yang terdapat dalam tingkah laku manusia dan keperluan asas psikologi manusia; serta hubungannya yang kompleks dalam prinsip reka bentuk permainan bagi menjawab yang berikut - mengapa orang bermain permainan dan apa yang mendorong mereka untuk melakukannya? Dengan menjawab dua persoalan ini akan membolehkan pereka permainan pendidikan memahami prinsip reka bentuk permainan dengan lebih baik untuk membangunkan permainan pendidikan yang menarik. Kajian ini mengkaji aspek psikologi permainan dan cuba menghubungkan aspek tersebut dengan elemen reka bentuk permainan. Melalui kajian enam elemen Prensky terhadap permainan yang berjaya, satu kerangka gamifikasi Octalysis dan keperluan psikologi asas, artikel ini kemudiannya akan membentangkan penemuan tinjauan eksploratori dan pengesahan dari pereka permainan yang berlatih





di seluruh Asia Tenggara. Hasil penemuan ini secara keseluruhannya memberikan hasil positif dan terkini yang menjadi rujukan berguna untuk membangunkan satu model reka bentuk permainan yang akan menawarkan satu set prinsip panduan bagi pereka permainan pendidikan dalam penghasilan corak main yang menarik.

Kata Kunci: permainan menarik, pengalaman pengguna, model pra-produksi, gamifikasi, permainan serius.

INTRODUCTION

Over the course of the last few decades, humanity has seen an unparalleled rate of progress resulting in a rapid advancement of technology in practically every area possible. The modern society's dependence on digital technology has changed as a result of that and has shaped the way we communicate, conduct business and how we manage stress after a particularly long day at work or at school. As a result of growing up exposed to this ubiquitous digital environment, the current generation's minds have been indisputably rewired (Prensky, 2001) This is thanks principally to video games, possibly one of the most prevalent, lucrative, and significant forms of entertainment the world has ever seen.

The collective video games industry grew 3% to USD120.1 billion in 2019 and is expected to reach USD124.8 billion by the end of 2020 (Super Data, 2019). Most of the new generation, dubbed with various names ranging from 'digital natives' (Prensky, 2001) to the 'digital generation' (Taipale, 2016) are the inherent speakers of the digital language of computers, digital games, mobile and portable devices; and the internet of things. While there has been much dispute about the term and whether there exists an entire generation that can be considered a native speaker of the electronic world (Jones et al., 2011; Judd, 2018; Taipale, 2016), this research cannot ignore the fact that are indeed complex changes that are taking place in the younger generations that is in-line with the latest waves of technology.

One of these changes is how technology and video games has shaped our concept of play. Video games has an innate ability to engage players in a highly immersive entertainment bubble. The essence of any successful video games is play and according to psychologists (Zosh et al., 2017), play is nature's way of making learning engaging. It is this engagement that has sparked an interest in educational game research as many scholars believe that video games may be able to provide a formal, structured way to harness and unleash the concept of fun and play into systemic learning. It is important to understand the concept of play and why video games seem to revolutionize and alter the very notion in our approach to play.

THE PSYCHOLOGY OF PLAY

Play is exceedingly regarded as a universal characteristic in the evolutionary and biological human behaviour. In fact, it is so central to early development as it contributes to humanity's social, physical





and emotional well-being (Zosh et al., 2017). It is an evolutionary characteristic that is an inborn, socially centred facet, inherited through our ancestors to shape our experiences and behaviours. Play is a huge part of the human experience that has helped formed our society and culture which in turn, arguably has helped humanity's survival as a dominant species (Heick, 2017). However, it is only recently that sociologists and psychologists are beginning to unravel the mystery of why our capacity and desire to play is so powerful (Yogman et al., 2018). According to research, humans all have a basic psychological need that is perpetually operating in our lives (Vansteenkiste et al., 2020).

According to Abraham Maslow – each of us are motivated by needs. He developed the Hierarchy of Needs model (de Mézerville López, 2019), a theory in human motivation psychology which is detailed out within a five-tier pyramid model of human needs, in order to explain how these needs, motivate us. The model is represented through hierarchical levels within a pyramid-like structure with the bottom levels being the need to be satisfied before individuals can attend to the other needs at the higher levels. The bottom two levels deal with necessities like survival, physical and emotional well-being while the other three levels deal with influence, a sense of belonging, self-development, self-esteem and self-actualization. Maslow breaks down the esteem needs into two distinct categories – esteem for oneself which covers attributes like dignity, achievement and mastery; and the desire for reputation or to seek out respect which covers attributes like achieving status, independence and prestige.



Przybylski, Rigby and Ryan (2010) explains that these can be summarized down to three very fundamental psychological needs category; competence, autonomy and relatedness. We all feel the need to be competent or successful even, an innate desire to seek our control or mastery over a particular moment, skill, knowledge or situation. There is this perpetual desire to feel or achieve a sense of growth and accomplishment in our lives; whether it be at work or at play. This psychological need is termed as competence. The desire to feel a sense of independence and the sense of having a certain degree of control over our lives and actions is a psychological need termed as autonomy. This could be the reason why humans crave for freedom and why the loss of autonomy in the sense of imprisonment or slavery can be construed as a form of punishment.

In a sense, the need for independence is collective in every part of human culture. The third psychological need as postulated by Przybylski et al. (2010) is relatedness – the desire to feel as though we are significant and that we matter to others. It is also the desire to feel as though we have made some degree of significant contribution to society or the community. The two psychological needs – competence and relatedness somehow go together. It is these two psychological needs that explains why we naturally seek fame, fortune and power. And the reason why for the area of play, society has always put an emphasis on sports and why sportsmen train so hard to achieve success and to be the top in their respective discipline or fields. And it is the distinctive attributes of video games – the engagement, immersion and motivational factors that targets and relates so much with all these psychological needs.





Yu-kai Chou's Octalysis (Sanchez-Gordón et al. 2016), a gamification framework that shows the relationship between essential desires and video game mechanics breaks the psychological needs down even further. The eight essential desires comprise of characteristics such as meaning, accomplishment, creativity, ownership, social influence, scarcity, unpredictability and loss. Meaning and the third psychological need, relatedness is similar. Accomplishment and the first psychological need, competence is also equally similar in nature. While the second psychological need, autonomy resonates in similarity with creativity, ownership and social influence. The remaining essential needs, unpredictability and loss are polar opposites of the following psychological needs – autonomy and competence respectively. Figure 1 shows the distinct relationship between the three psychological needs, and the Octalysis framework.

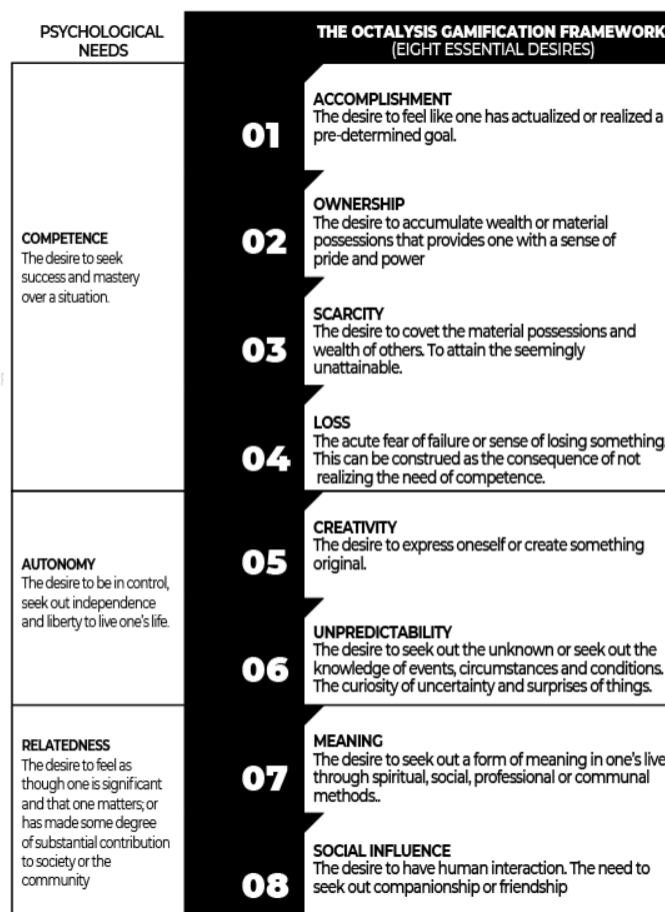


Figure 1: Relationship Between the Three Psychological Needs and the Octalysis Gamification Framework.





Using Chou's Octalysis gamification framework, it is very easy to match the game design principles with the understanding of the psychology of play. According to Chris Crawford (1984), a game designer's principal task is to enquire and pursue the answers to two critical questions - why do people play games and what motivates them to do so? The easy response to both these questions is that play is an integral psychological need required to fulfil our essential innermost desires. The big question is why do games then realize these desires? According to Fullerton (2012), people generally indulge in video game activities to feel a sense of accomplishment or achievement or maybe even to participate in social interaction among friends. They also play games in order to experience a sense of acquiring a new skill or talent as well as to progress in 'life' within a virtual world.

Games, according to Prensky addresses all these reasons through six elements that can literally be found in "every successful game throughout history" as reported in popular 90s computer magazine 'Next Generation' (Prensky, 2001) These elements are divided into the following categories - balance, tension, energy, character, focus, and creativity, the antecedent to the game design principles. In the world of game design and video games, the term balance denotes ensuring that the gameplay is challenging but not impossible; and that the game itself is somewhat fair to the player playing the game. A balanced gameplay enables all the other elements to work in tandem to create an immersive and engaging experience. Contained within the element of balance is the injection of conflict where the game is designed to create a challenge for the players who are already trying to accomplish the game goals and player objectives; or maybe through the throwing of additional challenges by other players or computer-controlled opponents within the game (Fullerton, 2014; Prensky, 2001) All these creates a form of challenge that the game itself must be able to balance out in terms of difficulty and progress; and it is a combination of these two elements that creates the engagement factor that hooks players within the game.

Tension and energy, the second and third element deals with giving the player a sense of achievement through the build-up and progress of the game. It creates a sense of ownership for the player or for the player-controlled avatars contained within the game – which then ensures that the players care about the game goals and constantly tries to achieve it as it gets progressively difficult. Game goals are a hierarchical set of goals sets specific task or a series of game challenges for players to complete (Weitze, 2014) and are the key element of the game. Without game objectives, the game experience itself may lose much of its structure and appeal. The players' positive experience of achieving the objective can be considered the measure of the engagement or involvement in the game. Objectives are a crucial element that provides or enables the players with something to strive towards (Lovell, 2017; Weitze, 2014). This is where energy comes in – where the movement, momentum and pacing of the game is put into play to achieve the outcomes of the game. Outcomes of the game are the winning condition or the satisfactory level of achievement for a player. It is through this delicate juxtaposition of balance and the trio of challenge, tension and energy that induces players to seek out mastery over a game-based situation or level. This translates to the psychological need of seeking competence.





The fourth element, character relates to the depth and richness of the game's experience – the character of the game. If the characters in the game are fully developed and fleshed out, it may create a memorable game experience. Character does not only infer the virtual non-player characters (NPC), the game character or the player's avatar but more importantly, it deals with the player experience. To enable a richness and depth to a game, one should set specific player experience goals that are intended to set the scene for specific types of player experiences encountered within the game (Fullerton, 2014). These experiences can take form in the shape of compelling, unique or interesting game situations. It may even touch on the user experience (UX) which is the connection between the player experience and the game experience that creates another personal experience which is an emotional experience stemming from the gameplay (Wiemeyer et al., 2016). Schell (2019) explains this by stating that while the player and physical game itself is real, the experience is entirely imaginary; and the quality of the experience is the reason why players play video games. In this sense, this relates to the psychological need of autonomy – since through a well-defined player experience or user experience, a player can truly experience an escapism of sorts and immerse themselves in a world of virtual make believe that that they feel a sense of control over. Indeed, as the protagonist in the virtual game world, that their actions have made some degree of momentous influence to the virtual society or the online multiplayer community. This has direct bearing to the psychological need of relatedness.

The fifth element is principally responsible for game engagement. Focus is what makes the game fun and thereby causes the players to focus on the whole gameplay experience. Both previous elements assist in enabling focus. Certain games like angry birds compels a player in a position of wanting which according to Chorost (2011) is comparable to getting a shot of dopamine – the distinctive addiction aspect of gameplay. Creativity, the sixth element is that a game must be in some way unique or have some degree of originality. Creativity does not just imply that the game concept or game play must be original but that the elements of creativity must be present within the gameplay. Games with a high degree of problem solving, tend to trigger a player's creativity. Certain game tasks especially new player actions, tools, weapons, functions or any forms of newly acquired game mechanics can foster a sense of player creativity as the player would have to grapple with learning and using these items. It can be argued that creativity adds a little spice into the entire game experience. It is this element of creativity that provides a sense of autonomy in choices. Through the player's choices and acquisition of new or improved skills, the player is then presented with the sense of the psychological need of autonomy and the illusion of control within the game.

All of Prensky's six elements work in tandem to create an environment where the player is constantly compelled with the desire to seek success and mastery over the game; and to be in control of the game character and gameplay situation; and through that, create a sense of significance in the game world either individually through the game mechanics and storyline; or in a larger online community. This player compulsion can be linked directly to the psychological needs of competence, autonomy and relatedness. However, Prensky's six elements while fundamentally explaining the relationship between video games and people's psychological needs in relation to why people play video games – it does not explain the how. How do game designers then use these six elements in order to create an





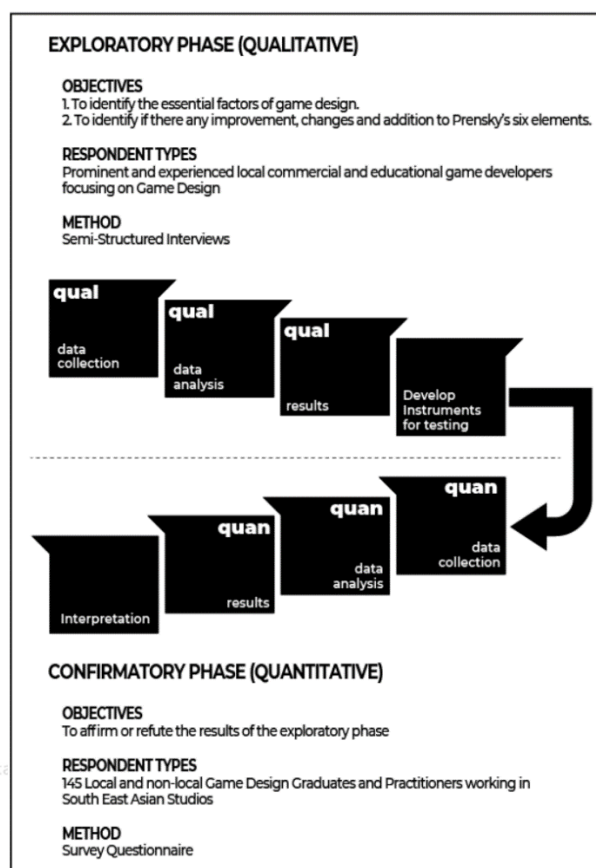
effective play experience that meets the three psychological needs? While the understanding of game design and its methods may vary from designer to designer, does Prensky's six elements still resonate among the game designers in this current day and age? This is a crucial step as Prensky's six elements does show some relationship with the psychological needs and is a big step to the understanding of how to design more engaging gameplay experiences.

Therefore, this study will investigate the attitude, experiences and understanding of game designers on Prensky's six elements through an exploratory stage of semi-structured interviews, focusing on the following research questions: (1) What are the essential factors of game design? (2) Are there any improvement, changes and addition to Prensky's six elements of successful games?

RESEARCH METHOD

An exploratory phase will be the first stage in this research which will eventually lead to the development of the quantitative data gathering instrument consisting of survey questionnaires. The questionnaire responses were designed to gauge the attitude statements of game design respondents and these respondents played an important role in refuting and confirming the qualitative data findings at the exploratory phase. This two-phase data gathering method (Figure 2) in turn will help this study to explore if Prensky's six elements still resonate and are relevant among the game designers today. The research outcome will assist in the development of a model that will then use these six elements, modified if necessary, in order to create an effective play experience process that meets the three psychological needs. Furthermore, this study will attempt to link Prensky's six elements of successful games, the Octalysis gamification framework and the three fundamental psychological needs to a model that will act as a point of reference for understanding the process of how to create more engaging gameplay.



**Figure 2: Research Method**

The interviews in the exploratory stage is aimed at finding out what are the current factors of game design that improves engagement in video games; and if there are there any there any improvement, changes and addition to Prensky's six elements for successful games (the characteristics of balance, tension, energy character, focus, and creativity) by interviewing individual participants. The selected participants for the interviews are represented by six prominent and experienced game developers in the region with a focus and inclination towards game design in various platforms. The exploratory phase interviews are directed in a semi-structured manner with the purpose to have a degree of freedom in expression and collective input of experiences, which will be encouraged throughout the interview process (Chua, 2020).

The outcomes of the interviews will form the basis for a quantitative survey termed as the confirmatory stage geared to gauge the attitude statements of an adequate sample size of 145 academically trained game designer including graduates who studied a specialized course in game design or industry-trained game designers with at least five years minimum of game design knowledge. These requirements are





ideal and crucial because they would have been exposed to the game design processes and principles enough to give a valuable research data input. The contrasts covered descriptive statistics and the discernment of respondents towards the ideal factors in creating video game immersion and engagement as posit by Prensky (2001).

FINDINGS AND DISCUSSION

The exploratory phase findings for the first part of the question focused primarily on three distinct but similar factors which can be summarised into user and player experience. Generally, most of the respondents agreed that in designing a game, the designer must first have very clear user experience (UX) defined. The UX will lay the groundwork for both the game and player objectives. However, the term UX in this case differs from the UX term used within the software engineering circles. According to Bernhaupt (2010), the most widely understood term of UX can be found in certain provisions of game design like the system design and interface. However, there are also other aspects of UX in game design that stresses on emotion, perception and dynamics. Of the three aspects, emotion is linked more on game design experience as it is both an experiential and behavioural response to a personal and meaningful stimulus.

The purpose of game design is to build a strong game experience and both experiential and behavioural responses are critical for building an engaging game experience as games that are tied to a specific emotional experience tends to stay in the memory. That is why UX is so critical in designing games. As one of the interview respondents puts it this way, “it is the feel of the game. The respondent went on to explain that it is what the player is meant to experience as a result of playing the game. Several of the respondents also stated that the very principle of game design stems from the understanding of human behaviour in the first place.

The respondents agreed that one of the primary phases in game design is to warrant that the game and player objectives are well defined. Contained within the elements of game and player objectives are the elements of rules and outcomes – and when all these different elements are working in harmony, the game is then able to achieve balance (Squire, 2003; Stout, 2018). Game coherence could be an alternate phrase to describe the state in which all those elements function collectively. A coherent gameplay could lead to an overall positive player experience. A positive game experience combined with the player’s sense of progression within the game could lead to a form of mastery, a component of self-efficacy, which is the players’ belief and level of confidence in their ability to accomplish game goals or objectives. The role of mastery most likely contributes to the overall enjoyment of the game and could play a significant aspect within the context of social gaming, where the players’ mastery of the game brings a form of recognition from social game playing circles. This is the main reason why game designers need to map out game objectives, player objectives, rules and outcomes immediately after the initial concept of the game is drawn up; and that a well-drawn up plan for these elements to work coherently can resonate so much within the psychological needs of competence and relatedness within the players.





The second research question highlights some fascinating views on Prensky's six key structural elements. While some of the elements are considered important to create engaging games, there are other elements that are crucial or in fact, necessary for the other elements to function. One of it is the core element of character which at least four of the respondents identify it as closely related to the concept of user experience (UX). This element should then be elevated to a core component of game design – the first step in crafting the entire game – as most of the interview respondents believe that UX is a key component or a primary step in the entire process of game design. Some of the identified key elements of Prensky's six key structural elements share certain qualities with the other concepts that was addressed by the respondents but were termed differently. Some of the elements were important individually enough to justify a split from the original structure as postulated by Prensky.

For example, the element of balance encompasses the elements of rules, feedback, outcomes and goals – elements could be viewed wholly as individual standalone elements. Prensky's six key structural elements works in context and fundamentally explains the relationship between video games and people's psychological needs in relation to why people play video games. However, it does not however go into the exact detail on how to break these six structural elements into elements that can be used further to create an effective play experience that adheres to the three psychological needs. For that, this research would have to further expand on these elements and create a model that game designers could use as a guide for game design. To do so, the second part of the data collection would be conducted to refute or affirm the further expansion and introduction of the new and existing elements that are crucial to the game design process. These elements would be the ones that were suggested by the interview respondents in addition to Prensky's six key structural elements.

The results of the confirmatory phase survey were analysed in order to measure the level of acceptance of the respondents in refuting or affirming the findings of the earlier interviews. The findings from the survey establishes the fact that storyline, theme and genre is not entirely a necessity within the scope of game design but determining a strong UX concept is essential. Both the exploratory phase interviews and confirmatory survey respondents agree with the proposition. In the exploratory phase interview, it was established that rules, outcomes and feedback are key components for an engaging gameplay and are directly missing from Prensky's six key structural elements. These elements the respondents stated, are necessary in the preliminary stages of game design and the confirmatory survey respondents also agree with this proposition (n=74). Game dynamics which includes characteristics such as challenge, competition, conflict and opposition while indirectly present within Prensky's six key structural elements, is a concept that should be standalone elements according to the confirmatory phase survey respondents (n=92). The respondents also agree that those elements are an essential element in game engagement. The exploratory interview respondents also established that core game mechanics game should be included as one of the elements of balancing and is a requirement in game engagement. This is also reflected through the confirmatory survey results (n=102).





THE RULES OF IMMERSION AND PLAYER EMOTION (RIPE) GAME DESIGN MODEL

While Prensky's six key structural elements answers some of the questions in relation to why people play video games and its link between gamers and their psychological needs, it does not go into the detail of how game designers can utilize these concepts in order to create an effective play experience that satisfies the three psychological needs. The purpose of the research is not only to refine and expand the scope of the six key structural elements but to produce a model for best practices in the preliminary stages of game design. According to the research findings, the main starting point for that is the identification of the UX concept.

According to the exploratory phase interview respondents, UX can be termed as the emotional context of the game which then governs the other host criteria such as the whole foundation and narrative structure of the game which encompasses the user interface, game design, genre and art style. UX is the heartbeat of the game that incorporates the entire the thematic and aesthetic propagation. Secondary to UX is the identification of player engagement elements. While the notion of the strategic and conceptual portion of the game lies with UX, the identification of player engagement elements represents the tactical aspects that is crucial in attaining the anticipated outcomes of the game. Lastly, is the refinement and polishing of the game design stage that represents the body of the game and the final element that unites the entire experience of the game.

According to Tan (2019), the basic concept of video games can be explained in three different stages (i) positive player engagement for sustained play, (ii) thematic and/or aesthetic propagation; and (iii) positive player understanding of game rules to operate and fulfil game task conditions. All these elements deemed obligatory for a video game to be engaging. Thus, through the research data gathered, the following Rules of Immersion and Player Emotion (RIPE) Game Design Model (Figure 3) was formulated to provide game designers with a guide to use as an expanded understanding of Prensky's six key structural elements in order to create engaging video games; in lieu of the three psychological needs.



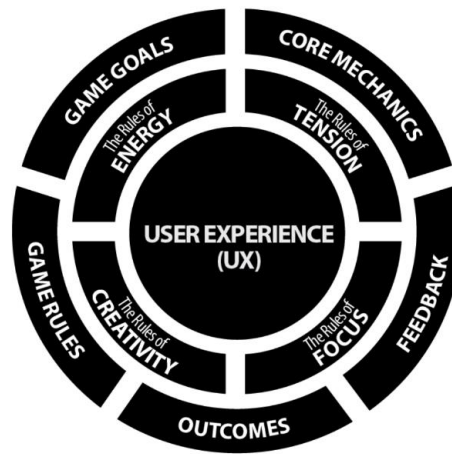


Figure 3: The RIPE Game Design Model

The model divides the game design process into three distinct design stages. The core stage is the identification of the game's contextual emotional experience through user experience (UX) to create a thematic and aesthetic gameplay propagation. The second stage is the identification of the four elements that promotes positive player engagement and immersion for sustained play, which are critical to the development of an engaging and effective video games. The third stage deals with ensuring that the player understands the game rules, associated systems and mechanics to operate and fulfil game task conditions in line with the outcomes and goals of the game. This can be considered as the player experience portion of the model which combines the emotional, social, and cognitive experiences resulting from the interaction between players and the game.

The second stage is divided into four rules of thumbs that is derivative from the combination of Prensky's six key structural elements and both exploratory and confirmatory research findings. The four elements that promotes positive player engagement and immersion for sustained play are:

- 1) *The rules of energy.* This rule of thumb focuses on the crafting of game elements that directly impacts player engagement and it entails the notion of ensuring that the elements of movement, momentum and pacing are utilized in a game in order to give the game depth and richness of experience. Several examples of how to utilize these elements are:
 - a. When designing a game, ensure that the gameplay varies its activities and pacing thus create a sense of tempo or rhythm to the game. This can be moments of intense gameplay followed by moments of lull.
 - b. When designing a game, ensure that there is a constant application of pressures on the players at certain points in order to maintain the tempo and allow the player to be slowly immersed in the rhythm of the game.



- c. When designing a game, ensure that game be consistent and challenging in reaction to the player's actions in the gameplay. Ensure that even in moments of lull, that there the players do not get bored. Keep engaging the player either through the progression of the story or by the actual gameplay.
- 2) *The rules of creativity.* This rule of thumb focuses on gameplay elements that are utilized to constantly keep the players guessing and on their toes. This is comparable to keeping a player at their edge of their seat in *trying* to either outsmart the game or passively being amazed at how the gameplay is progressing from a narrative point of view. One of the more effective methods is through the clever manipulation of game space and time. Video games can be described as temporal medium where the players act out the game through the act of gameplay and the narrative structure that unfolds over time. The understanding of how to construct game space and game time is crucial as it allows narrative comprehension to be linked with the player's game play experience (Wei et al., 2010). Simply put, this is the attention-grabbing aspect of the game, which make makes the game stands out from the rest of other games in its genre – and it exists in the form of a creative setting, narrative, story, art-style, mechanics and treatment. Examples of how to utilize these elements are:
- a. When designing a game, ensure that there is a level of consistency between the game and the plot in order to suspend disbelief and create an engaging game experience.
 - b. When designing a game, ensure that the player experiences a world that is persistent in order to create the sense of reality and thus, create an immersive virtual environment.
 - c. When designing a game, ensure that the game should provide players with a variety of visual, tactile and auditory changes to evoke an affective player reaction and that those sensory elements do not detract the player from the gameplay or the experience (Ng, 2018).
- 3) *The rules of tension.* This rule of thumb emphasizes on ensuring that the players care about the definitive goals of the game itself and continuously endeavours to accomplish it even as it gets progressively difficult or complicated. This rule works on the principle that the game and user experience sustain a level of coherence in order to keep the player at the edge of their seats and totally enthralled in the game. Examples of how to utilize these elements are:
- a. When designing a game, ensure that as the game progresses in levels and that the players experience greater challenges as the game progresses. The statement that a game must be easy to play but difficult to master rings true here.
 - b. When designing a game, ensure that the game's challenges do not overly frustrate the players resulting in them wanting to quit, rather than continue the game experience.
 - c. When designing a game, ensure that the challenges create a positive game experience that is in line with the game world and the overall user experience.



- 4) *The rules of focus.* This rule of thumb focuses on ensuring that the game sustains the level of fun and additivity even with all the other rules put into place. The concept of flow captures this rule perfectly. Flow is achieved when the player is so focused on the game that they lose all concept of time. This rule deals with the application and creation of an interactive experience with the intention to immerse the players into the game. This rule states that game designers must create game experiences engaging enough to immerse a player and put them in the state of 'flow' and to constantly keep them in that ideal state. To do so, requires a balance between the abilities of the player and the level of difficulty afforded in the game (Omori, 2012). Examples of how to utilize these elements are:
 - a. When designing a game, ensure that the player can perceive a sense of control and that the perception that the player's controls and actions have an impact onto the game world and environment.
 - b. When designing a game, ensure that the game constantly rewards the players for their actions within the game.
 - c. When designing a game, ensure that the game creates a sense of personal involvement from an emotional standpoint. Emotions are considered as a powerful agent that affects the entire player experience and augments the level of immersion in the game for the player (Baharom, 2014).

The third stage is divided into five separate elements that when working in collectively among each other, realizes game coherence which translates into a positive player understanding of game rules, systems and mechanics to operate and fulfil game task conditions. The four elements that is necessary to promote a positive player understanding play are:

- 1) *Game Goals.* Game goals can also be termed as game objectives. Game goals are a key element without which the game experience itself may lose much of its structure and appeal. Game goals *define* the objectives that the players should achieve within the confines of the game rules and the game world; and it provides a crucial element that enables the players with something to strive towards. The goals must be clear and there should be a mix of short term, long term and overarching goals.
- 2) *Core Mechanics.* Core mechanics or game mechanics are the formal aspects of the game that is required for the game to function or for the player to play the game effectively. It can also be termed as the features of the game – the tools or actions that players are given to accomplish certain tasks or complete the game within the confines of the rules and the game world. Every mechanic of the game must relate to the goals and objectives of the game.
- 3) *Feedback.* Feedback is method in which the game is designed to react in an immediate, consistent and exciting way to the players' actions. It is also a visual, tactile or aural reaction to the either the player's action in the game or the game's reaction to the player.
- 4) *Rules.* Rules are the stated limitations or boundaries of the game and what can or cannot be done within the context of the game world. It also states the what actions can be done or what game



objects are; and can do within the confines of the game. Rules also may be descriptive of what may happen in various in-game situations that might arise for the players based on their action or inactions. According to Tan (2010), for game designers, the key factor that determines the quality of a game lies in the proper setting of rules as these rules that define the operation of the virtual game world.

- 5) *Outcomes*. Outcomes are the clearly stated conditions for winning the game or the satisfactory level of achievement for a player to win or achieve certain key milestones within the game – and what the outcomes for achieving the game goals are. It can be in the form of rewards, items, points and unlocking certain levels in the game.

CONCLUSION

People obsessively play games especially video games because games affords us the opportunity to fulfil the higher-level psychological needs operating in our lives, predominantly in the area of self-esteem and self-actualization. These areas of esteem and self-actualization cover attributes like dignity, the desire to seek out achievement and mastery over something; and the desire for attain reputational gains or respect. All these needs are categorized into three fundamental psychological needs which consists of competence, autonomy and relatedness. The game design principles are sound because it addresses these concerns in the players. Whether this is something that game designer discovered by chance or through a careful analysis of human behaviour may be unknown at this point – but the fact remains. Game design and the fundamental psychological needs are intrinsically connected as shown in the research. The Rules of Immersion and Player Emotion (RIPE) Game Design Model while existing as an early stage guide for educational game designers use to understand the game design principles within the context of psychological needs may not be applicable to every single type or genre of video game or educational games. It only acts as a general guiding principle for the most part of the pre-production stage of the game design process. This is primarily because video games are such a diverse and complex form of interactive medium, it would not be possible to create a model that fits the purpose for the development of all types of games in the market. Nonetheless, the RIPE Game Design Model can offer a set of guiding principles for educational game designers to use in the creation of educational games based on the best practices and process that most game designers are familiar with and has prescribed to over the course of a few decades. What this model does is to better understand the complexities of video games and present the core essential components of the ingredients to making an engaging video games for educational purposes in areas such as serious games, educational games and game-based learning.

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REFERENCES

- Baharom, S. N., Tan, W. H., & Idris, M. Z. (2014). Emotional design for games: A framework for player-centric approach in the game design process. *International Journal of Multimedia and Ubiquitous Engineering*, 9(10), 387-398.
- Bernhaupt, R. (Ed.). (2010). Evaluating user experience in games: Concepts and methods. Springer Science & Business Media. <https://doi.org/10.1007/978-1-84882-963-3>
- Chorost, M. (2011). *How I kicked my addiction to the iPhone game Angry Birds*. Retrieved November 19, 2017, from <https://www.psychologytoday.com/blog/world-wide-mind/201101/how-i-kicked-my-addiction-the-iphone-game-angry-birds>.
- Chua, Y. P. (2020). Mastering research methods. 3rd Ed. Mcgraw-Hill Education.
- Crawford, C. (1984). *The art of computer game design*. Retrieved from https://www.digitpress.com/library/books/book_art_of_computer_game_design.pdf.
- de Mézerville López, C. M. (2019). *Adolescence and creativity: cognitions and affect involved in positive youth development*.
- Fullerton, T. (2014). Game design workshop: a playcentric approach to creating innovative games. 3rd Ed. CRC press.
- Heick, T. (2017) *Why People Play Video Games* [Internet]. TeachThought. Retrieved 29 January 2020 from: <https://www.teachthought.com/learning/why-people-play-video-games>.
- Jones, C., Binhui, S., & Keynes, M. (2011). The Net Generation and Digital Natives. A Literature Review Commissioned by the Higher Education Academy. *Open University Review in United Kingdom*, 1(56).
- Judd, T. (2018). The rise and fall (?) of the digital natives. *Australasian Journal of Educational Technology*, 34(5).
- Lovell, S. N. C. (2017). *The Pyramid of Game Design*. CRC Press.
- Ng, Y., Khong, C. W., & Nathan, R. J. (2018). Evaluating affective user-centered design of video games using qualitative methods. *International Journal of Computer Games Technology*, 2018.
- Omori, M. T., & Felinto, A. S. (2012). Analysis of motivational elements of social games: a puzzle match 3-games study case. *International Journal of Computer Games Technology*, 2012.
- Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the horizon*, 9(5), 1-6. <https://doi.org/10.1108/10748120110424816>
- Prensky, M. (2001). Fun, play and games: What makes games engaging. *Digital game-based learning*, 5(1), 5-31.
- Przybylski, A. K., Rigby, C. S., & Ryan, R. M. (2010). A motivational model of video game engagement. *Review of general psychology*, 14(2), 154-166.
- Sanchez-Gordón, M. L., Colomo-Palacios, R., & Herranz, E. (2016). Gamification and human factors in quality management systems: Mapping from octalysis framework to ISO10018. *European Conference on Software Process Improvement* (pp. 234-241).
- Schell, J. (2019). *The Art of Game Design: A book of lenses*. AK Peters/CRC Press.
- Squire, K. (2003). Video games in education. In *International journal of intelligent simulations and gaming*. Retrived from: <https://website.education.wisc.edu/kdsquire/tenure-files/39-squire-IJIS.pdf>.
- Stout, M. (2018). *Gamasutra - Evaluating Game Mechanics For Depth*. Retrieved from: https://www.gamasutra.com/view/feature/134273/evaluating_game_mechanics_for_depth.php?print=1.
- Super Data (2019). *2019 Year in Review: Digital Games and Interactive Media*.
- Taipale, S. (2016). Synchronicity matters: defining the characteristics of digital generations. *Information, Communication & Society*, 19(1), 80-94.
- Tan, C. I. (2019). Linking the Elements of Learning, Assessment, and Play Experience in a Validation Framework. In *Design, Motivation, and Frameworks in Game-Based Learning* (pp. 93-122). IGI Global.
- Tan, W. H. (2010). *Game-based learning in formal educational contexts: How subject matter experts and game experts could collaborate to design and develop games* (Doctoral dissertation, University of Warwick).
- Vansteenkiste, M., Ryan, R. M., & Soenens, B. (2020). *Basic psychological need theory: Advancements, critical themes, and future directions*.
- Wei, H., Bizzocchi, J., & Calvert, T. (2010). Time and space in digital game storytelling. *International Journal of Computer Games Technology*, 2010.
- Weitze, C. L. (2014). Developing goals and objectives for gameplay and learning. In *Learning, education and games: Volume one: Curricular and design considerations* (pp. 225-249). Carnegie Mellon University ETC Press.
- Wiemeyer, J., Nacke, L., & Moser, C. (2016). *Player experience*. In *Serious Games* (pp. 243-271). Springer, Cham.
- Yogman, M., Garner, A., Hutchinson, J., Hirsh-Pasek, K., Golinkoff, R. M., & Committee on Psychosocial Aspects of Child and Family Health. (2018). *The power of play: A pediatric role in enhancing development in young children*. *Pediatrics*, 142(3).
- Zosh, J. N., Hopkins, E. J., Jensen, H., Liu, C., Neale, D., Hirsh-Pasek, K., ... & Whitebread, D. (2017). *Learning through play: a review of the evidence*. LEGO Fonden.

