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Gamification Mindset

Human–Computer Interaction Series

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Chapter 1
Technology Impact Mindsets

Abstract As the world and today's societies continue to change at a fast pace, organizations are also evolving their work practices, especially the areas of learning and development. With the notion that technology impact mindsets, especially the generation that grew up with (video) games, is increasingly seen everywhere and accounting for a major part of the workforce, organizations are turning to the latest technology to support their transformation process that entails engagement and motivation. Having the potential to serve these purposes, gamification and games have become one of the most talked topics in today's business world that is characterized by changing mindsets with the arrival of an increasing number of millennials and younger. Organizations are eagerly exploring how the game processes and experiences can be used to create more engaging workplaces. This chapter talks about it, highlighting how technology impacts the mindsets, what preferences do the young people hold, and how they are made more engaged and dedicated toward the organization through continuous growth processes facilitated by the gamification processes.

Keywords Business transformation · Workplace · Learning and development · Gamification · Game-based learning · Feedback · Mindset · Millennials · Video games · Technology

1.1   Introduction

The world's learning and development initiatives are evolving faster with the advancement of technology. Organizations find themselves in a dire need to adjust their current learning and development processes and redefine the peoples' motivation and performance strategies in a way that is compliant with the latest technology trends, to achieve higher efficiency at the workplace and increased motivation of their employees.

The collective working ecosystem today is changing, and one of the biggest factors behind this trend is millennials. This younger, super-charged generation is

already taken over the market and soon would dominate the leadership roles in business offices worldwide. As such, the way of things before is long gone, and replaced by a diverse means of communication, more telecommuting, and an expectation of rising social awareness.

Millennials are eager to look for creative ways to stay motivated and engaged in the workplace. One way to motivate these humans is to integrate gamification, mainly within human resources (HR) areas such as performance assessments, recruitment, and reward systems. Gamification blends measurability, challenges, and rewards, which lead to a more vibrant workplace. It also increases the share of feedback and interdisciplinary collaboration in the company, if used efficiently.

A lot of surveys have been conducted to know the millennials' changing mindsets and expectations. It has been found that millennials do not have the opportunity to show their best work or have access to tools to contribute their ideas and suggestions. Using gamification to address this can affect not only the general commitment but also help a business to become a magnet for the best talents.

It is a popular thought that the members of this generation require a sense of value and purpose in their lives, and because many make their hopes for fulfillment and happiness on their careers, they expect a purpose that is beyond financial success and profit from the organizations they work for. The ambitious, passionate, and career-driven millennials are confident in their potential, but they do realize and think that it must be developed. The desire and drive to learn and grow is one of the most differentiating qualities of this generation and the ones coming after.

Amy and Brandon (2016) conducted a study that is also reflected in Gallup surveys' findings stating that this quality seems to be the strongest and biggest core drive in the context of the millennial employment and most valuable source of the intrinsic motivation for the gamified system. Development and accomplishment make the gist of games and gamification, which are fundamentally about learning and practicing the new skills and knowledge guiding the users for a required goal via mastery of passing through difficulty levels and making the whole process deeply immersive, engaging, and fun.

Empowerment of creativity, expressing ideas, and feedback seems to be when users are engaged in the creative processes where they must repeatedly determine and try different combinations. Today's employees not only want to express their creativity but they also need to see the outcomes of their creativity, get feedback, and respond to it in return. Millennials aspire for autonomy and empowerment at their workplace. They want to be called on to give their unique ideas and input on critical issues. They want to get recognized for their skills and strengths and guided in growing their potential. In short, they need continuous feedback, a sense of competition, and a realization of rewards. However, again and again, the surveys of millennials show prevailing dissatisfaction with feedback's quantity and quality they get from their organizations, of whom they expect continuous support, leadership and mentorship, backed by the latest technology (Annie 2016).

This gap is the one that a gamified system is fully equipped to help fill. The feedback loop (both positive and negative) is one of the key concepts in game design and is among the most important game mechanics that gamification tries to

implement in the real-life context. Ownership and possession are another drive for the millennials. Psychologically, it is perceived that they feel motivated when they think that they own something. When the user feels a sense of ownership, he or she innately wants to make what he or she owns much better. Since this drive is most closely linked to the loyalty and engagement, this seems to be the weakest link in the millennial's employee profile that must be the key focus of the organization's gamification efforts.

Psychologically, the mindset of the millennials also looks for the social elements that drive them, including acceptance, mentorship, companionship, social responses, envy, and competition. They are the most connected generation and the most prominent social media users. Being aspiring leaders, the millennials are developing their influence and reputation in social networks even before they enter the labor market and keep curating their social media personas.

Gamification has the potential to tap into this drive by offering resume-worthy sharable content that includes challenges, experiences, achievements, badges, certificates, etc. When organization's values, purpose, and mission are aligned with the millennials' personal interests and values, they could be the influential ambassadors for their employers while developing their own reputation.

1.2   Business Transformation at the Workplace

Tim (2017) study shows that a large percentage of the business transformation goals are not achieved because of lack of engagement. In an era when digital transformation is occurring at breakneck speeds in the digital landscape, organizations today cannot afford to fail at such change. They must engage their employees in a way that they don't only sign up for the job; rather, they also sign up for the whole ride. Engagement is not a new issue. It is just an increasingly important problem. Since decades ago, employees have been talking about the mindsets that entail favoritism, lack of transparency, lack of feedback, fuzzy goals, etc., all of which kill the millennials' commitment.

In the area of organizational psychology, the workplace motivation is one of the most bulging areas of interest for both business scholars and psychologists alike (Steers et al. 2004; Wright et al. 2001). Work motivation is defined as the force that pushes people to behave in a certain way that directs, energizes, and sustains the work behavior (Steers et al. 2004).

This idea has gained a great deal of attention; research has shown that work motivation usually results in the psychological well-being of today's employees, increased performance, solid organizational trust, and commitment, as well as job satisfaction (Gagné and Deci 2005a, b). Matthews et al. (2001) proposed that the two aspects of motivation, interest (intrinsic) motivation and success (extrinsic) motivation, are both elements to a higher order factor of task engagement. Designing the work environment with the purpose of having an effective

performance results in both intrinsic and extrinsic rewards. It has been advocated as a method to yield total job satisfaction (Porter and Lawler 1968).

Gamification at the workplace is the concept of digital motivation via gaming promises to breathe new engagement into the employees worldwide. We have grown accustomed to an era of digital transformation. Hence, it is the real-time engagement tools popping up as the future of work. Using gamification at workplace, especially in the human resources (HR) areas including recruitment, training and development, performance appraisals, feedback management, and rewards management, doesn't imply turning work into a game. Instead, it plays on the psychology that drives the human engagement, a drive to improve, outdo, and compete, and to get rewarded instantly while doing so. The technology is the means to out this psychology to work in the organizational sphere.

1.3   Gamification in the Human Resources (HR)

Gamification is a fast-rising trend in human resources sphere (Deterding S. et al. 2011). A study by Gallup (2017) reveals that more than half of workers are significantly disengaged at work, and organizations are looking for the innovative ways to improve the organization culture and get that number down (Frith 2014).

Usually, it is assumed that millennials grown up playing games, and nowadays, people play mobile games whenever they get a chance. Gamification in human resources is pushing the way up, but with the goal of changing mindsets and increasing engagement, making the organization processes more interesting and engaging for the employees.

There are two kinds of gamification often seen in organizations to change mindsets: the structural gamification and serious games. In structural gamification, gaming elements including badges, points, leaderboards, and levels are applied to processes and activities. Serious games are where you make a game or simulation for the purposes other than entertainment like training simulation. When executed properly, many organizations have reported outstanding results from the game-based design, like increased efficiency, engagement, accelerated training and development, and faster transformation process.

It implies that if your employees want some innovation, you may want to experiment with the gamification in your human resources processes. Like with all other initiatives, you must first determine the goal. It is also very important to focus on the motivation behind the efforts instead of only the game elements and mechanics.

Some of the applications for gamification at the workplace, in particular, in human resources include the following:
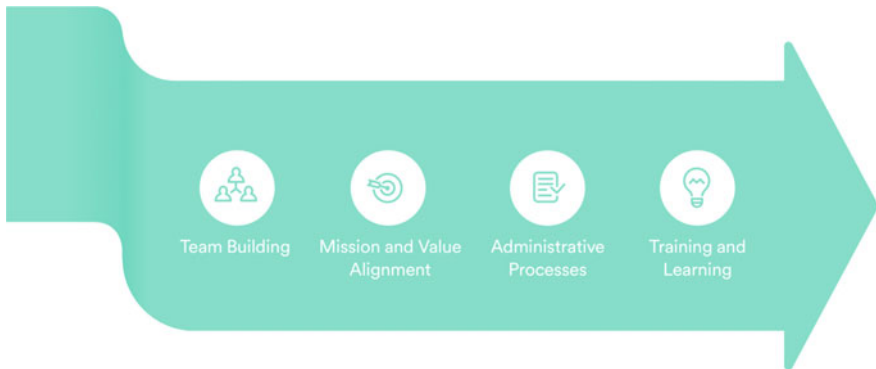
- **Training and learning**: The training content can be revamped by turning it into a game-like application. Employees are made to work through levels to gain badges or points. It helps you to spot out the leaders at your town hall or honor them with enhanced responsibility.
- **Administrative processes**: Onboarding the documents and expense forms can be boring. The timely rewards of points in a gamified application can encourage efficiency.
- **Mission and value alignment**: Reward employees with "culture points" or "value badges" for living by your company values. Give everyone the opportunity to recognize other employees when they go above and beyond in culture areas.
- **Team building**: Gamification encourages employees to get to know each other by adding a collaborative and competitive team element to events, requirements, and processes.

Employee experiences, especially of those belonging to today's millennial generation and younger, are crucial to developing a wealthy and healthy workplace and to make people happy at work, ensuring that your business strategy is fully aligned with gamification techniques.

1.4   Extrinsic and Intrinsic Motivation for Employees

Here, we refer to gamification and games, or even game-based experiences.

Intrinsic motivation is the motivation to perform a task or duties by the employees as they find it interesting and meaningful. It is the drive that is present within a person instead of being relied on any external factor. On the other hand, the extrinsic motivation is driven by the external motivators. It says that satisfaction doesn't arise from the activity itself but, instead, from the extrinsic consequences of that activity (Gagné and Deci 2005a, b).

Ryan et al. (2006a, b) asserted that games are intrinsically motivating since they are designed and structured in a way that satisfies the fundamental needs of the player, including competence, relatedness, and autonomy. For instance, the performance feedback from the mechanics of points does facilitate the intrinsic motivation by uplifting a sense of competence (Fisher 1978), while the higher personal value or interest from the narrative mechanic can boost the level of intrinsic motivation via higher perceived autonomy.

1.5   The Balance Between Performance and Engagement

As mentioned, one of the key reasons that today's companies are interested in adopting gamification is its potential and ability to increase employees' engagement. Engaged and motivated workers are highly desirable since they are more effectively and energetically connected to the work activities than the unengaged workers, and rate themselves as better able to perform well for their job demands. Work engagement is defined as a fulfilling and positive state of mind that entails three major components: dedication, vigor, and absorption (Schaufeli et al. 2002), and task engagement is based on higher ratings of task demand, performance, and effort (Matthews et al. 1999).

Vigor defines the mental resilience, positive levels of energy, and readiness to expend effort on the job, as well as persistence through difficulty. Dedication is characterized by strong levels of involvement in work tasks accompanied by a sense of significance, enthusiasm, inspiration, pride, and challenge. Also, the absorption refers to being completely concentrated and deeply engrossed at work, so that time swiftly passes when completing tasks, finding difficulty in emotionally detaching from work (Schaufeli et al. 2002).

Engagement is usually taken as an antipode of burnout having the key engagement dimensions of the vigor while the dedications are considered as the direct opposites of the major burnout dimensions of exhaustion and cynicism, respectively (Maslach et al. 2001).

The association between performance and engagement is substantial. A meta-analysis by Harter et al. (2009) revealed that employee engagement is associated with each of the nine performance outcomes researched upon, which include customer ratings, profitability, productivity, turnover (in both high- and low-turnover companies), safety incidents, absenteeism, shrinkage, safety incidents, and quality. The outcomes were consistent across different companies, industries, and countries which specify high generalizability.

The process behind how gamification can increase work engagement can be explained through the job demands–resource (JD-R) model (Burke and Hiltbrand 2011).

Motivational resources at the task level, including autonomy, feedback, and task significance, have the potential to satisfy the basic human needs as described by the self-determination theory (SDT); the same psychological needs that Ryan et al. (2006a, b) found that games satisfy, which, in turn, increases intrinsic motivation (Deci and Ryan 1985). Job resources may also be instrumental in achieving work goals and thereby can increase motivation extrinsically. According to the JD-R model, this increased motivation leads to organizational outcomes of high-work engagement, low cynicism, and excellent performance (Deterding et al. 2011).

1.6 Games at Work

If we talk about the games being incorporated in today's workplaces, we often talk about serious games, as they are highly effective for most of the organizations. Serious games are the games developed to enhance the learning, and players usually engage in serious games with this understanding (Derryberry 2007). Also called the immersive learning simulations, game-based learning, games for learning, game-based pedagogy, and gaming simulations—serious games are created with certain learning outcomes in mind that would yield to measurable, sustained changes in the employees' performance or overall workplace behavior.

Serious games can be customized as per the users' needs, as such they offer flexibility, to apply whatever they have learned in a learning and development (L&D) experience and apply it in a safe, growth-oriented, and simulated environment. For example, healthcare professionals can practice a new medical procedure using a serious simulation game before introducing it in the workplace. There is also evidence that serious games can develop soft skills like emotional intelligence, communication management, and critical problem solving and collaboration skills (Ahmad and Seymour 2008).

The big difference in the development process between games and serious games is the "serious" background, the learning which has to be worked out and developed by subject matter and pedagogical experts. They are especially important in the phase "objective target" as well as "preproduction," where they have a great influence on the whole process.

A crucial point in the design of a serious game is the interface between the designers of the game and the subject matter experts as well as the pedagogical and didactical experts. This means that the production of a serious game is regarding the content more complex of more interfaces between experts with different interests. The process which defines the steps needed for the development and implementation of content is named instructional design.

Here are some popular technology mixes found in today's organizations to change the mindset of their workforce to embrace learning:
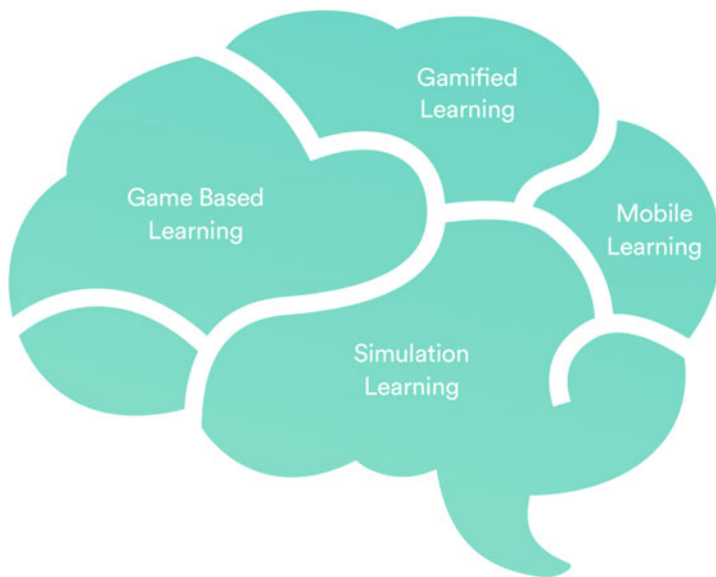
- **Gamified learning**:

Today's learners are digital natives and have new profile. They grew up with digital technologies and have different learning styles, new attitude to the learning process, and higher requirements for teaching and learning. Instructors are facing new challenges and are often reminded how to solve important issues related to the adaptation of the learning process toward students' needs, preferences, and requirements. Modern pedagogical paradigms and trends in education create prerequisites for use of new approaches and techniques to implement active learning. Gamification in training is one of these trends. The aim of the current work is to study and present the nature and benefits of gamification and to provide some ideas on how to implement it as a broader learning concept.

- **Simulation learning**:

A realistic, controlled risk environment where students practice specific behaviors and experience the impact of their decisions. Simulations are similar to serious games, but they simulate real-world things and their purpose is user training in an environment resembling real life.

According to Shumucker (1999), simulations are very useful because they help students explore new concepts and gain an understanding of the interplay between related complex phenomena. The student is thus presented with the opportunity for some new level of understanding. Simulations are also usually based on some underlying model of the phenomena, environment, or experience and usually have some degree of unpredictability. Simulation learning are the examples of experiential instructional methods in that they are interactive and foster active learning.

- **Game-based learning**:

The use of play in an educational context and for purposes of training and development is by no means a new phenomenon. However, the growing acceptance of games as mainstream entertainment has raised the question of how to take advantage of the promise of games for educational purposes.

Definitions of game-based learning mostly emphasize that it is a type of gameplay with defined learning outcomes (Shaffer et al. 2005). Usually, it is assumed that the game is a digital game, but this is not always the case. A corollary to this definition is that the design process of games for learning involves balancing the need to cover the subject matter with the desire to prioritize gameplay (Plass et al. 2010).

- **Mobile learning:**

The increasing usage of wireless technology, such as smartphone usage, changes today's individual communication, (a person's) information seeking behavior, and the lifestyle of individuals in particular (Kim et al. 2013). The interaction with mobile devices and their use for learning purposes extend the traditional learning paradigm into a new area of mobile learning (Su and Cheng 2013).

Research suggests that mobile devices enable individuals to experience a more interactive learning, thereby improving engagement, learning, and course retention

(Stoerger and Joosten 2011). Furthermore, using new technologies such as mobile devices can enhance motivation, deliver information when needed, encourage to solve problems, and satisfy curiosity (Sharples et al. 2002).

1.7   Conclusion

The collective working ecosystem today is changing and one of the biggest factors behind this trend is millennials and younger generations. This younger, super-charged generation is already taken over the market and soon would dominate the leadership roles in organizations all over the world. Today's employees not only want to express their creativity, but they also need to see the outcomes of their creativity get feedback and respond to it in return. Millennials aspire for autonomy and empowerment at their workplace. The mindset of millennials also looks for the social elements that drive them, including acceptance, mentorship, companionship, social responses, envy, and competition. Gamification is the concept of motivation via gaming promises to breathe new engagement into the businesses worldwide. A lot of millennials have grown up playing games, and nowadays, people play mobile games whenever they get a chance. Gamification in human resources is pushing the way up, but with the goal of changing mindsets and increasing engagement, making the organization processes more interesting and engaging for the employees. Intrinsic motivation is the motivation to perform a task or duties by the employees as they find it interesting and enjoyable. It is the drive that is present within a person instead of being relied on any external factor. On the other hand, the extrinsic motivation is driven by the external motivators. It says that satisfaction doesn't arise from the activity itself but, instead, from the extrinsic consequences of that activity. An increasing number of companies who want to drive their innovation are using gamification as part of their business strategy. Serious games are the games developed to enhance the learning, and players usually engage in serious games with this understanding. Also called immersive learning simulations, game-based learning, and gaming simulations, serious games are created with certain learning outcomes in mind that would yield to measurable, sustained changes in the employees' performance or overall workplace behavior and changes in mindset.

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Chapter 2
Gamified Thinking

Abstract The use of game elements in nongame contexts is one definition of gamification. As mentioned in the previous chapter, extrinsic gamification exists where game elements are added to processes, such as things like badges, progress bars, points, etc. Intrinsic gamification is more about using the motivation and behavioral design for engaging users. We will explore both kinds in this chapter. We will demonstrate the concepts and differences between games and gamification and everything lying in between: Game thinking, game-based solutions on a simple and advance spectrum, the core ideas, game design, serious games, gamification techniques, applications of gamification in different areas, gamification technologies, benefits, and models.

2.1 Introduction

Before we go into the gamification concepts, psychology, and motivations, let's have a look at its original definition. Back in 2002, Nick Pelling explains the term gamification as an "application of game-like accelerated user interface design to make electronic transactions both fast and enjoyable" (Marczewski 2015). Nowadays, the more commonly used definition of gamification is as follows.

Gamification is used as the experiential learning technique, and even beyond, to encourage the engagement with the product or a service or a brand. Gamification can be seen in almost each field now, from education to business to life coaching to apps and more. It has the power to enhance a user experience by immersing the users with a gamified system that both engages and stimulates them.

Gamification is popular since it is a great solution to use for retention. Offering the incentives to users and also encouraging them to accumulate great rewards all through their journey can instantly enhance their involvement with a product or service. The longer the users spend interacting with a product or service, the longer their lifetime value for the business will be.

Gamification takes the most relevant elements of games and applies those elements to nongame entities and contexts to encourage users to exhibit certain behaviors. It engages them fully and enable them to leverage many of their natural desires: learning, socializing, achievement, mastery, and status. Behaviors that initially seem hard, tedious, and boring can be made fun. Users get motivated to perform actions and engage in specific behaviors in return for rewards (Hamari 2015).

Rewards lead to the release of dopamine in human brain. Dopamine and endorphins are responsible for the feelings of pleasure and the mentioned chemicals come out during the positive game-playing experiences. Gamification is the source of happiness where we fulfill our human motivations. Applying gamification to the product is likely to affect users' positive psychology and make them motivated and more engaged.

2.2 What Is a Game?

Unarguably, games are a form of play. However, games provide an environment in which game players can learn about themselves and interact with other people and develop certain types of social skills. Games also provide an environment in which one can develop a variety of thinking and problem-solving skills that are useful in both nongame and game contexts to gain mental maturity.

Games keep the users highly engaged in carrying out thought processes and behaviors in a new environment. Very few people find mundane tasks something interesting, but through gameplay, games might or might not enhance the present level of knowledge and awareness of the user, but they can give them a sense of mastery and social motivation to connect with people. Game is widely defined as "a structured form of the play, generally undertaken for enjoyment and often used as an educational tool."

Games make concepts more palatable and supply users with a platform for their creative thoughts to bounce around. Games encourage creative behavior and divergent thought (Fuscard 2001) and are excellent icebreakers. Games will often act as learning triggers inducing lively discussion on learning concepts among users following gameplay. As pedagogical models, games are extremely useful—they can enliven topics and are especially effective for dealing with problem-solving and key concepts. Research shows that "games have a special role in building learners' self- confidence" and "they can reduce the gap between quicker and slower learners" (Fuscard 2001).

A game can be thought of as a model. Let's take Monopoly as an example. In this game, one buys and sells property, invests in houses and hotels on a property,

and travels around the game board. Movement is determined by rolling a pair of dice, and various random events occur when you're playing piece lands on certain board locations. The game and its rules can be thought of as a model; playing the game is doing a simulation based on the model.

2.3   What Is Game Design?

In the most general term, game design is the model behind the game. Game design is the process of applying aesthetics and designs to make a game for an entertainment or for experimental or educational purposes (LeBlanc 2004).

Game design develops rules, challenges, and goals to define, for example, a board game, casino game, card game, dice game, sport, video game, role-playing game, and simulation game that generates desired interactions among players.

Game design is also the part of the game's development from the idea to its final form. Usually, the development process is the iterative process, with recurring phases of testing and revision. During revision, additional design or redesign might be required.

2.4   What Is Gamification Design?

Gamification design is a different kind of experience. The concept of gamification started to gain widespread interest and a more research-oriented following in mid-2010 when companies began using gamification to describe their behavior platforms.

At the heart of gamification lies "participation and reward" system. Businesses apply gamification to drive required user behaviors that are beneficial to their brands. It enables businesses to adapt to different user motivations and behaviors. One common approach of gamification is to enhance engagement by rewarding users who achieve desired tasks.

Rewards like points and badges are used for elevating the status by displaying the expertise, accomplishments, and talent of the users. Competition is also a technique used in gamification. It is a strong tool to motivate better performance, drive business results, and generate a competitive edge. Gamification can be used both in customer-facing apps and employee-facing apps in the company's business model.

Here's a simple model of gamification:

- **Goals**

Setting the goals takes precedence to apply gamification. Sometimes, the purpose is to increase user engagement so that they gain awareness of the platform or app. Or you can lead them in a certain direction using gamification.

- **Measurements**

Once a goal is selected, think about the actions that can be tied to it. For example, if the aim was to get more engagement, then an increased number of contributions in a community can be its metric.

- **Rewards**

When the goal is to get more engagement, the measurement will be the increase in online content, and then the activity needs to be rewarded. Now the reward must be publicly acknowledged, and it must be consistent.

2.5   What Is not Gamification Design?

Gamification belongs to the larger thought process of game thinking that involves a methodology that elaborates the means to engage and motivate users. For starters, it is not a game. The main purpose of a game is to entertain, whereas gamification is about motivating the user to take on a desired behavior.

- It is not just fun but a user engagement tool.
- It is not just simulation but use of game elements in different contexts.
- It is not restricted to any field but caters all.
- It is not a competition but building collaboration among players.
- It is not about points and leaderboards but used as a motivational tool.
- It is not designed for youngsters only but people of all age groups.
- It doesn't need heavy graphics to engage users.
- It doesn't work for everyone but aims right for a lot of people.
- It doesn't require huge number of resources but a handful of cohesive ideas.

2.6   Games for Learning

Games for learning are the games where players are taught to do something, by playing a real game. Games for learning are also called educational games or teaching games. These games are designed to help people learn certain subjects, concepts, reinforce development, develop knowledge about a historical culture or event, or help them in learning the skill while playing. Games for learning types include board games, card games, and video games. As parents, educators, business leaders, and governments realize psychological requirements and advantages of the games for learning, this educational approach has become mainstream. Games for learning are interactive play that teach learners rules, goals, problem-solving, adaptation, and interaction, all presented like a story. They satisfy their basic need to learn by offering passion involvement, enjoyment, motivation, structure,

adrenaline, ego gratification, emotion, and social interaction in the game itself while learning occurs.

2.7   Serious Games

Serious games are those developed for a primary purpose other than pure fun or entertainment. The serious games are applied as a comprehensive term used for any game-based initiative that holds an additional, serious agenda. Training and development is a critical topic for developed and highly motivated employees which can create a difference between an organization that succeeds and one that fails.

There are various common features shared by all games that reinforce the learning goal in an engaging manner. These attributes or features include the following (Shantanu 2012):
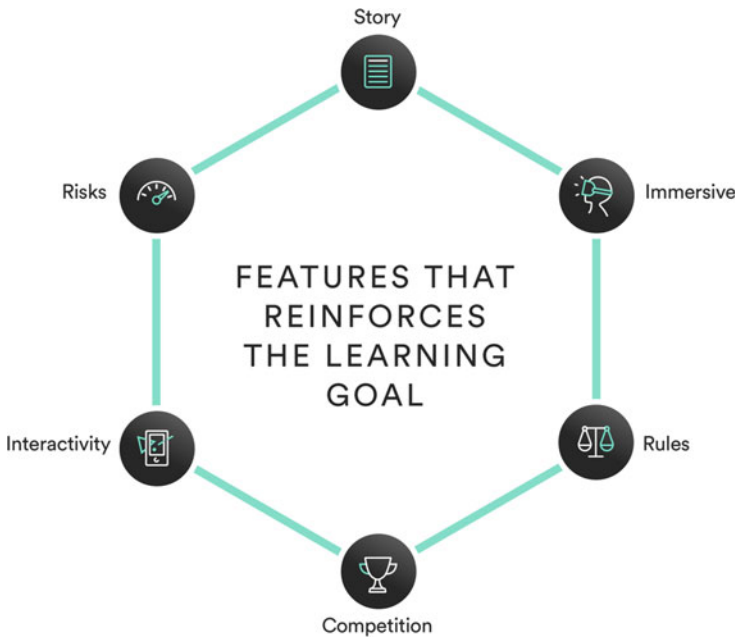
- **Story**: A good serious game is equipped with a gripping storyline. When developing a serious game, the game may be used for reinforcing the company's values and an added level of learning.

- **Game interactivity and mechanics**: Game mechanics are tools that make game functional. These provide interactivity elements that keep learner involves throughout the entire process.
- **Rules**: They provide the basic framework and components that deliver sub-liminally a learning goal. When a player breaks any rule in a serious fame, he or she will incur a punishment or penalty, which eventually could transform their behavior.
- **Immersive graphical setting**: Some of the most popular and successful serious games are found to be graphically unimpressive. For casual, fun-seeking gamers, the gameplay wins over how appealing it is. A serious game can be made without immersive graphics, since the primary focus is learning outcome.
- **Challenge and competition**: Serious games contain elements of challenge. At its easiest form, the player's key challenge is to beat the higher score. Serious games having social element enable learners to challenge one another, which is a friendly competition element that boosts engagement.
- **Risks and consequences**: Serious games offer a risk-free environment for practicing necessary skills. This is one of the major benefits for many industries including medical, defense, and aerospace. In these industries, there is always high failure cost, implying virtual simulations here as a practical necessity.

2.8   Simulation Game

A simulation is the virtual presentation of something taken from the real world, such as training, analysis, and prediction (e.g., a medical simulation). This is often difficult to differentiate it from a serious game, as they look quite similar. The difference is that the simulation doesn't generally require gameplay elements in order to work and meet its designed intent. It exists to enable users practice a real-world activity in a secure environment.

Simulation takes many forms; physical like role-playing games, digital such as fully computer-based, or blended, where users have both as in mixed reality (MR). Where the teaching game is all about teaching players how to do something, the stimulator provides players a virtual way to practice something.

2.9   Core Idea with Gamification Design

- **Intrinsic and extrinsic motivation**

Effective gamification comes from the understanding of fundamental distinction between intrinsic and extrinsic motivational triggers. Extrinsic rewards are not about the things you are doing or the tasks you intend to achieve. They are the

rewards that come from the outside, a set of design patterns, mechanics, and techniques that expects to tickle users' motivation, curiosity, and behaviors. These rewards are expected, tangible, and arguably gimmicky. They are the distraction carrot, the trick, and treat. These are colorful yet eventually meaningless on its own (Fuchs et al. 2014).

- **Content**: Quests, missions, virtual goods …
- **Progress**: Levels, scores, points …
- **Achievements**: Awards, trophies, badges …
- **Reputation**: Leaderboards, rankings, ratings …

As prepackaged, nearly developed gamification platforms are being developed, the side effects of emphasizing on extrinsic rewards have made more and more visible. The prevalence of the shortsighted motivational mechanics implies that users will just focus on the task to achieve instead of creative solution to explore. Extrinsic rewards make users the spectator of the progress instead of autonomous agents surfing the learning curve. They tend to increase stakes, thus lead to stress. They belittle the goals by applying a tangible value to them, triggering undesired behaviors sometimes. Extrinsic motivation and rewards in gamification settings turn the games into work, instead of the reverse.

On the other hand, intrinsic rewards arise from within. They tap into the higher motivators as well as positive emotions such as beating challenges, the thrill of the autonomy, self-driven learning, belonging, mastery, power, surprise, curiosity, social validation, peer recognition of the internal accomplishments, and renewed interest. The gist is in providing a sense of the internal progress that leads to a meaningful journey for the players, no matter what type of players they are or what kind of fun they are experiencing (Horachek 2014).

An important component of the design process lies in the engagement and feedback cycle, not as epileptic, flashy, and controlling scorecards, but as the documentation of internal accomplishments that rely on the great game in the first place. Surely, players can win trophies and awards and share them on social media, but the actual sense of the progress comes from within, from informational feedback validating the essential elements of mastery, drive, and purpose.

There is one important conflict between an evidence-based gamification design ideas and simplistic views of the motivational theory: a slavish dependence on intrinsic motivation is unlikely to generate large-scale behavioral change where challenges are difficult. The introduction of cautiously chosen extrinsic rewards, developed around a design that signifies intrinsic motivational states, is the strongest design model to have today.

2.10   Common Gamification Techniques

Though there are several gamification techniques, the most common gamification techniques include (Burke 2012)

- **Engagement curve**: Ensuring engagement in the entire game flow,
- **Achievements**: Including milestones,
- **Anticipation**: Using techniques like dramatic tension,
- **Character**: Built with history and personality,
- **Subculture**: Game's own vocabulary and social conventions,
- **Goals**: A series of escalating goals,
- **Rewards**: Ensuring reward actions for memory or skill at each level,
- **Rules**: Constrain play,
- **Stats**: Providing players gameplay stats,
- **Quests**: Mission within a game,
- **Role playing**: Players to play various roles, and
- **Real world**: Integration of game with the real world using augmented reality.

2.11   Gamification Used for Different Purposes

- **Learning**

Gamification in learning lets the users experience fun during the learning process at the same time if engagement level is good. Gamification is heavily used to meet the learning needs in corporate sectors including induction and orientation, product sales, soft skills, customer support, compliance, and awareness creation. The gamification strategies use rewards for the players who achieve desired tasks, to engage them. Types of these rewards include badges, points, levels, progress bar filling, and virtual currency. Gamification drives very strong behavioral change if combined with the scientific principles of spaced repetition and repeated retrieval (Burke 2012).

- **Marketing**

For marketers, gamification is the means to stand out and utilize that emotional high of victory to close deal on selling their product or a service. Using gamification to boost the amount of time a buyer spends in your app can enhance their engagement level with the brand (Hamari 2015). This goes a long way toward influencing their buying decisions in future.

- **Loyalty**

Gamification is used across loyalty in various ways, for instance, in retention (McGonigal 2011). Gamification plays a key role in ensuring customers to come back on continuous basis. Along with points for buying, it can provide users with a sense of competition and achievement to keep them engaged and let business gain

real retention benefits. For instance, frequent flyer programs with status tiers and related perks are the example to retain customers and their loyalty. Another example is driving customer behaviors required by businesses, be it signing up for newsletter, filling registration form, taking polls, creating referrals, or influencing word of mouth.

Gamification is everywhere

- **Internet**

Games and their popularity online are a driver of the adoption of more elements of gamification in a lot of Internet pursuits. Another key driver is the rapid penetration of social media, where status and rewards elements are included in implicit and explicit shapes in people's interactions for their engagement in across online communities. Game elements as well as competition are interspersed across the entire platforms that make social networks (Lazzaro 2004).

- **Mobile**

The mobile age of today has greatly expanded opportunities for gamification. Integration with the social media means that motivational experiences are shared with acquaintances, friends, and co-workers. A smartphone-carrying consumer or employee might be drawn into the gamified experience anytime, anywhere (Kleinberg 2011).

- **Big data**

The use of big data and gamification is rapidly gaining new uses with the high social media usage, mobile use, and the rise of wearable computing. Combining big data with gamification to motivate employees, boost their performance, drive business results, and generate a competitive advantage has become a common practice (Mangalindan 2010).

- **Augmented reality**

Augmented Reality (AR) is the addition of a layer of digital media that enhances the real world, offering benefits to gamification in education and learning. Educators are using AR techniques like air-tagging and geotagging to enable learners find additional digital information in real locations using smartphones on field trips or scavenger hunts, giving learners a real sense of discovery. AR is also used to visualize concepts or diagrams. AR also increases the potential for the conversational learning as children learn better in AR educational tools (Mangalindan 2010).

2.12   The Benefits

The topmost benefits of gamification are the following:
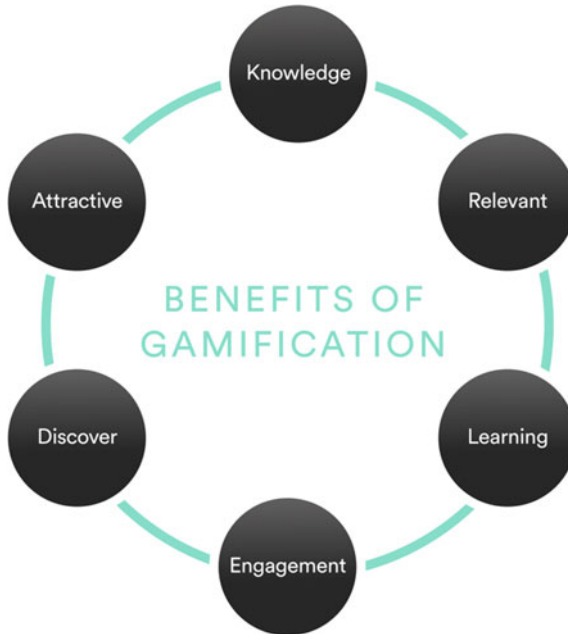
- It leads to higher learner engagement.
- It makes learning fun and interactive.
- It improves retention and knowledge absorption.
- It provides academic and corporate learners to see and experience real-world applications.
- It enhances an overall learning experience for all age groups across different industries.
- It provides synergy outcomes when combined with big data, AR, and other technologies.

2.13   The Criticism

Much of the research community's criticisms dismiss the idea of gamification as a fad, disparaging its use of game concepts, suggesting its methods are quite shallow, or believing its sole use is just for marketing. It can be thought that gamification creates an artificial sense of achievement and can also encourage unintended behavior for rewards.

But what most of the gamification's detractors ignore is that industry is coming up with tangible results. Tens of millions of users use gamification every day to improve their lives, workplaces, and bottom lines. Because of its unprecedented efficacy, the gamification has embarked upon a profitable high-growth vertical, rapidly adding jobs, expanding itself internationally, and changing the world for better.

2.14   Conclusion

Gamified thinking is not a miracle cure for all your product's woes. It's not possible to take a lousy process and sprinkle on some game elements and make it fantastic. Similarly, you cannot become so reliant on gamified ideas that you obscure the original purpose of the product. Setting expectations of what you can and what you cannot achieve through gamification are things you need to do early in a project if you want that project to succeed. Gamification is not game design. The objective is to enhance an existing system and not to create a game. You're building a gamification feature into a design, not the other way around. Bad or poorly received gamification features may indeed deter your users from getting involved with the task in hand. Your objective is to engage users, not put them off. It's important to take an ethical approach to gamified thinking and imagine yourself on the receiving end of whatever you're creating.

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Chapter 3
Problems with Applying Gamified Thinking into a Product

Abstract As we know gamification is the process of integrating or applying the aspects and elements of games into mundane tasks and product development processes. In this digital age, gamification has become an exciting concept in the business world. An increasing number of businesses and teams are applying gamified thinking in their products. However, it seems that people's expectation of this application can become unrealistic sometimes. Gamified thinking is not the miracle cure for all your product's woes. It is unrealistic to adopt a lousy process, add game elements, and end up with a fantastic product. One should not become much reliant on gamified thinking that one obscures the primary purpose of the product. Setting expectations and knowing the problems with applying gamified thinking are important for the projects to succeed, which make the gist of this chapter.

Keywords Gamify · Shallow gamification · Game designer · Games are cool—gamification is not · Juicy feedback · Gamification problems · Ethical problems · Algorithms · Big data · Real time · Performance

3.1 Introduction

A critical aspect of a product to be successful is the excellence of its user-centered design. The User eXperience (UX) is the process of developing products that provide personally relevant and meaningful experiences for the users. This entails the careful design of the product's usability and value the customers will get from using it.

Today, gamification is heavily being used in design as it is believed to help solve several problems in the user experience design of the products. The suitable use of gamification and carefully selected game elements and mechanics can become a

useful tool for user experience designers to gain increased user engagement of the product and higher conversion rates (Byron and Leighton 2009).

Using gamification for the user experience design of a product, we have seen that gamification is usually mistaken as game design. However, these terms are not the same; even more, these are opposite in a few aspects. As known, the word gamification means the technique of applying game-like elements: mechanics, dynamics, and components into a nongame setting, like applications and websites.

For instance, if you want your users to interact more via your application, you can consider adding a game element such as challenge so the users can be challenged to check-in daily every week and be rewarded if they do so. The point is that users like having a clear-cut goal and even more to get rewards after doing that. Hence, any such challenge has a greater chance to get noticed among the users. In this way, a gamification designer can influence the behavior of the users and motivate them as players to do the required actions through game elements like a challenge and reward.

3.2 Do You Need to Gamify?

Various reasons are attributed to why people are increasingly using gamification. First, a gamification design adds an element of motivation to, for example, a product, service, application, and website. Users enjoy the engagement, challenges as well as competitive spirit much like they do in games; hence, they are encouraged to go back. Moreover, the game mechanics are the great motivators for the users. These elements are connected with tasks and promise rewards to those who achieve those tasks. The excitement and curiosity drive the users to keep performing different tasks and spend more time on the website or on the app.

Gamification is now a mainstream technique on the path of proving its reliability as an effective and successful product design method. However, its popularity is growing rapidly, and hence it has good chances to be the leading approach in near future with its problems being neglected or overlooked.

Arguably, gamification has become one of the key design approaches today. Many designers have captured the hyped and are actively using this technique in different projects. Hence, many users might already have experienced the interaction with gamified products that mean they expect the similar from yours (McGonigal 2011).
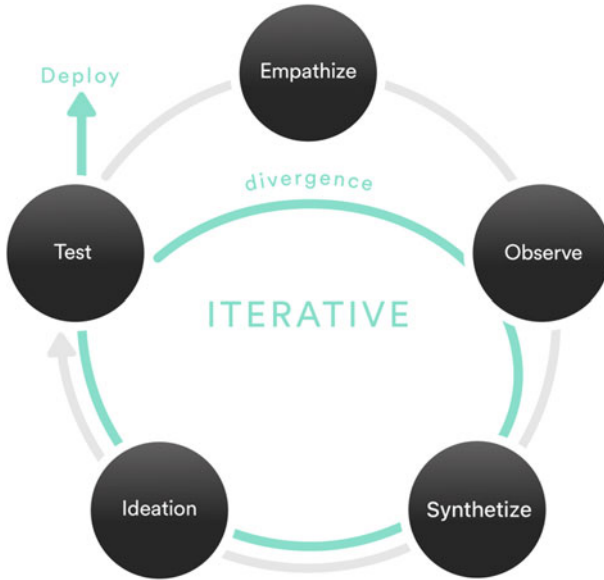
The above-illustrated design process inspired by Van Grove (2011) is applicable to the gamification as it is applicable to other aspects of design. Experts say that it is not about the "gamifying"; rather, it is about saving costs, driving revenue, and making users more efficient.

We know that gamification is about taking certain aspects of gaming and using them to the task to make it more engaging. The goal is not to make the task a game completely. In fact, the idea for successful planning is to keep things as simple as possible. Similarly, you need to keep the addition of elements of gamification to a subtle level because by doing that, the engagement enters without the user's knowing the point that any kind of game is going on.

For instance, some social media platforms incorporate a progress bar to drive its users to complete their personal profiles. This is a very basic thing to implement. It is not likely that making a progress bar is based on completing the increasingly tough levels of the shoot them up game, which would be as effective. This is because the users enter using the social media network in a way different from how they would enter a game that calls for shooting the things appearing in the player's field of view. A clear vision or goal is needed for any gamification design. It is important to keep the purpose of the design's use firmly in mind.

Keep in mind that you cannot just get some random game mechanics and add them to your product or application if you want your gamification idea to succeed. There is a place for badges, points, and leaderboards (PBLs), but it is not everywhere. You must select the right tool for the right job and often this will need a trial and error method. That implies knowing your market inside out, testing the design

again and again before rolling it out, and not to lose sight of the fact that you are playing another game with high stakes in the process of producing a great design without risking your and its own reputation (Huotari and Hamari 2012).

3.3   Shallow Gamification

According to many game design professionals, a poor gamification design is one of the more prominent failings of several gamified applications today. The emphasis is on the prominent game mechanics like badges, points, and leaderboards, instead of subtler and more vital game design elements like neutralizing competition and balancing collaboration or explaining a meaningful game economy.

Poor gamification features can surely prevent users from getting engaged in the product or task in hand. Your goal is to engage users, not annoy them. For example, social media platforms hold a prominent professional nature and look. With a slight visualizing, you can picture the potential users as being corporate executives, looking up one another to gain a thorough understanding of who each is and what each of them can do. It would be the last place for you to add a glitzy-looking element. It is not that these users are deadly serious and detest leisure; it is just that there is a place and time for everything, and irrespective of the point that behaviors toward gamification shape the generation gap, the corporate people are still likely to be serious-minded for the millennial generations to come. Therefore, keep in mind who you are really designing for. To keep the testing features prior to releasing that may help to achieve this, the real tracking of success usually needs feedback from the whole user base (Hamari et al. 2014).

The idea of gamification development should be interpreted in the historical context to determine why gamification mechanics don't eventually result in a great design.

There are several case studies on gamification that show and pledge a great influence on the world; however, there are also many cases of poor practice, numerous misconceptions, imperfect application, and failed attempts.

Many designers believe that if you add points or badges in something boring, that once-boring product will become exciting instantly. Indeed, that is also what many gamification platforms specialize in, i.e., adding points, badges, and leaderboards (PBLs) into different products in a scalable manner. And as an outcome, many of the less informed people who are curious about gamification begin to believe that sum total of gamification philosophy and methodology is the plain process of adding points, badges, and leaderboards to the products. This indeed makes them believe that the gamification is a "shallow" fad and not much influential (Fuchs 2012).

This has also faced a backlash from the game development community since they claim that the gamification spoils the true intrinsic essence to good gaming. And who is going to blame them? Traveling companies, for instance, seems nothing more than badges, points, and leaderboards based on the places visited; a shoe

brand may follow the same thing in the context of running. Is this deep as gamification stands for?

Indeed, PBLs have an important position in game design and that's why they are added in many games. They can motivate people to do certain actions. However, gamification is much more than PBLs. Many experts having limited exposure just know how to use PBLs mechanics and even these sometimes create value, majority of them fully miss the point of engaging users.

If you ask a professional gamer about the elements and mechanics that add engagement in a game, they might not disclose the PBLs, to intact the authenticity. They play it since there are elements of strategy, since it's a nice way to hang out with friends, or they like to challenge themselves. The badges and points are usually added as additional bonus that is good to have based on the context. This differentiates extrinsic motivation, where users engaged due to a goal or reward, from intrinsic motivation, where the task itself is exciting and fun, with or without a reward.

Games are not essentially engaging due to flashy animations or high-quality aesthetics. There are several unpopular, poor-selling games having state-of-the-art high-resolution graphics, and there are also the games having very basic or even zero graphics but have a bigger community of addicted players (Herger 2011).

Clearly, games are far more than "meet the eye" aspect. Unfortunately, many people working with gamification assume that using mainstream game mechanics, which are PBLs, will automatically turn the product or user experience engaging and exciting. However, how do you make a successful gamification design is not only what you put in, but it is also when, how, and most importantly, why.

3.4   Do You Need to Be a Game Designer to Make a Gamification?

Game designers are usually considered the true game engagement experts, and a great game designer is required to create an effective gamification experience. However, a bad game designer is certainly not needed in any case. Do you know the difference between a good game designer and a bad game designer? Knowing this difference is important to create a meaningful user experience by applying gamification to your product or application (Dille and Platten 2016).

To understand the gist of good gamification design, let's see the example of how an inexperienced game designer may design a game. While designing a game, a game designer might start thinking like:

> *So, what game elements* and game mechanics should I add? Well, indeed we want monsters in the game as well as swords, so where should all it be placed? What about the crops that players would fertilize? How about the birds showing enough attitude? I am sure that it is going to be admired and make an impact.
>
> *(It's an assumed general thinking perspective)*

It is evident from the explanation above that a game may have all the right ingredients but still be too dull if users' motivation is neglected. If you consider this, every single game available in the market has what we call the game elements and game mechanics in them but could still be taken as incredibly boring as well as financial losers. Just a few well-designed games are taken as engaging and addictive.

Now let's see what a more thoughtful designer does in the same situation. Rather than starting what game mechanics and game elements to use, a good game designer starts by thinking:

So, how do I want people to feel? Do I want them to get an inspiration? Do I want to make them feel proud? Should they be effective or productive? What is my objective for their desired experience?

Once the Game Designer Understands How the User Wants to Feel Intrinsically, He or She Starts to Think

So, what type of game mechanics and elements can help me achieve my objectives of enduring the users feel this way?

The solution might lie in swords, or plants, or maybe word puzzle games. The point is that game elements are only the means to an end, rather than an end. Game elements are just there to pull and push users' core behavioral drives.

3.5   Games Are Cool—Gamification Is Not

As mentioned quite a few times already, gamification is the application of game elements to nongames. In simpler terms, the gamified experiences are generally otherwise applied to monotonous stuff that is decorated with game elements such as achievements, badges, and leaderboards. What gamified products typically lack are the fundamental mechanics of games that make the user experience intrinsically fun. Unluckily, all badges, achievements, points, trophies, and leaderboards in the world will not ever make up for an unexciting core experience.

Surely, the games are fun, but they also engage the users at psychophysiological level that creates a positive behavioral change unlike any other medium. It's not just games and fun, it's a science, even more comprehensive than the idea of gamification.

It's a myth that games are just for fun. The current studies have demonstrated that games significantly enable behavioral change (Chou 2015):
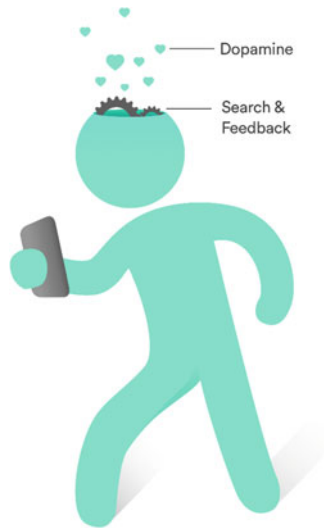
- Pleasure is related to the emission of dopamine in the brain. After deciding and getting feedback that the decision was correct, the dopamine releases and urges the brain to try to reap that behavior.
- Games are impressive at providing feedback for progress. Elements such as accumulating points, progress in the story, sound effects, visual success indicators, social recognition, animations, all help push the release of dopamine.
- Through feedback, the neuronal circuits get stronger, reinforcing the wish for the activity that led to dopamine response. It may sound like addiction, but games can surely be addictive.
- With thorough feedback, the wish to continue transcends the external rewards, which becomes internal since the brain wants another release of endorphins. This is the foundation for a long-term behavioral change.

In games, the objective to use a game is to get a learning goal or skill. The game is embedded in the learning journey. In gamification, on the other hand, it's a pedagogical system. The whole learning journey is developed around the idea of playing a game, but not playing a game itself. It implies creating a game out of something that is not.

One of the key problems with gamification is that it incentivizes the winning over other goals like getting extrinsic and intrinsic rewards. For business training and development, you don't want employees who know how to ace a test but don't essentially know what they've been taught. Gamification is an effective tool for making users engaged, but it must be implemented with great care, monitored on a continuous basis and developed to ensure performance and learning are the required outcomes.

3.6   Dull or Juicy Game Feel

The potential to make a "juicy" product within learning, which is more satisfying and interactive, is clearly desirable because it increases the chance of fulfilling the central objective of the product—to aid learning. A lifeless product will fail to engage the learner with the content and doing tasks related to it. In content gamification, create the "juicy" feedback. Feedback is the important component in any kind of content gamification since feedback informs the learner of the level of the correctness of his or her actions while providing guidance, immersion, and interest simultaneously. Juicy feedback is the concept of designing for the visceral reactions in learners so they can experience the emotions (Werbach and Hunter 2012). A juicy experience is engaging from the time you start till the time you end.

3.7   Gamification Problems

While applying gamification, it must be kept in mind that one size doesn't fit all. The most frustrating aspect of gamification is that lightning doesn't strike again. A lot of designers have made a game that was very successful in one setting, just to turn around and have it totally flopped in another. This doesn't imply that game was poorly made, but it means that it was poorly executed. You might have the most aesthetically beautiful and intuitive game in the market, but if it doesn't match with objective of your training, it is not going to engage learners with the content (Kapp et al. 2013).

It is to be kept in mind that the learners are customers and the content is the product. If you want your product to work in your favor, you would need a market research. By knowing what engages and motivates your target market, you can take the information into development. This process also lets you understand if the gamified product will be effective or not.

3.8   Ethical Problems

We can see that businesses of all kinds are exploiting the potential of gamification to motivate learning and behavior change, whether it's about getting customers more loyal and engaged with their products, brands, or messages, or motivating the employees to perform better at service, sales, training, and collaboration.

It might be tempting to see gamification as a means to bring additional layers of control in the workplace or try and fool employees to do more than they are expected to. That's not a good idea in ethical terms. First, and most importantly, it is not ethical, even if one may argue seeing who can manipulate the users for the most profit could itself be boasted as a game at personal cocktail parties. However,

despite the rights and wrongs of "conning" or "persuading" people into doing the things, users would work out fast when they are being forced or manipulated into the things, anyway. Then, they would struggle to withdraw the gamified environment and such offending design would become. Not just people tend to feel humiliated being viewed as pawns or rats, but they would also tend to express their dislike regarding the design in a very public manner (Lowry et al. 2013).

It is of utmost importance to use an ethical approach to the gamification and think yourself on the user end of what you are creating. Especially when you have a user base who can discuss the design amongst themselves, and also tell the world about it, the last thing you would want to do is to try to outsmart them this way. Once the user feels used, patronized or tricked, it might be just a matter of time prior to the first reviews appear. Hence, if your design embraces their intelligence, it would have a better chance to win their loyalty as well as more users.

3.9 Do Not Forget Algorithms and Big Data

Studies have shown that by capturing the big data on user activity and using this data to make a more engaging experience, businesses are able to engage and motivate their employees with greater precision. Combining the big data with gamification is a very powerful tool for driving business results, motivating better performance, and generating a competitive advantage.

By taking the big data that employees are generating as they interact with the business systems and using that data to motivate better performance and drive a hard return of investment (ROI) (Herger 2011).

Much of the focus on gamification has been on its use for motivating the employees, but gamification applies just as eloquently to the customers, students, and business professionals. With each action they take, users are raising their hands and telling you something about their interests, their activity, and even how they prefer to spend their time. Smart companies can use this activity data to motivate customers to engage, contribute, participate, share, purchase, and be more loyal.

3.10 How Can Real-Time Use of Gamification Drive
      Performance or Not?

Imagine a basketball coach who skids along the court, following his team as they invest all their body strength and skills to fight off opponents' scores, and keep up their offensive within the team. The coach throws out his feedback in real time, so his players can fix their mistakes on the spot. If his point guard is taking too many shots in the first quarter, his coach will have him back on the right track by the end of the second.

Performance management is generally a good idea: set goals and measure their achievement. The problem is that most performance management practices involve setting of annual goals, which soon become stale. In addition, communication with employees about performance is marred by the practice of ranking employee performance—which people (naturally, of course) find threatening, confrontational, and discouraging (Kapp et al. 2013).

Gamification brings this dynamic to your employees' performance. If the system is modern, the feedback is given on the spot, by showing Key Performance Indicator (KPI) and personalized benchmarks and goals within the gamification application, so employees can rectify flaws in real time, instead of through retroactive feedback that is weeks or months late.

3.11   Conclusion

Gamification is a popular concept, but it is not a magic wand. Ineffective products are not going to be accepted just because you added some gamification. You can achieve limited outcomes through gamification and being a product developer, you don't want your product to become a game with a remote secondary benefit; gamification design is not the gaming design. Gamification designers must focus on what they can expect realistically to achieve in the design process, considering cons of gamification on mind, be very cautious that they cannot make a pig in a dress anything but a pig, no matter how much gamification is done. Also, always keep in mind that the users are able to see through trickery. It may take just few bad reviews to earn a questionable title of cynical exploiter rather than what you want it to be, a successful investment.

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Chapter 4
Games Are Learning Systems

Abstract The basis of creating a learning system is quite similar to game-based learning. When you get right down to it, the objectives of both are almost the same. Serious games, specifically, and gamification both try to solve a problem, promote, and motivate learning by using game-based techniques and thinking. This is true but there are certain differences and subtleties that designers must know before going forward with gamified or game-based learning systems. This chapter highlights the role of games as learning systems, traditional and pedagogical learning models in games, the benefits of gamification through learning as well as pros and cons of games as learning systems. Lastly, the application of gamification to an actual learning product is also part of the chapter.

4.1 Introduction

Arguably, gamification transforms the learning process in a game-like context, and game-based-learning defines game as a part of the learning process. Karl Kapp, the writer of the book "The Gamification of Learning and instruction" states that (Timmers and Veldkamp 2011):

> When you get right down to it, the goals of both are relatively the same. Serious games and gamification are both trying to solve a problem, motivate, and promote learning using game-based thinking and techniques.

Gamification and game-based learning are slowly but surely becoming the fundamental designs in our new digital learning environments. It is of no surprise that they represent everything that is motivating, from the intrinsic rewards to

teamwork to occasional external rewards to collegial support once the required task is completed or an action or behavior is exhibited. The blend of these advantages successfully develops the skills and knowledge that positively affect productivity.

It is to be remembered that when considering the gameplay as the asset in your blended learning event, people desire to play the game having educational content, i.e., they don't play to win, but to learn and achieve. Winning badges, for instance, is fun and exciting, but not the required end goal. Learners strive to get intrinsic motivation, an internal sense of success or achievement that arises from successfully completing a complex task or solving a difficult problem. They want the real-world applications and positive outcome coming from them. Gamification and game-based learning should as mentioned be carefully designed, drawing on a positive psychology of the play and its usefulness as a learning strategy.

4.2   Games Are Learning Systems

As told, game-based learning is the integration of the actual games into the learning process, typically to teach a specific skill or get a specific objective achieved. This approach gives the learners an opportunity to be engaged in the learning process and to have excitement and fun while doing so. Gamification, in the blended learning context, is the idea of applying game elements to nongame activities for promoting the participation and motivation of users. The goal of game thinking used as in learning system is to inspire the users to interact and participate with one another in a goal or an activity-oriented community (Van Eck 2006).

Games as a learning system involve using the game-like interactions, structures, or simulation strategies to support the pedagogical goals and results. When you use the game or game design as a part of your learning materials, you are in the game-based learning. A general example of this includes using sports games to teach teamwork with other social skills. There are surely more times we are learning via game for which we give credit.

Though definition differs, the games offer visual information to the players (learners), accept their inputs, and use a collection of rules. Games are complex, need collaboration with all stakeholders and based on developing insights, values and knowledge about the end users. Having diverse goals, the games have become complex learning systems.

4.3   Playing Is Learning

Using games for learning and teaching is not a new concept. There is much research that supports the power of play in knowledge and skill development. Playing is proven to enhance memory, cognitive function, and collaboration, all among a wide range of positive outcomes (Squire 2008).

Games and play are effective learning environments not just because that they are fun but because they
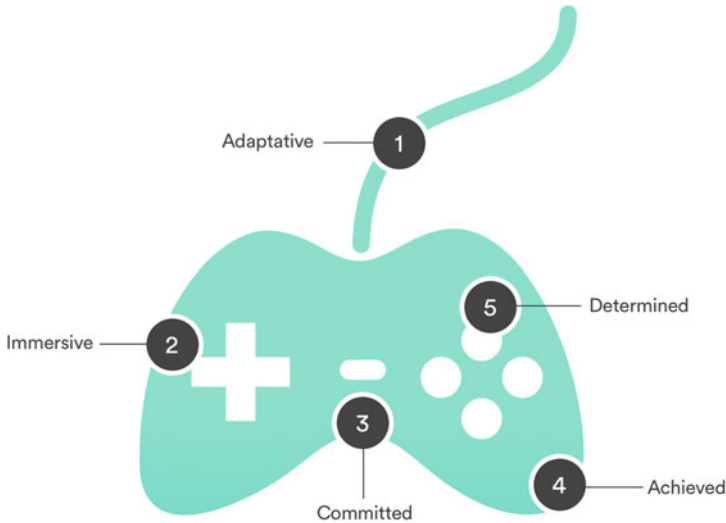
- Adapt to every player's individuality,
- Are immersive,
- Engage with a social network,
- Clear in terms of goals, and
- Require the learners/players to make important decisions on a frequent basis.

Playing embodies a number of attributes related to how people learn: games are experiential and social. They require the learners to recall their prior learning and build new understanding. Having success while playing a game is based on problem-solving.

Another important aspect of games and playing is the community that is developed around them. Communities of the users share their ideas and group-problem identification and problem-solving, not to mention a good way of socializing occurs. In fact, the explanation of a game community reflects the definition of an academic community of practice. The community thrives on a culture of learning; every player is involved in mutual effort of understanding. Group members also bring different expertise to this community and individual members are recognized and valued for their contributions that help to develop further since the group keeps advancing its collective skills and knowledge.

4.4 How to Understand Games for Learning?

Though games are effective learning environments, not all games are educational and effective. In a similar way, not all games are ideal for all learners and for all learning outcomes. The key is how the games are used. Just adding the games to

learning content or curriculum doesn't mean that they are integrated within it. Think of how best you can add games to the learning toolset, blending them with a number of other activities. This integration needs an understanding of the adopted medium and its coherence with the subject, the instructional strategy, intended outcome, and the students' learning style (Squire 2005).

You can integrate games into education via a range of approaches like letting students create their own games, incorporating the commercial games into the curriculum, or analyzing the games to determine what is wrong or lacking it, which enables students to determine not only the subject but how the games are structured.

Gamification and game-based learning, while structured in a different way, share elements that drive learning. For instance, they involve, motivate, challenge the players, ask them to apply prior knowledge to address incremental complexity, respond to the learners' need for intrinsic and extrinsic rewards as well as hone competencies to apply beyond the learning environment.

In terms of game-based learning's contribution in the blended learning, experts say that it
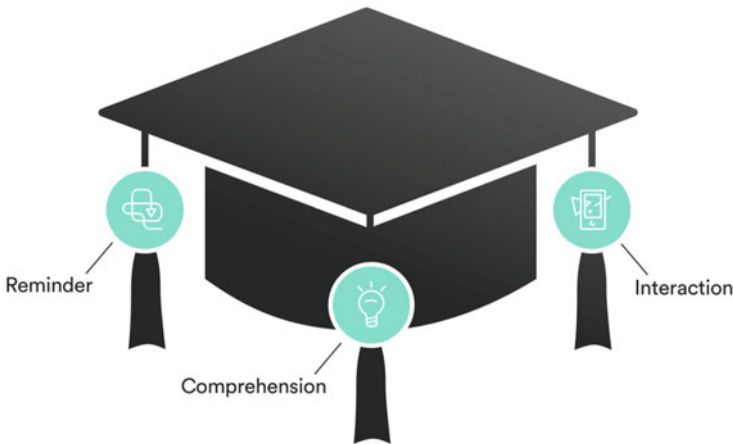
- Reminds the participants of what they learned and signifies their achievements along the learning journey,
- Can make complicated concepts easier to comprehend, and
- Offers activities that let the participants to interact and demonstrate the topics they are learning.

In addition, a well-structured and carefully executed game-based learning application incorporates the layered strategies that engage the learners in multifaceted manners. Serious games reflect the evolution of play in learning. They are the kinds of gamification and game-based learning instances that do what was explained earlier, i.e., build or improve the skills while still retaining fun (Olimpo et al. 2010). The term serious games also seem to attract adult learners (e.g., employees) as they

don't tend to think of this as play and want to apply their higher order skills to the realistic, complex conditions, combined with social collaboration, which is often provided in the game-based learning experience.

4.5   The Benefits of Game-Based Learning
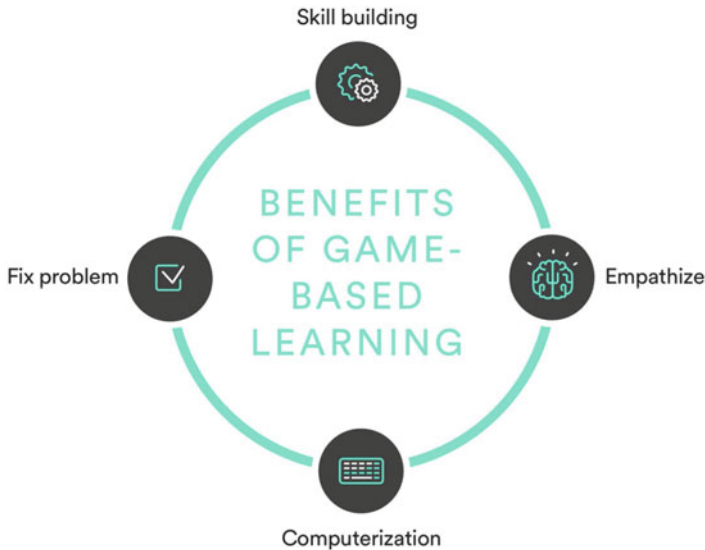
- **Increases learner's memory capacity**

Game designs usually focus on the memorizing power of the players. Players have to remember the aspects of the games to solve the puzzles, memorize critical sequences to achieve task, or track narrative elements to clear the levels.

- **Computer and simulation fluency**

Paying a game on the Internet lets players, specifically children, to gain familiarity with how a computer works. Learning games teach them to use gadgets, not to mention browsing and general computer navigation.

- **Strategic thinking and problem-solving**

Most learning games require players to think fast, as well as using logic to thing beforehand to complete upcoming levels and solve problems.

- **Skill building**

Games for learning help learners with specific skills. For instance, a lot of adventure and mystery games contain maps that players have to read. This builds their map

reason skills as well as practical thinking. All games whether a basic game of tag or a complex board game offers invaluable opportunity for learning to understand and follow rules and directions. Consequences for not listening to and following the rules, such as disqualification, are natural ways children learn the importance of rules and directions. Sharing, taking turns, being a gracious winner or loser, and other important social skills can be taught and practiced through games and play.

4.6 Learning in Schools, Workplace, and Everyday Life

Effective learning takes place when you are completely engaged in what you are doing, whether at school, job, or in any aspect of everyday life. In a similar way, when you want to get the most out of watching a movie or reading a book, giving it your complete focus makes all the difference.

However, when you are learning, it becomes even more important as the activity is not only receptive but also makes all types of demands on memory as well as your understanding.

In schools, one of the biggest challenges for the teachers is to successfully teach big groups of students, all of whom have various personalities, diverse competencies, and learning preferences (Johnson 2005). Game-based learning that blends the subject matter with gameplay is one way of achieving an effective learning. Rewards (like stars or lives gained or lost) are usually closely combined with quick feedback on the choices made or the answers given. This is way more effective than the feedback at the end of the lecture or the following week, by which time any regular student has lost interest. However, game-based learning must be more than just persuading the students that they are playing. It is an error to believe that students only enjoy learning if it is given in a game form. Learning itself is a pleasure when learners are succeeding at it. The power of game-based learning in schools can push the students toward the next level.

Game-based learning is a fairly common component at workplaces, especially for training and development of employees. This is because the learning games produce great results and game-based learning approaches have proven to transform training across all the industries, from retail to human resources to defense, and with the market showing huge growth potential. An increasing number of organizations have never found a better time to unleash game-based learning in their training, learning, and development strategies (Bellotti et al. 2009).

Game-based learning is the key to unlock the maximum engagement from the training content. Rather than subjecting the learners to passive e-learning (learning for the sake of learning), the learning games are more interactive, enjoyable, and hence, more effective.

People involved in high-risk jobs are unable to afford mistakes during their training. Game-based learning or simulations help them learn in a totally risk-free environment. In addition, if training becomes another distraction from the actual work, learning games often deliver bite-sized content in a highly engaging format.

4.7   We Are All Learners and Teachers (and Gamers)

While many of us may not define games or gamification as part of their life, most of us have unknowingly experienced it, probably every single day.

Whether you see it or not, a good percentage of the apps installed in your smartphones use gamification as a technique to keep you always hooked. Think of notifications, rewards, points, and competition among your friends. But game thinking reaches far beyond the smartphones. Your local grocery store has a rewards program, your gym offers a progression scheme, and your nearest coffee shop offers loyalty points. These all are examples of gamification.

From the discussion above, we can say that game-based learning or learning via gamification works in any industry and setting. Give people tracking abilities, challenges, and rewards, and are going to come back for more. Moreover, when it comes to the corporate training, we saw that so many training and development practitioners are now adopting game-based techniques as part of their blended learning solutions (Barab et al. 2009).

It implies that the business world is far ahead of the academic industry with proven success using gamification designs and game-based learning, and we all are learners, teachers, and gamers at the same time, experiencing the game-based experience somehow, somewhere.

4.8   Learning Models in Games

Engagement in the game design tasks may help preservice the teachers develop technical and pedagogical skills for teaching as well as promoting the problem-solving and critical thinking skills. Through the game design process, the preservice teachers not just exercise these skills but also know the instructional method to support the potential students' problem-solving skills. Getting comfortable with games and game design needs first-hand design experiences, which teacher education program rarely provides (Van Eck 2016a).

Though using the game thinking has benefits and potentials in teaching, preparing the teachers to use it in their future practices may be challenging. Even though teachers can be taken as the enthusiastic users of the new concepts, they hardly see how to integrate them effectively in their future practices. Successful incorporation goes beyond the technical knowledge but also necessitates the nuanced understanding of the multilayered relation among technology, pedagogy, and content.

4.9   Level Design Learning

A game level is the part or segment of the game. To complete or finish the game level, a gamer typically needs to complete specific tasks or achieve particular goals to advance to the next level. The levels become more difficult as the player goes ahead.

Following are the steps involved in the level design process:
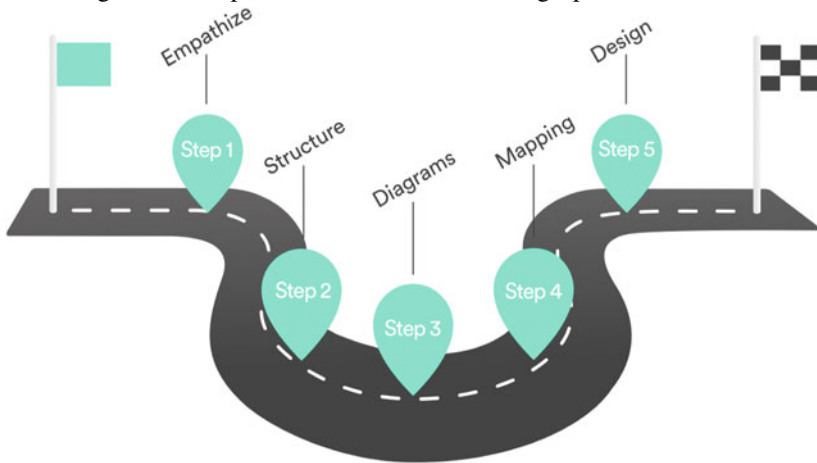
Step 1: **Understanding the constraints**: The designer goes through the common limitations while designing game levels.

Step 2: **Structure and brainstorming**: At this step, a designer decides what goes into the level.

Step 3: **Diagrams**: The designer adopts a visual method to outline what goes into each area of the level.

Step 4: **Rough maps**: A designer figure out from the diagrams that what goes into each area.

Step 5: **Finishing the design**: The designer moves from the basic design to develop the final spaces.

4.10   Quest Design

The quest in the games is the task that the player-controlled "party" or "character" or a "group of characters" can complete to gain a reward. Instead of telling people what they need to know, encourage them to find it or figure it out if they want to succeed in the game. Make succeeding in the game mirror what it takes to succeed in their jobs; for sales reps, success should mean they meet high sales goals, and so on. In the game, you make the measure of success hitting a targeted sales goal while making complaints and customer dissatisfaction negatively impact points or progress.

Here is a brief guideline for creating the best quest design:
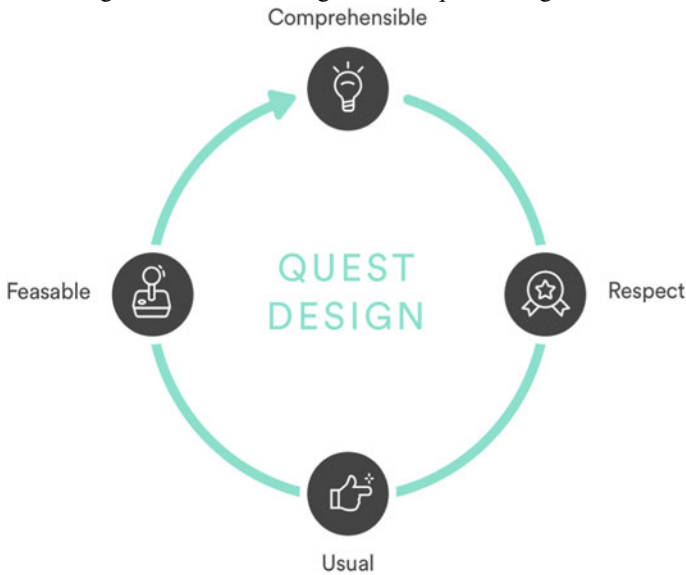
- A good quest informs clearly the main plot or the area it is in all respects—lore, even through rewards you get.
- A bad quest upstages the key quest in terms of enemies, stakes, or even the lore.
- The quest should be fun and fast to complete.
- The quest should utilize the core gameplay mechanics and avoid the special case new functionality. This entails having the same range of choices, reactivity, and results as a normal quest in the key plot, though the scope of these elements can be smaller.

4.11   Learning Game Design

Learning game design is unique from the instructional design. It needs experience and skills that are different from the instructional design. Learning game design creates a more engaging and exciting experience for the learners (Pringle 2014).

Game design integrates the same game activities that people find fun along with one more feature. These game designs aim to help players develop new knowledge or skills and reinforce their existing knowledge and skills. The goal of the learning game design is to not just engage the learners and make them understand the learning process but also to achieve a specifically designed learning outcome.

Usually, a game is relied on the reality abstraction as well as fantasy elements in the learning process and may not be the exact replica of the real-life situation.

4.12 Learning Curves in Games

The learning curve is a critically important element in determining how easy it is for the new players to understand your game and begin playing. However, when it comes to approaching, assessing, and developing the learning curve in games, you have to jumble together everything. The movement is put together; other assets such as weapons are added, maps are developed, features are added, etc. (Van Eck 2016b).

The primary learning curve usually looks like a general learning curve (downward slopping) but is often shorter apparently and in terms of time in relation to difficulty. This is due to the fact that this curve is reduced to what the player has to learn initially in the game, to be effective. It means that the initial learning curve is the representation of the amount of time related to the difficulty it takes the player to learn the bare minimum of what is needed for them to be able to start enjoying the game.

The initial learning curve for a general game typically consists of the following:
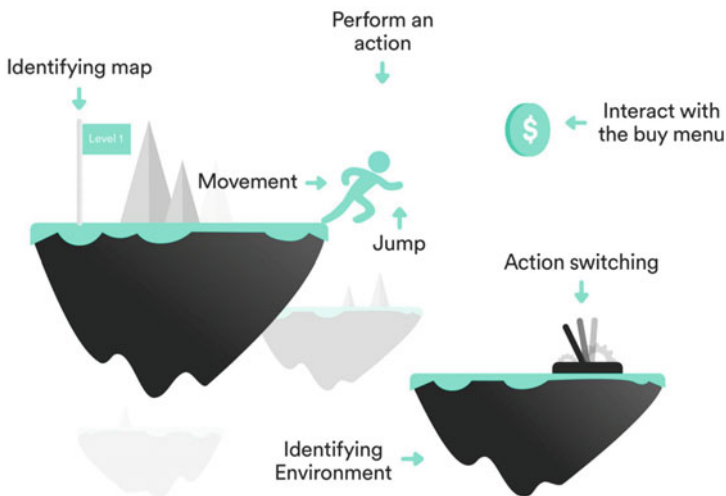
- Movement (forward, backward, side to side),
- Jump,
- Perform an action,
- Action switching,
- Interacting with the buy menu,
- Identifying maps, and
- Identifying environments.

The trick is to have a stepped challenge curve that tracks closely to the learning curve, so the player is always learning, but there are short plateaus where a player

can flex their knowledge of the game and feel powerful for a while before being challenged again. And from then on, we use level and quest design to teach players how to use the mechanics in different ways, combining them together to solve puzzles. The player doesn't actually get to use one of the coolest ideas in the game until the penultimate level.

4.13   The Criticism

Among the criticisms associated with games for learning in general is that games can lead to isolation and often anti-social behavior and may eventually result in short attention span. The claim on short attention may be considered true today due to the fast-paced and dynamic nature of the technological advancements.

However, the anti-social behavior aspect might not, since an increasing number of games are being developed for the social play. While few games may not enable face-to-face interactions, they surely mirror the real-world communication that is proved to be useful in personal as well as business transactions.

Others argue that using either a completely digital game-based curriculum or even one that is based heavily on the games needs additional equipment, software, as well as the training of teachers, and thus it may increase the admin costs. Some also believe that playing the games distract the learners from developing their valuable skills.

4.14   Conclusion

Gamification and game-based learning both promote engagement and sustained motivation in learning, but they do not necessarily result in improved learning outcomes. Game-based learning describes an approach to teaching, where students explore relevant aspect of games in a learning context designed by teachers. Teachers and students collaborate to add depth and perspective to the experience of playing the game. Good game-based learning applications can draw us into virtual environments that look and feel familiar and relevant. Within an effective game-based learning environment, we work toward a goal, choosing actions and experiencing the consequences of those actions along the way. We make mistakes in a risk-free setting, and through experimentation, we actively learn and practice the right way to do things. This keeps us highly engaged in practicing behaviors and thought processes that we can easily transfer from the simulated environment to real life. Most games feature elements such as rules, goals, interaction, feedback, problem-solving, competition, story, and fun. Though not all of the elements are needed to successfully gamify a learning activity, carefully selecting those elements that help meet the learning objectives of the course can be useful.

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Chapter 5
Learning Experiences in Real Life

Abstract In today's digital world, the usefulness, relevance, and real-world experiences must inform each dimension of a learning experience. When a student is involved or engaged in experiential learning, they learn to solve the kinds of complex, tricky problems that not always have the clear answers, just like life. This chapter discusses the ways to optimize the learning experience through the use of technologies, making lesson planning to be inspired from imagination, creativity, and the pursuit of knowledge. By connecting the classrooms to the real world using technology, instructors can validate the relevance of their subjects and give students a solid vision of what's possible. The chapter also presents the background information, learning structures taken from various sources, and the application of real-life learning experience, while throwing light on the differences between historic and contemporary learning.

Keywords Real-life learning · Authentic learning · Learning experiences · Relevant learning · Learning skills · Learning achievements · Learning objectives · Learning structures · Agile classrooms · Theory in practice · Historic learning · Contemporary learning

5.1 Introduction

Novel technologies in today's classrooms provide existing opportunities for the students to help them make meaningful connections with the world outside, from the protection and comfort of their school setting. The digital or information age has opened a world of massive opportunities for the instructors to establish the worth of their subjects in a broader life context by connecting the students' interests to the real-world experiences, helping the active students see the classroom as an environment that wants to be in.

The academic or learning model of the industrial era witnessed a one-size-fits-all approach where the students were obligated to listen only and not question, repeat, and memorize. With the passage of time, this has been changed and the way

instructors teach, and students learn. Cultivating the in-depth passion and under-standing of innovation, today's instructors look for achieving maximized learning experiences, so the students can develop the skills and expertise required to keep pace with a rapidly changing world (Robinson et al. 2016).

The purpose of today's learning experience is to prepare students for a real life. In this digital age, the information sharing economy being witnessed today, orig-inates from the connectivity, which is transforming the nature of learning since technology and learning go side by side, resulting in new opportunities for the students to network, collaborate, and exchange ideas.

Integrating the real-world connections into the lesson plan enables students to know that whatever they are learning is how much useful beyond their schools and universities premises. The learning experience in real life is the approach that works well for all kinds of curriculum almost since it is based on practical implementation of learning in real-life scenarios, thereby increasing students' engagement in the process since students gain insightful information for real-life applications of the skills they have been taught (Selwyn 2011). To optimize the real-world learning experience, the lesson planning must inspire imagination, creativity, and the pursuit of knowledge. By connecting our classrooms, whether in academic or professional setting, the instructors and trainers can better establish the worth of their lessons by letting students develop the vision for what is possible, while letting them have a meaningful framework for academic as well as personal development.

By adding multimedia activities provide an enriched context for the structured learning along with the alternative teaching methods. By bringing the teaching material to life via news feeds, streaming videos, and podcast, or even using extended reality applications, we can open our classrooms to up to a broader world where students can begin to witness the worth of learning. Increasing learning engagement via interactive education technology also encourage the students to become better students, while empowering the self-initiated learning since they develop an interest in what is happening around them and actively look for satis-fying their own knowledge curiosities (Clark and Mayer 2007).

Leveraging the new media for igniting the will to learn, also benefits the students across all stages of academic ability and achievement. By connecting them to the bigger picture, instructors can set the coming generation up for the success not only at school but in life since they explore the information that speaks to them and develop the innovative ways to relate themselves and the world.

5.2   How Is the Real-Life Learning Authentic Learning?

The real-life learning is often termed as authentic learning. It is a kind of learning that motivates the students to create a useful, tangible product to be shared with the outside world. When an instructor presents a motivational challenge, he or she nurtures and offers the basic criteria, timelines, planning, support and resources to enable the student success. The instructor becomes a guide, or a facilitator or an

event manager. Processes also become the potent force and the content gathered is organized properly into the portfolios (Kurbel 2001).

Learning experience in real-life approach engages all senses, letting students create a useful, shared and meaningful outcome. Many classrooms teach from either a visual or an auditory style, yet sight and hearing are only two of the senses. What about smell, touch, and taste? This is where multisensory learning comes in. Rather than vicariously talking about the topics and bringing the information up in a conventional industrial age modality, the real-life learning offers a student with the support for achieving a useful, tangible product that is worth sharing with their world and communities around.

Our one of the biggest flaws seen in education and learning in last few years has been neglecting the brain research that is readily available, affirming that using multisensory activities, doing meaningful tasks, and discovering a range of skills with the real-world applications is the optimal learning that must be practiced on a regular basis.

5.3 How the "Learning Experience in Real Life" Works?
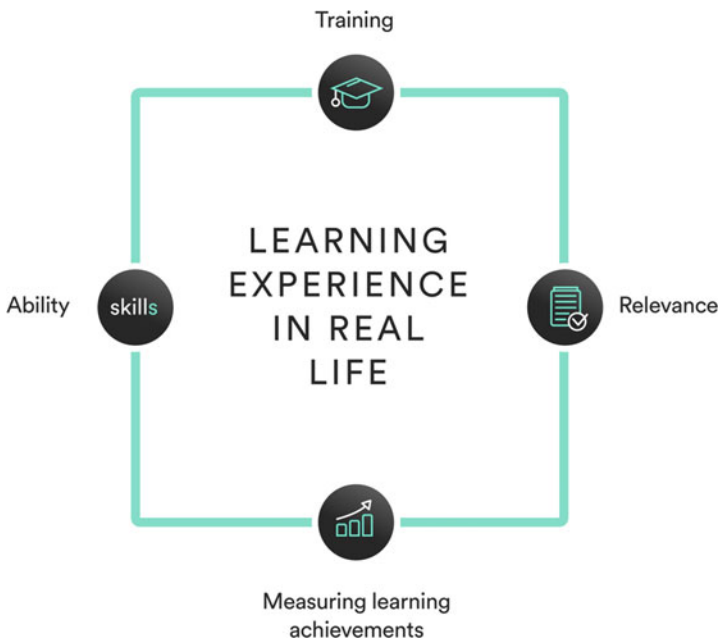
- **Relevance—making learning more alive!**

For instance, if you want students to learn about public policy, or economics or social issues, it is recommended to have them volunteer at some homeless shelter, interview city officials, legislators, research job-creation mechanism, make a multimedia slideshow or maybe documentary, and then present their practical proposal or research to alleviate the homelessness to the local leaders. If classrooms adopt more relevant and flexible approaches to teaching, a world filled with the best learning opportunities at once appears (Hwang 2014).

- **Learning skills applicable to all areas of life**

Students learn the skills that can be related to and applied in all areas of life. Students don't only read and analyze the ideas in English class, rather, the skills like reading, problem-solving, and critical thinking are quite essential in everything they do in their lives. Whether it's communicating successfully, working actively in teams, utilizing technology or just knowing how to be self-disciplined and organized, the real-world skills identify the success and employability in every domain of life (Hiltz 2009). The better the students can assess the information, solve problems and make an informed decision, the more self-sufficient, confident, and empowered they are as adults.

- **Multiple ways of measuring learning achievements**

Schools measure the student achievement through many ways. The real-world skills are not the facts that can instantly be memorized and recalled, and it is also not practical to assess the work readiness accurately using just multiple-choice questions. Apart from traditional tests, the instructors can take the benefit of a range of methodologies to evaluate the real-world skills, including the strategies like portfolios; the collections of the work samples of the student compiled with time, performance exhibitions, presentations and other vents where students demonstrate their learning, digital assessments such as the apps that enable students to meet learning benchmarks at their own speed and rubric; the tools that facilitate the instructors to consistently assess students' work in relation to some defined common standards (Johnson 2007).

- **Preparing the students graduate**

By leveraging on the learning-assessment strategies all through the learning tenure, the instructors can meet the specific learning objectives and requirements of students on an individual basis, and then change what and how they will teach those students. If the student is excellent in high-level readings, but finds writing difficult, the teachers understands, with a higher level of precision—what type of additional help is needed. If standards are measured consistently across all the subjects, grade levels, and courses, the teachers can have the data they may need to help all learners succeed. And when they prioritize the critical real-world skills, they become assure that their students will be graduated (Skinner 2004).

5.4   Learning Structures

With the emergence of the World Wide Web, the content is instantly and readily available to all. We can easily reference, research, and cross-reference any topic at a fast speed and do it at any time whenever required. We can access the information through mobiles, computers, or tablets. The question is that is still relevant for the instructor to predominately distribute content to the students, and then assess the regurgitation of it given as the key assessment of a student's learning ability?

Real-world learning allows students to prove their skills via a series of the unfolding learning processes having a definitive product that they can essentially demonstrate. At no time in history has information (content) been so readily available to the masses, but it's the synergy and processes of engagement that defines our human experience. That's where the real value in education lies today (Termos 2012).

In today's technology-driven and interconnected world, a learning environment has become online, virtual, remote; or in other words, it is no more a place at all. Maybe a better way to think of today's learning structures is as the support systems, organizing the state in which humans learn to their best—systems that integrate the unique learning needs of all students as well as support the constructive human relationships required for an effective learning.

Learning environments are basically the learning structures, methods, and communities that inspire both the students and educators to get the skills and knowledge that are demanded in real life. According to the experts, today's learning structure must be made in contexts that endorse communication and a sense of community, which leads to both formal and informal learning (Al-Asfour 2012). Therefore, it is important to discuss the relationship of technological systems and physical spaces to learning, but more importantly, you must consider how these exclusive resources support the constructive human relationships concerned with the learning. And while the technology, culture, space, time, and policy must be considered while developing or adopting any learning structure, it is equally important to keep in mind that their power is cumulative.

Our learning structures and the learning environment work as a synergistic and an aligned system of systems that:

- Creates real-life learning practices, physical environments, and human support that will support the learning and teaching required in a practical life.
- Supports the professional learning communities, enabling the educators to collaborate and share best practices, and then integrate real-life skills into classroom practice.
- Enables students to get learning in the relevant, real-world contexts (e.g., through project-based work or other applied works).
- Provides equitable access to the high-quality learning tools, resources, and technologies.
- Provides architectural as well as interior designs for individual, team, and group learning.
- Supports the expanded community and an international engagement in learning, both online and face to face.

5.5   The Significance of Smart and Agile Classrooms

Classroom design is a genuine issue in most of the school districts nowadays.

Going hand in hand with the push for personalized learning, the driving concept behind agile school design is flexibility. Students' days are full of choices that empower them to decide how they learn best, and they need an environment which supports that. An agile space also gives teachers the ability to respond to different students' needs. To allow for maximum utility of the space, portable furniture is a must in an agile classroom design.

The agile schools use technology as a tool to stimulate curiosity and inspire students' desire to learn. Technology, whether it is laptops, tablets, or mobile devices, puts information at students' fingertips and motivates them to research and make discoveries.

Maybe the most important guideline for a learning experience in real-life approach is the "design for flexibility." As no one can forecast how educational technologies and the teaching modalities will be evolving in future, learning spaces should be adaptable to whatever changes we may come across in future (Liyoshi and Kumar 2008). To achieve this flexibility, architects are designing classrooms, or "learning studios," with moveable furniture and walls that can easily be reconfigured for different class sizes and subjects. The school building itself should inspire intellectual curiosity and promote social interactions.

Technology and interactive environments that present students with challenges that require them to understand and apply important concepts. The interactivity of these technology environments is a very important feature for learning. Interactivity makes it easy for students to revisit specific parts of the knowledge to explore them more fully, to test ideas, and to receive feedback. Noninteractive environments are much less effective for creating contexts that students can explore and reexamine, both individually and collaboratively.

5.6   Theory in Practice

Connecting the education and learning to the real life and beyond the school experience, the theoretical models and scientific research available in this context, signify some ideas to take the lessons beyond the classroom and closer to the real world (Shiao 2013).

1—Be practical

Incorporating the practical scenarios into today's classroom makes a more engaging lesson, letting students become familiar with the global issues and helping them make connections between what is happening in the real world and what is being taught at school. Benefiting from a broad range of cultural, political, and social perspectives, they might not otherwise be exposed to. By doing this, students are encouraged to keep up with their surroundings, the world, and the latest news to develop a more responsible viewpoint and be prepared to operate in a globalized, multicultural economy.

2—Use technology

A recent study found that students spend an average of 30 min on their mobiles during class. Rather than ban devices, why not incorporate technology into the classroom? In the workplace, phones and other technologies are readily used—so it makes sense that learning how to manage them and get the most out of what they can do should start in schools to prepare them for their future in a technology-driven world. Consider getting students to conduct research using their phones or incorporate online learning resources as part of the lesson.

3—Encourage group work

Working in diversified teams replicates the office for most professions so it's helpful for students to get used to teamwork in the classroom. Problem-based exercises provide the shared learning experiences, and they are an opportunity for the students to learn through discussion, evaluation, and clarification of ideas—with studies showing that students who connect with each other and wider communities through social learning attain higher level thinking and preserve information for longer than those working on their own.

4—Teach authentic learning

Rather than teaching students to bring up information, teach them ways to find it. In the digital age of modern search engines, the students don't need to recall facts the way they did under the industrial era education model—what they should know now is how to examine and estimate the information that they are provided with. Media literacy is a skill, showing students how to distinguish between credible resources and fake news so they can take more informed decisions to develop their understanding and make a contribution to the world.

What is required in the future workforce are students who can better understand the world and the way it works. Connecting classrooms to the learning experiences in real world and real life needs the education system to sensibly integrate technology into the curriculum to prepare students with the tools needed to meet the demands of a knowledge-driven society. One challenge in this way can be the ready access to shared media resources, though there are solutions like digital newspapers that can be easily referenced within the classroom activities.

5.7   The Historic Versus Contemporary Learning Experiences

- **Historic learning experiences**

The back-to-basics education method, also called the conventional education, is still widely being used in schools. The old-fashioned methods of learning were all about recitation, for instance, students would sit in an utter silence, while one student after another used to take a turn to recite the lesson, until all students had been called upon. The teacher would examine each student's recitation. This also entails that students are expected to study and memories the assignments. At the end of the module, a written test or oral examination would be conducted; this process was called an assignment study recitation test (Shurville et al. 2009).

The way in which these methods were taught assured that the students were rewarded in exchange for their efforts, used class periods competently, and exercised clear rules to manage students' behavior. They were based on established customs that had been used successfully in schools over many past years. The instructors communicated the knowledge and enforced standards of behavior. This conventional learning experience was thus confined to the classroom boundary and students could often find themselves not knowing how and why their learning should be applied to the practical life.

- **Contemporary learning experiences**

Education reforms mean that learning is taught from a totally different angle. Contemporary learning practices focus more on the individual student's needs and the application of their learning in real life, instead of assuming all students are at the same level of understanding and should just memorize and get good grades. The contemporary way of learning is more activity or practical based, using questioning, demonstration, explaining, and collaboration techniques (Nagy 2015).

One contemporary method is experiential learning—or learning by doing—is an important element in taking learning beyond the classroom and engaging in real-world experiences. Today's youth wants to be more agile and entrepreneurial to be successful in a twenty-first century workplace—and technology is part and parcel of this brave new world. The combination of technology and experiential education is, at its core, an attempt to future-proof today's learners to thrive in an uncertain future. Today, the thoughtful integration of technology can be used to enhance experiential learning, helping to link theory with practice and develop valuable, lifelong skills, and strategies. New technology allows us to document components of the learning experience for reflection and analysis using various forms of media. Also, the game-based learning or gamified applications support a more immersive form of learning that can be highly motivating and engaging for young people, to discover meaning and mastery. For example, the use of game models that replicate real-world condition.

5.8   Conclusion

By connecting the classrooms to the real world, instructors can validate the relevance of their subjects and give students a solid vision of what's possible. The purpose of today's learning experience is to prepare students for a real life. In this digital age, the information sharing economy being witnessed today, originates from the connectivity, which is transforming the nature of learning since technology and learning go side by side, resulting in new opportunities for the students to network, collaborate, and exchange ideas. Leveraging the new media for igniting the will to learn, also benefits the learners across all stages of academic ability and achievement. Learning experience in real-life approach engages all senses, letting students create a useful, shared, and meaningful outcome. As no one can forecast how educational technologies and the teaching modalities will be evolving in future, learning spaces should be adaptable to whatever changes we may come across in future.

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Chapter 6
Gamified Learning Experiences

Abstract Gamified learning is widely used in an educational context as a tool to increase student engagement and motivation. The chapter discusses this educational approach, integrating game elements in a learning environment. The purpose of gamified learning experiences is to maximize learning with enjoyment and engagement, capturing the interest of the learners to help them learn more. Hence, gamification, the process of defining the game elements that motivate and intrigue the interest of the students and applying these elements into a nongame context (learning) to influence behavior, is also a part of the discussion in this chapter.

Keywords Gamified learning · Structural gamification · Content gamification · Theory in practice · Characteristics · Content · Goals · Game elements · Game mechanisms · Multiple performances · Feasibility · Difficulty level · Multiple paths · Non-technological learning · Technological learning · Badges · Leaderboards

6.1 Introduction

Student engagement means the degree of the learner's active involvement, degree of interest, passion, and attention that learners show when they participate in a learning process (Reeve 2012). Student engagement is a critically important element related to improved learning outcomes as much research has suggested that significance of student engagement for achieving a positive learning outcome (Trowler 2010). The more the students are engaged in learning, they more they would learn as well as progress in their learning.

In the scientific literature, research on gamification or gamified learning experiences has shown that this is effective for engaging and motivating the learners to drive their behaviors and influence the required outcomes (Brigham 2015). There is a rising interest in applying the idea of gamified learning in education and many educators have also applied it to the learning activities in many settings. In addition, many studies have indicated that the potential of gamified learning in teaching as

well as learning. However, still, there is a need for more studies to show the implications of gamified learning experiences in different learning environments (Borges et al. 2014).

The millennials are called the digital natives or digital learners, having new profiles. They are growing up amid digital technologies and possess diverse learning styles, attitude toward a learning process and high expectations for teaching and learning. Instructors are also faced with the challenges in this regard and are required to solve critical issues regarding the adaptation of learning process toward the students' needs, requirements and preferences. They have to apply different teaching approaches and methods that enable students to be an active participant with strong engagement and motivation toward their learning. Modern pedagogical trends and paradigms in education, backed by information and communication technology, have created prerequisites for applying new techniques and approaches to achieve active learning (Klem and Connell 2014). Gamification in the training and development is one of these modern trends.

6.2 Gamified Learning Experience

One way that gamification and game-based learning can be applied to courses is to add a degree of experiential learning. Experiential learning is as mentioned in the previous chapter that a student is learning by doing. In this way, a student learns by experiencing a problem directly and finding out the right and wrong answers based on actions that they take. This is the most memorable way for a student to gain knowledge. However, learning from direct experiences can be time consuming and difficult to measure. Therefore, adding a gamified element to a simulation can allow for both—learning is measurable as well as experiential.

Simulation, for instance, provides a safe environment where a student can safely experience something dangerous. It also allows the student to try a task or skill multiple times, seeing what happens when a different choice was made. Assessment items can be tied to choices that are selected, or can be external to the game, such as discussion questions or a written assignment based on the experience. In this way, students take the time to reflect upon their actions.

The idea of adding relevance to a course can also benefit from game design. A course should not only present information to the student, but also show them how it will apply to their lives. A student should understand that the course is important to them. Using game elements, students can easily view relevance if the material is presented in a believable way. Gamified applications can place them in an imaginative situation or make them reason through a problem. Placing the students in a virtual environment that is close to what they will experience in their own lives will enhance the relevance of the course for them.

One strategy that could potentially enhance the relevance of a course is to add avatars. Avatars can provide a sense of hyperrealism for students, allowing them to interact with people the way they would in their everyday lives but with less risk. Avatars can have a variety of roles, from the character who experiences a situation and help the student to reflect upon a staged situation. This gives them the help they need without handing them the answers. It also encourages them to reach out for answers to important questions.

6.3   Structural Gamification

This is based on the integration of game elements in the context to stimulate a student through content without any change or alteration to the content. The content is not game-like, just its structure does, around the entire content. This structure primarily focuses on the kind of gamification for motivating the student to absorb the content and engaging them in the learning process through rewards.

For example, a student winning points in the pursue for completing a task or watching a video where the task or video didn't have game elements related to them other than the fact that the learner gained points for completing a task or watching a video.

The most commonly found game elements in structural gamified learning experiences are badges, points, levels, and achievements. This also includes a social element where the students can also share their accomplishments with others and share what they gained. Though, you can add elements of characters, story, and other game-based elements in the structural gamified learning, the content doesn't become game-like (O'Donovan et al. 2013).

6.4   Content Gamification

This is based on the application of game thinking and elements to change the content to make it game-like. For instance, integrating the story element to a compliance-related course or a beginner course having a challenge rather than a list of goals, are both techniques used in content-based gamified learning experiences (Reiners and Wood 2014).

The current education is often faced with lack of motivation and engagement of the students to be an active participant in the learning process, due to which, instructors are shifting to gamified learning to provoke students and motivate to take part in learning actively. The gamified learning process is based on rewarding

the achieved results and efforts through awards, which eventually leads to higher motivation level of the students in the activity.

Applying the gamification principles in education and learning makes sense as there are some facts typical for the gamified learning structure. The actions of users in the games are aimed to accomplishing a specified goal while passing through the obstacles. There is a learning objective in every learning context, which is to be achieved by completing the learning activities and interactions within the learning content. Tracking the student's progress in a learning process is another important element since the next moves and steps are based on their previous results. In learning contexts, whether academic or business, the progress of learning is important to achieve learning objectives. The students' learning path is figured out by the achieved levels of skills and knowledge (Glover 2013). This is the basis of gamified learning experience. The collaboration of gamified learning in education and training is a milestone for the efficient execution of active learning. As opposed to traditional education and learning methods, gamified learning is based on a strong competitive element and long-lasting learning. The focus in gamified learning structure is toward the development of skills for teamwork, collaboration, and responsibility for the performance of a group rather than the competition among the students only. Gamified learning experiences, thus, are not directly linked with the skills and knowledge, since they also strongly affect students' commitment, motivation, and behaviors, leading to enhanced level of skills and knowledge (Hsin-Yuan Huang and Soman 2013). Incorporating such elements makes your learning content more game-like but doesn't convert it into a game. It only provides the activities or content used within a game that you can add to the content being taught.

Most of the games feature the elements like rules, goals, interaction, feedback, problem-solving, competition, story, and fun. Though not all of the elements are required to successfully gamify a learning activity, but the careful selection of those elements helps you meet the learning objectives of the course.

6.5 Theory in Practice—Applying Gamified Thinking to a Learning Experience

The development of a successful strategy for implementing gamification in learning and achieve an effective gamified learning experience is based on an in-depth analysis of the current conditions of the learning context and available pedagogical tools. The process of applying gamified thinking to the actual learning experience is based on the following steps:
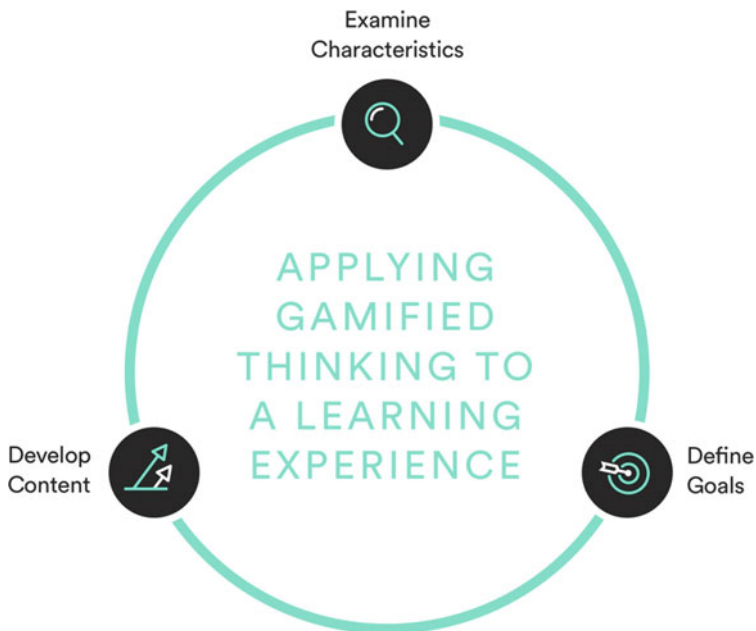
1. Determine the students' traits and characteristics

Once you implement the innovative approaches in your learning process, it becomes of utmost importance to determine your students' characteristics. These characteristics or traits are their profiles that must be determined to know whether the new techniques and tools like gamified learning would be favorable. The decisive and major factors are the predisposition of the students to interact with the gamified learning content and to participate in the learning events having a competitive nature. It is important for the instructors to determine and think what skills and knowledge are required by the students to achieve their learning. If the tasks are either very easy or tough, this may lead to the demotivation of the students and thus, negative learning outcome. The motivation of the students to take part in the learning process is heavily based on the context of their learning process, how well all the elements are balanced and what follows from their accomplishments.

2. Define the learning goals

The learning goals must be clearly defined and specific. The purpose of learning is to achieve the learning goals, and otherwise, all gamified activities will be pointless. The goals also determine what learning content and tasks and activities should be included in the process and selection of the suitable game techniques and mechanics to accomplish them.

Defined goals are arguably the most fundamental aspect of games and gaming. Clear goals and objectives ensure that players have a purpose and focus while playing the game. Goals should be clear and visible; this provides players with feedback on progress and increases motivation. Without a clear goal, it's impossible for learners (and players) to understand if their efforts are getting them closer to the overall objective and to ultimately decide who wins the game. Having a clear goal also gives learners the autonomy they need in order to achieve the goal in new and creative ways.

For example, students might be incentivized to deliberate readings before or immediately after class by making them optional but assigning the experience points (XP) for an individual post or reply to another post. Points earned may go for additional help on an assignment (like allowing a draft to be checked or reviewed first, or having an automatic extension granted), or to totally bypassing an assignment (if the student reaches a specific number of points, they no longer need to complete a specific assignment in the course).

3. Develop educational content and activities

The learning content you develop for gamified learning experiences should be highly interactive, rich, and engaging in a multimedia setting. The training tasks and activities must be developed customized to the learning goals and enable clearly established rules are another essential element of games and gamification (Simões et al. 2013). Rules provide the guidelines that players use to achieve the goals. Offering a framework that all learners (and players) can work within ensures that they compete on a level playing field as they work toward the objectives of the gamified learning application. It is a good idea to test out the rules in a pilot session before rolling out your educational content. This is because humans are endlessly creative and will discover unintentional loopholes and shortcuts within your rules that you may have overlooked when putting the gamified learning environment together.

The activities are as follows

- **Add game elements and mechanisms**
  The key aspect of the gamified learning experience is the integration of tasks that students should perform. The tasks performance leads students to points accumulation, higher levels, and awards. These actions are objected to fain predetermined learning goals. The elements to be included in the training are based on the predefined goals (what skills and knowledge should be gained after the end of the task). Activities that need independent work by the learners bring their individual rewards like badges. Activities that are based on interaction with other students are called the social element of learning as they make students a part of a big, scalable learning community, where their outcomes and achievements are public and visible, for instance, leaderboards (Landers and Landers 2015).

- **Multiple performances**

  The learning tasks and activities should be developed so that students are able to repeat them in case if they have an unsuccessful attempt. It is critically important to develop the conditions as well as opportunities to develop an ultimate goal. As a consequence of repetitions, students would have a chance to improve their skills.

  Adding a social element to gamification can be highly motivating as individual students feel that they're contributing to group progress. Sharing the experience and having an opportunity to discuss the learning cannot only make the learning process more enjoyable, but the discussions can also help to reinforce the learning itself. To incorporate cooperation within your gamified application, try splitting a larger group into smaller teams or add in useful resources for students to exchange and barter with in order to gain an advantage.

- **Feasibility**

  The learning tasks and activities must be achievable. They should be adapted and tailored to the potential of the students and their skill levels.

  Displaying player points on a leaderboard provides a chance for students to interact with each other and discuss the goals, adding a visible element of competition and an incentive for students to play the game again and again.

  When designing leaderboards, it's advisable to keep the number of players involved in small groups. If players perceive that there is no realistic chance of them making the leaderboard, the process can be extremely demotivating. Keeping the groups relatively small means that no player is ever too far from the top.

- **Elevated difficulty level**

  Every subsequent task or activity should be smarter than the previous one, requiring more thinking, skills and efforts from the students and corresponding to their freshly gained skills and knowledge.

  When developing a game, it can be tricky to benchmark the difficulty level in order to keep players at the proximal level of development. This is where levels come in. By providing multiple difficulty levels, it's possible to integrate players of different abilities, giving your gamified application a broader appeal.

  Multiple difficulty levels can be achieved by creating easy, medium, and hard questions, or by offering different levels of support for each question. Letting students choose which level they play at can increase engagement as it gives users a level of control over their gaming experience, offering more points for playing at more difficult levels can then incentivize students to push their learning within the gamified environment.

- **Multiple paths**

  To let your students, develop the diverse skills, they must be able to accomplish the goals by adopting different paths. This enables students to develop their own strategies; a key feature of the active learning.

  Games use almost constant feedback as players move through the gamified environment. This feedback typically takes one of the three forms:
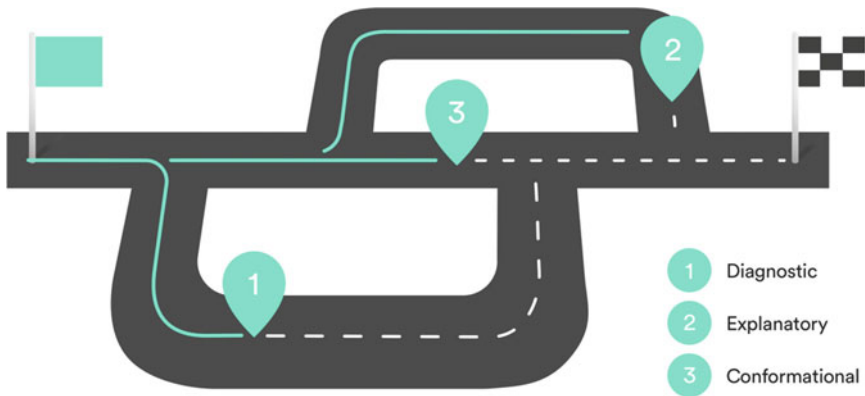
- **Conformational feedback**: This indicates the degree of 'rightness' but does not tell the student how to correct the action.
- **Explanatory feedback**: Which provides an indication as to what was done wrong.
- **Diagnostic feedback**: Which tells the student what they did wrong and why and steers them in the direction of correcting the action.

6.6   Badges and Leaderboards—Implemented with Care

Badges are often used to acknowledge student`s work accomplishments. For example, students may receive a badge if they achieve certain levels of success on assignments, or if they do additional work, such as submitting a draft or sharing notes with another student. They may even be the result of simple participation: accessing the course through the LMS five times a week over the course of a semester could earn a badge. Student badges may be displayed to other students in the class as a means to encourage competition or to demonstrate the variety of badges which can be earned.

As mentioned, competition can motivate students and can be leveraged by leaderboards that showcase the distribution of point totals that students have accumulated through various learning activities. As mentioned, caution must be taken when constructing leaderboards because displaying all students in order of point totals can be a disincentive for students at the bottom (Farzan et al. 2008; Landers and Landers 2015). Consider using a system in which students see only the two students who are directly above them and below them, in order to foster a healthy sense of competition without discouraging students who are performing poorly.

6.7   Implications Using Gamification in Learning

Although the main objective of the gamification in learning is to improve and inspire learner engagement toward the learning process (Borges et al. 2014), the understanding of the engagement influence has been investigated differently by researchers on the basis of their study and understanding.

In fact, the utilization of gamification in various levels may explore the gamification effectiveness in a wider scope. Data logs, qualitative investigation (observation or interview), and indeed the quantitative investigations have been extensively used in previous studies. Several studies have also studied the efficiency of gamified platform within gamified and non-gamified environment of learning. Behavioral change, performance, and satisfaction, are the most outcomes studied for the gamification influence on the users. However, we argue that there are more any other assessment measurements that can be examined in relation to the core outcome of gamification, which is user engagement (Codish and Ravid 2014). Besides that, gamification setting has also been applied in combination with other kinds of computer-based learning platforms like learning courseware, homework, e-learning system, and tutorial system as well as in a virtual world system. This shows the opportunities of gamification to be applied in a diversity of computer-based learning applications including extended reality and others.

6.8   Non-technological Versus Technological Contemporary Gamified Learning Experiences

- **Non-technological gamified learning experience**

In non-technological gamified learning environments, the students are given the premade games that reinforce their skills. In these contexts, games are usually used as either rewards or add-on. The learning process is based on letting students know the rules before they start playing the games. Incentives or prizes are only for the game winners. The key takeaway in non-technological gamified learning experience is target skills such as parts of skills, multiplication, etc. The tasks are usually independent and don't require teamwork or collaboration. The feedback mechanism is slow and competitive environment is hard to find in non-technological settings. Lastly, in such learning processes, students are more focused on completing their targets for the rewards, not especially for acquiring a specific skill or knowledge.

- **Technological gamified learning experiences**

In technological gamified learning experiences, students may also be allowed to choose, modify, and create the gamified application that helps them learn and develop new skills. The applications in these contexts are the parts of the process,

from pre- to post-assessment stages. Students are encouraged to determine the logic behind the game elements and achieve the required skills and knowledge. The incentives in this process are not a straightforward process. It is rather based on an increasing level of difficulty and application of the previously gained knowledge and skill in the last level, which makes it more long-lasting for the students. Technological gamified learning experiences are usually based on the collaborative or team-based work environment, which helps students to share their experiences and achievements with others and learn from others, in return. Application of game elements helps students know their existing skills level and get a chance to have quick feedback. The learning environment is active, where students tend to perform better and thus, lead to higher competitiveness. In addition, the inclusion of the latest technology and equipment like tablets, laptops, webinars, mobiles, online forums, and Learning Management Systems (LMSs), enhances today's learners' performance and engagement with every level they pass.

6.9   Conclusion

It's important that learners can see the progress they're making if the content is gamified; this can be done in the form of progress bars or running points tallies. If achieved, it's important to let each learner get a feel of mastering the topic to keep motivation levels high in a gamified setting, and if the game becomes more important than learning conflict refers to a scenario in which players can actively stop each other from succeeding. In context, competition refers to when players can focus solely on maximizing their own performance and cannot influence the performance of their opponent. Within the gamified learning environment, it's better to use competition rather than conflict so that students focus on their own performance and are not incentivized to obstruct the learning of others in order to win the game. Game elements and mechanisms can be implemented in the learning process as activities which purpose is to achieve certain learning objectives, increase students' motivation to complete them and engage students in a friendly competitive environment with other learners. Gamification is an effective approach to make a positive change in students' behavior and attitude toward learning, to improve their motivation and engagement. The results of the change have bilateral nature—they can affect students' results and understanding of the educational content and create conditions for an effective learning process.

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Chapter 7
Game Design Principles Usable in Gamification

Abstract This chapter presents focuses on a few principles of game design used in gamification. Game design is the process of applying the design and its aesthetics to develop a game for either educational, entertainment, experimental, or exercise purposes. Game design bears significance to develop rules, challenges, and goals applicable to various kinds of gamification settings. We will discuss game design as a concept, game as a tree, dynamics, game theory, game thinking, and game design elements, success criteria development, and types of games interaction. In addition, it highlights the game design and its application in non-game-based settings involving engagement and decision-making. It also included the game flow model, goal-setting theory in gamified settings, constraints and rewards, and incentives. The last part of the chapter bears important implications for the designers by highlighting what is not gamification and the considerations to make for differentiating between the two for determining design principles truly usable in gamification.

Keywords Games · Game thinking · Game flow · Models · Evaluation games · Objectives · Goals · Constraints · Success criteria · Rewards · Game design · Relationships · Interactions · Narration · Design solutions · Game theory · Game-inspired design · Rule development · Victory conditions · Players · Player-centered design

7.1 Introduction

In academic terms, game design is the part of the comprehensive game studies, while game theory involves the study of strategic decision-making, mainly in the non-game settings. Games have inspired historically the seminal research in the areas of artificial intelligence, probability, optimization theory, and economics.

Game design principles are seen everywhere; from education to technology to finance to corporate culture and therefore we see gamification on the rise. Setting up the games with clear constraints as well as goals helps you focus on your efforts and

energies, can clarify and enhance the outcomes, and motivate to move ahead to the following clearly designed challenge as well as a reward cycle.

Game design increasingly cross the traditional boundaries on the medium, as shown by the growth of pervasive and serious games as a research and industry field. The widely talked phenomenon seen in this trajectory is the gamification; the umbrella term we use for the usage of game elements (not the full-fledged games) to enhance user experience as well as engagement in non-game applications and services (Kort and Ljsselsteijn 2008). An increasing number of researchers in the Human–Computer Interaction (HCI) and management sciences have determined the design elements that increase the motivational affordances of the computer-supported collaborative work principles that are congruent with the research on the motivational psychology of the video game (Lockton et al. 2010).

7.2 Games

Games are very versatile in nature; hence, it may be hard to define what the games are (Juul 2005). Game is a rule-based system having a quantifiable and variable outcome, where diverse outcomes are linked with different values, the players attempt to influence the outcome, they feel emotionally attached to the outcome, and the result of the activity is negotiable. The games rules come with a story, which brings meaning to the actions (Bernhaupt 2010; Koster 2004). It is also essential to ensure that the player follows the rules of the game voluntarily (Suits 2005), or else, the player won't be playing a game, or would be cheating. Games have a range of contexts and forms, and almost everything can be transformed into a game.

Games are usually used for the entertainment purpose, but there are also purposeful or serious games that are played for a range of purposes, like experiential learning. Pervasive games give games a new context, space, and situation, implying that they break the magic circle of play temporally, socially, or spatially (Montola et al. 2009).

Purposeful games, which also refer to an online tool to create and play interactive games, are one of the best examples of the educational side of games. Purposely games make it possible to create game strategies and apply them to other areas (such as the development of soft skills). The aim is to ensure active learning and to improve the evaluation of the person taking part, without them giving up or losing motivation.

7.3 Game Thinking

In simple words, game thinking is defined as the use of games and game-like approaches to resolve problems and develop better experiences. Game thinking is vast notion that covers the areas of playful design, serious games, gamification,

simulation, and play games and toys. All these are the non-game contexts where the game elements are used to achieve specific outcomes (Juul 2017).

Game thinking is the science and art of engaging users on a path to mastery. One critically significant aspect of game thinking is developing an experience. This is usually done through audio, visuals, and storytelling, like developing a virtual world. The experience makes the game useful and learning oriented for the player. Developing the right type of experience can be viewed as the creative side of the game design.

7.4   Game Design Framework

Games can be divided into the game design elements that make the games. These game design elements are further divided into lower and higher level elements. Werbach (2012) has presented the hierarchical pyramid representation of the game elements, according to which game design elements are divided into dynamics, mechanics, and components, where dynamics present the highest level elements while the components present the lowest level. These game design elements lead to an overall user experience of the game. The user experience is made in parts with aesthetics such as sound and visual. Game dynamics reflect the big picture that shows the structure of a game, of which the rules might be manifestation. Dynamics are also taken as the grammar of the game elements. Examples of the game dynamics are emotions, constraints, progression, narrative, and relationships which make the basis of developing meaningful choices.

Game mechanics are the elements that trigger an action in a game. Mechanics are taken as verbs. Examples include challenges, competition, feedback, cooperation, rewards, resource acquisition, transactions, win states, and turns. Challenges bring goal for the player to achieve and chances imply the involvement of luck.

Game components are the specific instantiations of the game dynamics and mechanics. Components are taken as nouns. Examples of the game components include avatars, achievements, badges, collections, boss fights, unlocking, leaderboards, quests, points, virtual goods, etc. For instance, badges show the achievement while virtual goods present objects in the virtual world.

7.5   Game Design Elements

Some of the most common and important elements in a game include (Sweetser and Wyeth 2005) the following:
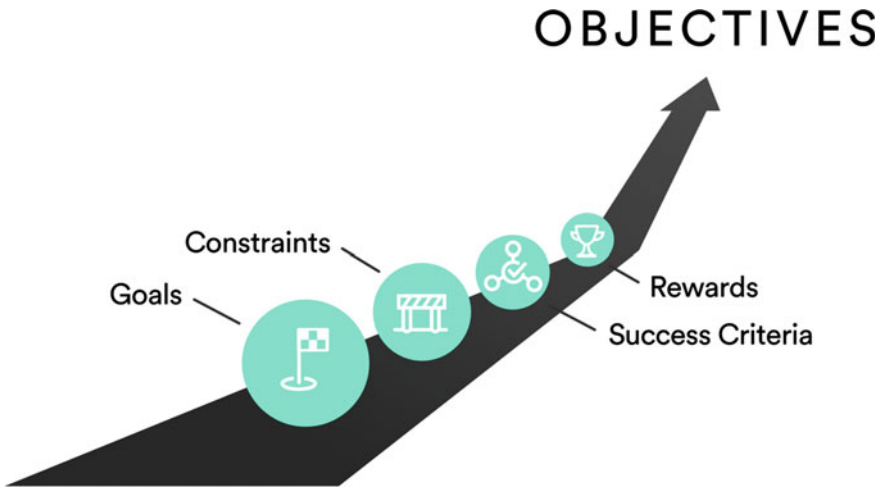
Setting up games with popular and clear objectives to help achieve the desired outcomes:

- **Goals**
  There is a kind of goal or some outcome in a game that players can work toward. The more defined and concrete is, the easier it becomes for the players to participate. However, fuzzy objectives may be more rewarding as they model the real situations in a better way. Also, it is important to mention that the game objective isn't the same as a learning objective.

  Goal-setting theory has been used for decades to explain how to motivate people to perform better in work-related tasks by setting and monitoring goals. Gamification is also inherently a goal-oriented activity, aimed at fostering motivation; therefore, it is logic to expect that these two practices would fit very well together and help us design better motivational experiences.

  Goal-setting theory is a theory of motivation that aims to explain the causes of people's performance in work-related tasks. It was developed from findings of hundreds of empirical studies and posits that performance is directly related to the goals set by individuals for pursuing. Both the content (the object of an action) and the intensity (the difficulty or the amount of effort required to achieve the goal) are relevant.

  There is a linear relationship between the degree of goal difficulty and performance. Difficult goals lead to higher performance than no goals at all or abstract goals such as "do your best." Therefore, goal-setting theory posits that optimal performance is achieved when goals are specific (the objective to accomplish is clear) and difficult (the achievement of the goal requires considerable effort) (Locke and Latham 2002).

  Although having goals is not a requisite for gamification, goals are present in many gamified applications. Hence, goals are often specific in gamification,

consonant to the theory. In practice, there are many ways by which goals can be implemented in gamification designs; however, there are two common strategies: giving the users clear goals to follow or allowing the users to self-set their own goals. These goals can be explicit, identified as goals or quests, for example, or they can also be implicitly presented as outcomes that can be pursued, such as earning badges or achievements or reaching a certain position in a leaderboard. The reviewed literature recognizes the following elements as potential mechanisms for goal setting in gamification: badges, leaderboards, levels, progress bars, rules, goals, challenges, conflict, points, achievements, and rewards.

- **Constraints**
  A constraint is a rule that applies throughout a game mode. A constraint enables or restricts play in certain ways, but it does so universally and usually without variation. Constraints let the player know the boundaries of the game world, and the player develops an instinctive feel for them. They frame the actions that the player can take, and so the game world becomes a functioning self-enclosed system.

  Players can sometimes affect constraints, depending on the game. When the player buys upgrades in a game, for example, he or she permanently alters the features in the game system. The player has changed the constraints, and so interactions will play out differently than previous attempts.

  Constraints also play a role in AI behaviors. Non-player characters often have default or randomized behavior patterns that they follow when not directly interacting with the player. The ability to recognize those patterns allows the player to play with a sense of strategy. Once he or she understands a constraint, it often becomes an advantage rather than a hindrance (Lockton et al. 2010).

- **Success criteria**
  There is some way of determining when the objectives are achieved. The clearly defined success criteria develop expectations and engage more gamers. There are games that are less structures and have less well-defined criteria. This ambiguity makes such games sometimes to better model some scenarios, but more difficult to sell in an organization as they don't have a defined ending.

  However, it has also been predicted that a majority of gamification implementations are doomed to fail due to poor understanding of how to successfully design gamification. This gap canonically often manifests as modest gamification designs commonly consisting only of simple mechanics, such as point, badges, and leaderboards. Gamification is difficult to design:

  (1) The source of innovation, games, are complex, multifaceted, and therefore difficult to holistically transfer to other environments.
  (2) Gamification involves motivational information system design which entails understanding a host of (motivational) psychology.
  (3) The goal of gamification is commonly also to affect behavior which adds yet another layer into the scope of gamification design (Arrasvuori et al. 2011).

  Gamification is typically applied in order to enrich information systems or services with motivational affordances for gameful experiences. Therefore, it is

reasonable that both a profound understanding of the target group and the characteristics of the system that should be gamified are of particular importance to design gamification approaches (Brito et al. 2015).

- **Rewards**

  Incentives that reward success can be intrinsic outcomes of the game (good results and recognition), embedded in the game itself (getting more Monopoly money), or external recognition or prizes (the winner gets dinner at a nice restaurant). Balancing rewards between players can be a challenge and needs to be considered when adopting games.

  According to the theory of human motivation, our actions are driven by outside reinforcement. Gamification combines as we know two motivational affordances: extrinsic/external rewards such as levels, points, and prizes to improve engagement; and intrinsic/internal motivation from striving to raise the feelings of mastery, autonomy, and a sense of belonging. One recent study by professor Rebekah Russell-Bennett found that people played a gamified app five times more than they needed to in order to get a reward (Russell-Bennett 2016).

7.6 Game Dynamics

Game designers often struggle to write documents that convey dynamics but they are almost impossible to capture in text form. Diagrams help, as do maps and spreadsheets, but the fact remains that the actual dynamic often remains elusive. It needs to be prototyped before anyone (including the people working on it) has the realization that it's working or not.

Game dynamics govern the breadth of actions, the pace of activity, and the speed of the game. They establish rhythm and tone, which if done well can give the game a unique signature. The balance of dynamics in a well-working game doesn`t come easy, due to the fact there probably many games that use the same actions and world structure. That success comes from the tone set by the game dynamics.

- **Building relationship**

  Rather than suggesting the points are the primary reward, the player presents an opportunity to build upon a social relationship as the main motivator. This is a similar positioning seen in many popular social games, where players can catch up with friends as you kick their butts or on the contrary team up in a game. Taking it a step further and offering both parties added synergies in gameplay will enforce the link, emphasizing the importance of the relationship.

  Some of the most popular games support collaborations. To progress quickly through the games, you need to help other players, and they need to help you. Such collaborations, according to game designers and users, foster a sense of community in an often-splintered world. Individuals differ enormously in what

makes them happy—for some competition, winning and wealth are the greatest sources of happiness, but for others, feeling competent or socializing may be more satisfying.

- **Types of interaction**
  A game can provide at least three types of interaction. First, the game can react to player actions. This is bread and butter for many games.

  Second, games can interact with themselves. Different pieces work together in interesting ways, and rules can yield unexpected results. This might not sound very interactive as far as the player is concerned but discovering these interactions can be a great source of pleasure. Games with even moderately complex internal interactions can serve as fun puzzles for players to solve.

  The third type, player–player interaction, is where games shine. Most games provide a framework in which players interact with each other. Even though many players get excited about fancy bits, beautiful artwork, and novel mechanics, it's the interaction that brings friends around a table to share an experience together.

- **Narrative environments**
  Narrative is the larger narrated story. This can exist without a plot or as a larger system in which plot exists. Narrative does not necessarily require a causal chain. It could be a history of events or sequence, and technically the level progression in a game could be a narrative. A game's narrative is the aspects of a game that contributes to it telling a story.

  Questions concerning whether games are narratives, or whether narrative provides just one way to look at games are still actively debated.

7.7 Embedded Narrative

- Pre-generated narrative content that exists prior to a player's interaction with the game.
- Cut scenes, back story.
- Are often used to provide the fictional background for the game, motivation for actions in the game, and development of story arc.

7.8 Emergent Narrative

- Arises from the player's interaction with the game world, designed levels, and rule structure.
- Moment-by-moment play in the game creates this emergent narrative.
- Varies from play session to play session, depending on user's actions.

Game design offers a number of design solutions. Among them
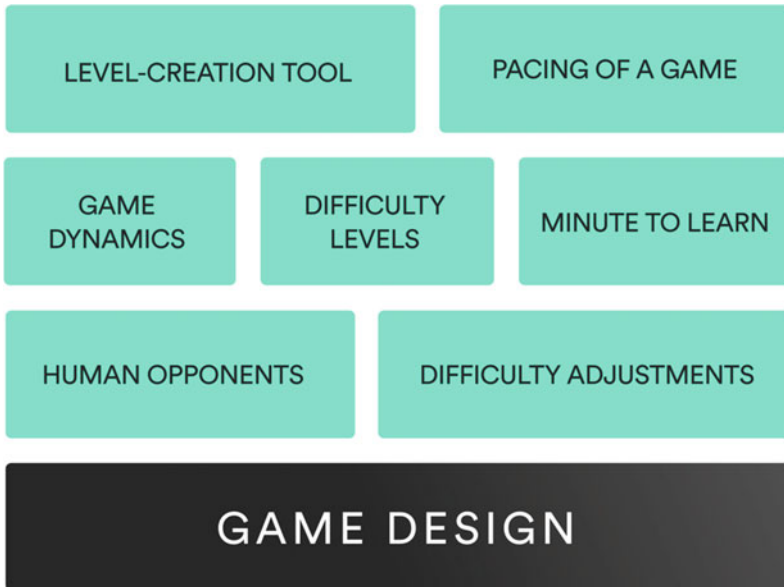
- **Pacing of a game** is increasing difficulty as the game progresses. As the player gets better, they get access to more difficult levels or areas in a game. This is common with level-based games.
- **Difficulty levels** or handicaps, where better players can choose to face more difficult challenges.
- **Dynamic Difficulty Adjustment** (DDA), a kind of feedback loop where the game adjusts its difficulty during play based on the performance of the player.
- **Human opponents** as opposition. Sure, you can get better at the game, but if your opponent is also getting better, the game can still remain challenging if it has sufficient depth.
- **Level-creation tools**, such as new levels made by player-created expert challenges.
- **Minute to learn,** lifetime to master supports multiple layers of understanding (the quality that so many strategy games strive for).
- **Game dynamics** as they set the tone of a game and serve to empower and constrain the player in specific ways, and the results can be very engaging.

7.9 Game Theory—And It's Not Gamification

It is to be noted that game design and gamification design are mistakenly taken as the same thing, though both are different from each other, and hence should be handled in a different way.

The game theory analyzes the strategic situations where a user's strategy is based on the strategic choices of others. Prisoner's dilemma is an ideal game theory situation. A classic game theory equilibrium occurs when all the game players minimize their respective losses and maximize the gains. The min (max) is done based on how the competition is going to act (Barr et al. 2007).

On the other hand, the gamification is about using the game experience to make people more engaged. It uses the rewards to motivate the desired behaviors. Gamification is applied in many real-life contexts. For instance, just as the children are asked what they like more: studies or games? Indeed, the answer is going to be "the game". Why? This is what the gamification tends to answer and that's what it attempts to do. The concept tends to provide the notions that can be implemented to develop a game-like experience (Shaffer 2015).

Gamification uses the competitive game-playing instincts in order to influence and transform behavior via game systems. It includes elements like scoring and achievement levels to the things where such game elements are not usually found. Numbers become the users' motivators. It implies that gamification is not the same as game theory, which probes strategy and motivations (Zhang 2013). Gamification functions on an individual level (self-motivation) and in a group (competition). It works with a single or more persons, based on the type of application that is developed and the rewards that are offered.

Game theory is the study of the interdependent rational choice, and not independent. In simple words, it is the people who make strategic decisions based on the way they think someone in a team would respond to their decisions. Game theory is more about the choices and outcomes (Leonard 2010).

If there are two or more persons working toward a specific goal, game theory is applicable. They would use rationalization for making decisions based on the potential outcomes all while assuming that others are involved in doing the same. There is a competition whether it is just to get the highest score or even better, a zero-sum game where there is just a limited reward available to win. In this case, one player wins the same amount the others lose, and sum of the game is zero. It's a simple transfer of the total variable from one player to another.

7.10 Game Theory as a Tree

Game theory can also be illustrated like a tree, where every decision is a branch and we weight the alternatives. One decision takes to a new decisions' set. This is for the sequential games where there is more than a single choice is available to be taken for the resulting outcome.
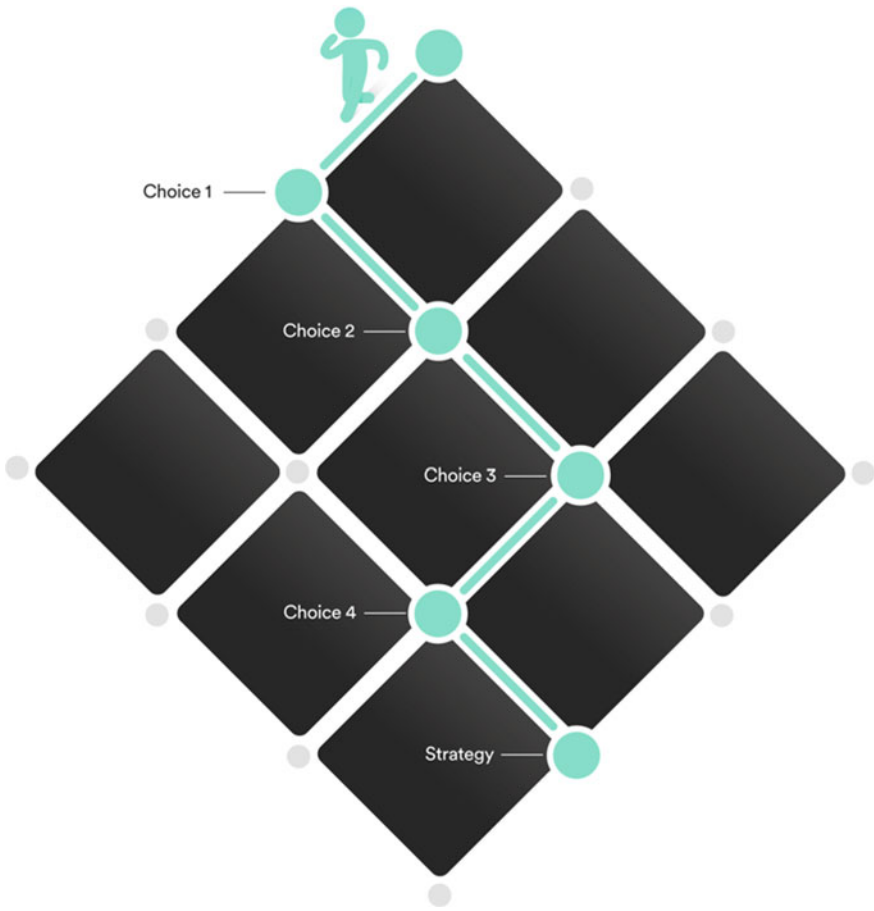
This shows a player as an example. The player needs to make choices regarding which paths to pursue, with every choice taking onto a diverse set of options. The player cannot go back and amend his choices; hence, he/she must think in a strategic way so that he/she ends up with the best possible outcomes.

This tree structure as shown above is handy when a game is ongoing, and you are taking decisions early on that are going to impact the decisions you would be able to take later. You try to think in a strategic manner and map out the optimal route.

7.11   Game-Inspired Design

It was previously called gameful (playful) design but now it has more gamification like connotations. In gameful design, no actual game elements are used, only ideas. Game-inspired designs are the attempts to utilize the engaging game traits to enhance engagement in the non-game contexts. For instance, when used in classrooms, the game-inspired design tends to transform the place from a traditional classroom to a game that students play. Rather than taking the elements of game out of the contexts (like in gamification) or wasting the class time learning the way to play commercial games (like in the game-based learning), students are treated as the players in the classroom. This shift in the perspective lets the teacher plan for diverse kinds of players and what motivates them in the gaming world (Scanlon et al. 2007). Fundamentally, if there is no meaning for an individual player in a game, they will not play. It enhances the present educational reform models with blending learning, flipped class, etc.

The rule development and victory conditions in a game-inspired design could be based on the following common principles:
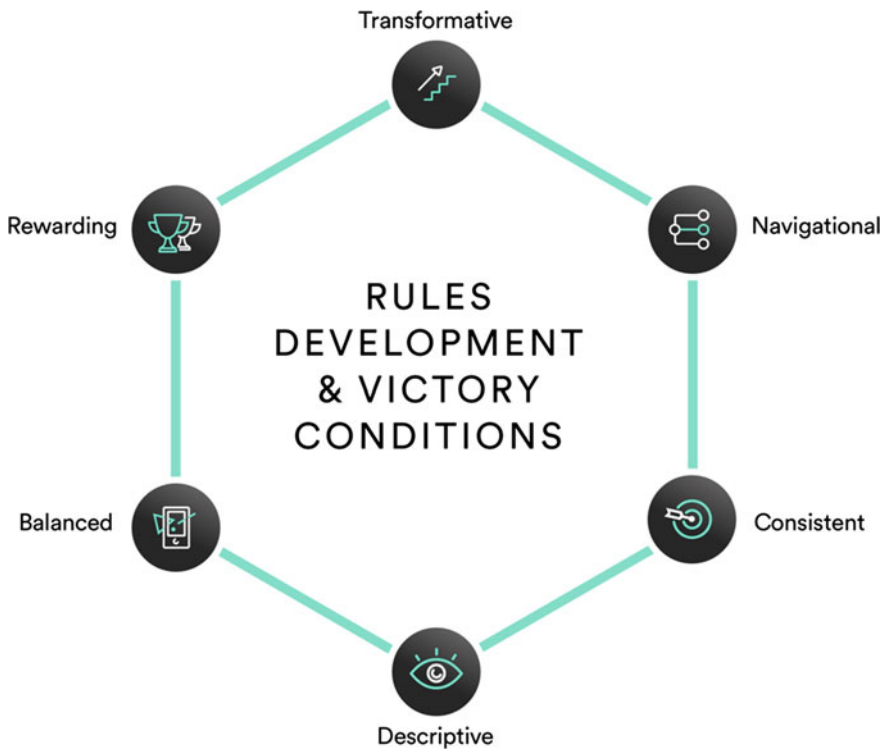
- **Transformative**: Go from simple to complex. In the start of the gamified experience, don't include numerous levels packed full of different elements. Starting with simple levels and slowly adding complexity leads to meaningful storytelling, which simplifies user entry as well as engagement. Especially important if it is about developing a specific skill-building or influence behavior.
- **Navigational**: Pay extra attention to navigation. Develop levels that don't confuse the players.
- **Consistent**: Avoid the game elements that are inconsistent with the game design.
- **Descriptive**: Include a concise description at every stage as conciseness helps achieve the engagement and retention of the players.
- **Rewarding**: Include clear victory conditions, with escalating rewards with every stage ahead.
- **Balanced**: Balance the game elements before publishing the product.

7.12　Game Player in a Wider Context

User-centered design is a framework of processes that puts the user, and their goals, at the center of the design and development process. It strives to develop products that are tightly aligned with the user's needs. Game designers and gamification designers who adopt the user-centered design philosophy in their daily work pay attention to the user's goals and strive to build products that help the user achieve them in an efficient, effective, and satisfactory manner.

While effectiveness, efficiency, and satisfaction are worthy goals, games and gamification extend and add increased engagement to these goals. In the context of a game, we have argued that millennials and younger voluntarily seek challenges to enhance their playing experience. They seek empowerment over efficiency, delight and fun over mere satisfaction. These factors increase their level of engagement.

Game design is the process of developing the rules and content in the pre-production stage and developing the gameplay, environment, storyline, and characters in the production stage. The game designer of a game is very much like the film director of a film or the creative director for an application; the designer is the visionary of the game and controls the artistic and technical elements of the game in fulfillment of their vision. Gameplay is the interactive aspects of video game design. Gameplay involves player interaction with the game, usually for the purpose of entertainment, education, or training (Bethke 2003). The player-centered design approach is used to understand the player and his/her context. The success of your gamification efforts depends on this clear understanding.

7.13   Conclusion

Game design is related to the strategic decision-making. Game is a rule-based setting with variable and quantifiable outcomes, players affecting the outcomes and the associated activities they pass through and decisions they make. Games are used for various purposes, including entertainment, serious games, experiential learning, persuasive games, etc. Game thinking is the application of games and game-like methods to develop better experiences and solve issues in playful designs, gamification settings, and simulation settings. In terms of game design frameworks, each game has elements, which in turn has dynamics, mechanics (the highest level elements), and components (the lowest level elements). Goal-setting theory in gamification explains how to motivate people to perform better in work-related tasks by setting and monitoring goals. Constraints let the player know the boundaries of the game world and also play a role in AI behavior setting and changes. Games and gamified settings must have clearly defined success criteria as it develops expectations and engages more gamers. Incentives that reward success can be intrinsic, embedded, or external and must be balanced. Game dynamics determine the breadth of actions, the pace of activity, and the speed of the game. In terms of interactivity, the game can react to player actions as well as with themselves. Game theory is based on interdependent rational choice, and not independent; the people who make strategic decisions based on the way they think someone in a team would respond to their decisions, and thus is not gamification. Game theory is like a tree, where every decision is a branch with weighted alternatives.

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Chapter 8
Visual Aesthetics in Games and Gamification

Abstract Gamification brings the possibility of novel form and expression via visual aesthetics of interactive nature. Gamification can be seen as the communication form that results in active user engagement and participation through the visual aesthetics and the game-like experiences it accommodates. While current interactive designs expand a number of digital technologies genres, the use of gamification excels the process of taking audience as the subject matter and visually engage. Thus, the audience can react to the aesthetics the goal of behavioral change comes into play due to the application of game aesthetics, game design, and gamification elements. However, in doing so, most of the users are not always able to see the complete design in the user experience or interface that could be misleading or just involved around certain commercial purposes. We call it dark patterns; a modern tactic used by user experience designers and gamification designers to make the interface visually misleading to serve their own interests and not the users. It presents the two diverse perspectives of the use of visual aesthetics in games and gamification; one is positive and another is negative. This chapter highlights the visual aesthetics and related elements of these genres, associated principles, and notions on important implications for the gamification designers to be considered in their practices and future projects.

Keywords Game aesthetics · Visual elements · Color · Tone · Mood · User interface · Juicy interface feedback · Implications · Dark patterns · Visible examples · Invisible examples

8.1 Introduction

The analysis of visual aesthetics provides structure aimed at showing how games attribute aesthetical value to gameplay and how elements of visual design and game design combine their inherent qualities to form a game. By expanding our idea of what makes an engaging game, we can create more interesting, diverse, and effective experiences.

8.2 Game Aesthetics

Game aesthetics refers to the sensory phenomena that the player encounters in the game (visual, aural, haptic, and embodied). Game aesthetics refers to those aspects of games that are shared with other art forms (and thus provides a means of generalizing about art). Game aesthetics is an expression of the game experienced as pleasure, emotion, sociability, forgiving, etc. (with reference to "the aesthetic experience").

Aesthetic experiences are a huge part of the gameplay experience. A game that may be "just okay" from a gameplay perspective can be elevated by strong aesthetics. This fact can be a plus in learning games where content might be a bit dry, but a great theme and aesthetics can help create an enjoyable experience. Aesthetics do several things for you in a game (any game—including serious games).

For example:

- Set a mood and reinforce a theme or a concept.
- Immerse the player into the game experience and help them suspend reality so they can play the game.
- Offer cues that can guide performance and communicate a player's status and progress.
- Facilitate understanding of gameplay, making it easier for a player to figure out what to do.

The key here is to use elements of game design (fun, motivation, and reward) to get users to do something that is in their benefit (and deepens your business goals). Whether the games themselves are art or not can be debated (Pratt 2010), but in terms of visual aesthetics, games surely borrow from both applied and art. The pleasure of the visual representation of a virtual world is found exclusively in its aesthetic beauty. Such aesthetics don't have functionality in the game itself, or the decision of whether to apply complex real-time algorithms, will not alter the rules of the game. So, it can be inferred that one of the reasons the hugely complex and accurate visuals are there, just because they are nice to look at.

8.3 Visual Elements in a Game

- **Color**

The visual element of color has the strongest effect on our emotions and thus gamified experiences. It is the element we use to create the mood or atmosphere of the game.

There are many different approaches to the use of color in games and gamification experiences:
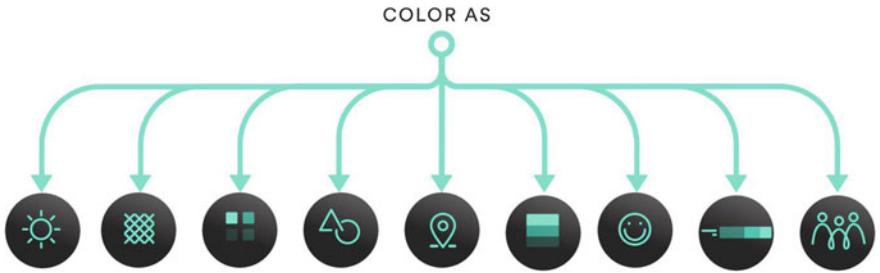
COLOR AS

- Color as light,
- Color as tone,
- Color as pattern,
- Color as form,
- Color as symbol,
- Color as movement,
- Color as harmony,
- Color as contrast, and
- Color as mood.

- **Tone**

In some designs, light tones of black hue are dominated while in some designs dark tones of black hue are dominated. Moreover, in some designs the overall environment gets darker or lighter. So, while controlling the gray scale, instead of real reflective control, incident control and exposure are used. Tone shows the designer's feelings toward the theme.

In games, tone can

TONES

Object Representation   Emotional Design   Practical Cases
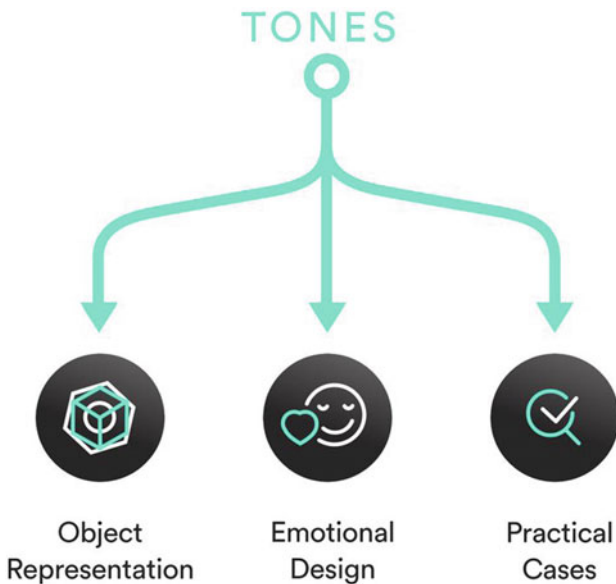
- be used to represent things, objects, people, or places in descriptive or symbolic ways,
- communicate emotions, feelings, or ideas and appeal to our senses, and
- be used for practical purposes.

- **Mood**

Mood is the resulting emotional atmosphere produced by the tone. Mood is typically described in terms of emotions, all of which may fade in and out of focus at various points in the game. The choice comes down to mood. Let's say our mood is "shallow, disappointing, and lonely; the struggle up the ladder will not bring happiness." In this case, having bleak, desaturated colors are the way to go, but if the mood was actually "persistent, victorious, and powerful: you'll fight a hard fight, but the spoils will be yours!" and vibrant colors would better illustrate the triumph and colorfulness of the experience. Mood can be used in game design to direct the player and in storytelling to elicit emotions. Using immersive methods can increase the effect that storytelling has on the player's mood. Emotions, anticipation, and stakes can be utilized to enhance the storytelling (Nordian and Burns 2003).

Theories and methods that harness psychological approach in guiding or manipulating the behavior of the player can be helpful in creating immersive games. Player manipulation can include guiding the player through the game environment, using a reinforcement schedule to reward the player or creating a certain mood within a scene.

8.4   Game Feel

Juicy feedback is usually termed as balanced, inviting, tactile, continuous, emergent, coherent, repeatable, and fresh. It is the kind of feedback that is recurring always, and the player feels it and doesn't have to do much to activate it. It is surprising and always brings something new. These keywords are valuable to keep in mind throughout the design process, for focusing what exactly you want your feedback to do.

Feedback is an important element in any type of content gamification because feedback informs the learner of the level of correctness of his or her actions while simultaneously providing interest, immersion, and guidance. Juicy feedback is the idea of designing for visceral reactions in the users, so they experience emotions. A juicy experience is engaging from the moment you begin until the moment you end.

Game juice is a pretty wide yet specific concept. As the term suggests, juicing is about taking a game that works and adding layers of satisfaction to improve game feel. Satisfaction is created by the senses; every visual and auditory input has the ability to make something that is virtual work in a way that is more believable. It's not the art of realism, but more the art of illusion that leads a game to become juicy. As a designer, it's as if you squeezed the juice out of an already appetizing fruit.

You can probably sense that beneath that catchy word lies a powerful game design concept. It is a specific lens designer can use to push our games' feel further.

Game juicing is often presented as a collection of tricks you can use to better the sensations of your player. It is not a matter of using prebuilt formulas though. Your game's juice should always echo your core gameplay. We cannot improve our game's feel randomly. Screen shake, squash and stretch, bounciness, and other fast-paced animations are only relevant in specific situations! They make sense in dynamic games.

8.5   Game Interfaces

User interface design in games is different from other designs as it involves an added element, fiction. Physical interaction methods and immersive technology such as Virtual Reality (VR) headsets promise to challenge game UI design, allowing for a stronger connection between the avatar and character as both engage in similar actions at the same time. Technology provides an opportunity for deeper levels of interaction with the addition of audio and haptic elements (Bardzell et al. 2010). The fiction is based on an avatar of the actual user or player. The player is invisible, but main element to the story, much like a narrator in a novel or film.

Game UI holds a key advantage (or disadvantage from some perspectives) in that players are often engaged with the narrative and/or game mechanic enough for them to learn new interaction patterns or forgive bad ones. This is likely the reason so many games have bad UI, as testing needs to encompass the core game mechanic while UI is seen as secondary.

We don't want to transform all our products into game-like experiences. Instead, we try to learn from an industry for gaining an extremely engaged audience. Gamification designers shouldn't blindly use the mentioned visual aesthetic concepts; rather, they should adapt them to their needs and to the platforms on which they deliver their products, without compromising with the quality of the products. Gamification is not something to be applied after designing and developing your product. Gamification is a part of a design process itself.

8.6   Implications for Designers

A better understanding of aspects of visual techniques that are shared with game interfaces will lead to richer experiences, and may require a rethinking of established design structures and the roles of designers, because, as we'll see, making bridges between art, tech, and ethics has implications for gamification designers too.

Worth mentioning is the dark patterns in user experience designs and the importance to think beyond providing aesthetics and usability to our users. Dark patterns are deceptive interactions, designed to mislead or trick users to make them

do something they don't want to do. The patterns are productive only for one party, exploits human weaknesses, and are difficult to identify and not always visible. Businesses and designers use dark patterns for commercial purposes including generating more leads, get subscriptions, hitting targeted number of transactions, etc. To grow their businesses, they create deceiving user interfaces and gamification settings to manipulate users.

Dark patterns have been around for as long as we can remember; they aren't limited to applications. For example, some credit card statements boast a 0% balance transfer but don't make it clear that the percentage will shoot up to a much higher number unless the user navigates a long-term agreement in tiny print "In terms", and dark patterns are much more complex and sneakier in nature. Brownlee (2015) illustrates a key example of that through LinkedIn and its automated follow-up email reminders on a new user's behalf to any contacts harvested from his or her mail accounts, which are presented in such a way that they appear as if they came directly from the user.

Harry Brignull (2010) listed 11 types of dark patterns:

- Bait and Switch,
- Disguised Ads,
- Forced Continuity,
- Friend Spam,
- Hidden Costs,
- Misdirection,
- Price Comparison Prevention,
- Privacy Zuckering,
- Roach Motel,
- Sneak into Basket, and
- Trick Questions.

Brignull says that when you use an application, you don't read every word on every page, you skim read and make assumptions. If a company wants to trick you into doing something, they can take advantage of it by making a page aesthetically look like it is saying one thing when in fact it is saying another.

Dark design patterns use all of the powers of visual design with the flair of a magician's misdirection, and the language of a shady sideshow barker (dare you to say "shady sideshow barker" eight times in a row). These patterns are in direct opposition to concepts we celebrate in design, such as empathy, human or user centered, and inclusivity. Dark patterns rob customers of their agency.

What are the consequences of our actions? What ethical considerations should designers weigh when they develop a new product? Many of us are in conflict with executive strategies we are asked to implement on the job that we feel we cannot influence or change. With whom does the burden lie for what we create and how it is used? While experts are unanimous about dark patterns—they don't like them and can point to countless examples of how they poison customer loyalty—no one believes they are going anywhere just yet.

Critics recommend that designers take time to define a personal manifesto that outlines their values. What matters most to you? How is your work reflective of these values? We believe that making a commitment to understanding the nature of change (hint: it's incremental, and facts don't persuade people), practicing active listening skills, and building communication skills can help professionals reframe the conversations around them.

- **Visible and invisible examples of dark patterns**

Manipulative timing is a core feature of dark pattern design. Interruptions usually pile on the cognitive overload—and misleading design deploys them to make it more difficult for a user to be in control of their abilities during an important moment of decision (Andrade et al. 2016). Dark patterns get consent to gather users' personal data often with unwelcomed interruption with a built-in escape route —leading to a way to get rid of the dull (desaturated) looking menu getting in the way of what you're actually trying to do. Brightly colored "I agree and continue" buttons are a recurrent feature of dark pattern design. These striking signposts appear universally across consent flows—to inspire users not to read or anticipate a service's terms and conditions, and so not to understand what they're agreeing to (Challco et al. 2015).

- **The future of the dark patterns—Is it actually going to be "light pattern design"?**

What is "light pattern design?" The way forward, at least where consent and privacy are concerned is likely to more user centric. This implies genuinely asking for consent and by using honesty to win trust by enabling instead of disabling user agency (Huotari and Hamari 2012).

UX and gamification designs must champion usability and clarity in the use of aesthetics, presenting a genuine, good faith choice. Which means no privacy-hostile defaults: so, opt ins, not opt outs, and consent that is freely given because it's based on genuine information not self-serving deception, and because it can also always be revoked at will (Jeong and Lee 2015). Design must also be empathetic. It must understand and be sensitive to diversity, offering clear options without being intentionally overwhelming. The goal is to close the perception gap between what's being offered and what the customer thinks they're getting.

8.7   Conclusion

The design approaches used in games serve secondary purposes and in their application in the game design leads to emergence of aesthetic value and visual narratives. The visuals and aesthetics in games not only form the structure that shows how games consider aesthetic value for the gameplay but also how these combine the games' inherent qualities to create interesting, engaging, and

immersive experiences. The opposite of the same is also present. The rising dark patterns in user experience design and gamification in terms of visual aesthetics are deceptive UX/UI interactions that designers create to trick players or users to persuade them to do something that is not in their interest. Aesthetic experiences including visual elements like color, mood, tone, and user interfaces, game feel, etc. make a huge part of the gameplay and gamification design. However, the dark design patterns use all these visual elements in direct opposition to concepts we embrace in design, like empathy, inclusivity, or being human/user centered. This brings serious implications not only for the games and game-based experiences but also for the UX/UI designers as well. The dark UX patterns are no more hidden; they are visible and poison customer loyalty. It is the time for the designers to have a clear line in between visual aesthetics and dark patterns and develop a personal manifesto that outlines the desired values, empathy, and sensitivity to diversity.

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Chapter 9
Timings in Games and Gamification

Abstract Most of the games we see today have some concept of time progression. For real-time games, the time progression and decisions are usually measuring and taken in a fraction of a second. Time constraints are also an essential component of game and gamification development. Timings in games and gamification projects stimulate creative thinking, best shots on timings, smart decision-making, and quick outcomes. This chapter discusses the timings in games and gamification, the related theories, factors, implications, outcomes, and advantages.

Keywords Feedback · Positive feedback · Negative feedback · User retention · Response time · Time constraints · Effects on timing · Decision theory · Construal theory · Decision-making · Blind decisions · Meaningless decisions · Dilemmas · Flow

9.1   Introduction

When creating a game, you tend to start with a basic idea. It may just be a theme you wish to explore, it could be an interesting mechanic you want to flesh out into a full game, or you could have the whole game in your head start to finish. However, the idea starts life, and you pursue it because you think it will be enjoyable for you or others to play. You then start to put the idea together into something coherent. You prototype the basic mechanics and game elements. We often use the buzzword "interactivity" when describing games when we actually mean "decision-making." Decisions are, in essence, what players do in a game. Remove all decisions and you have a movie or some other linear activity, not a game. There are two important exceptions, games which have no decisions at all: some children's games and some gambling games. For gambling games, it makes sense that a lack of decision is tolerable. The "fun" of the game comes from the thrill of possibly winning or losing large sums of money; remove that aspect and most gambling games that lack decisions suddenly lose their charm.

There are essentially two fundamental sorts of contingencies; ratios and intervals. Ratio schedules provide rewards after a certain number of actions have been completed. For example, a player might gain an extra life after collecting 20 coins. This would be called a "fixed ratio" schedule because the same number of coins is required every time.

This is one of the most common contingencies found in games, fixed ratio schedules typically produce a very distinct pattern in the participant. First, there is a long pause, then a steady burst of activity as fast as possible until a reward is given. This makes sense when one considers that the very first action never brings a reward, so there is little incentive to make that first collecting. Once participants decide to go for the reward, they act as fast as they can to bring the reward quickly. The distinct pause shown under a fixed ratio schedule can be a real issue for game designers. Having a period of time where there is little incentive to play the game can lead to the player walking away. Additionally, the length of the pause is a function of the size of the ratio (the number of actions required), so more actions required the longer pause. This means that if the ratio increases over time, such as the increasing number of experience points required to gain a level up, so does the pause. Eventually, the pause can become infinite, and the player simply decides it's not worth it.

On the other side of the coin, there are interval schedules. Instead of providing a reward after a certain number of actions, interval schedules provide a reward after a certain amount of time has passed. In a "fixed interval" schedule, the first response after a set period of time produces a reward. For example, the game might introduce a power-up into the playing field 10 min after the player collected the last one.

When creating a gamified system, you start with an objective. This may be employee engagement; it may be increasing sales of a product. However, the goal is to meet that objective. Next, depending on how you feel you can best meet that objective, you start to design your system. First and foremost, in many systems will be the metrics you need to collect. The metrics are what will allow you to know if you are on target to meet the objective or not.

You consider what gamification elements and mechanics will best help you achieve the goal and start to put them into your system. You will probably consider how different user types react to different elements and experiment with them on test groups of users. Using the metrics, you are collecting you will balance the system to drive the best and most efficient results you can. After multiple iterations, you release the product. You measure success by how many people reach your original objective.

It looks from this like there is no middle ground at all. Game design starts from the desire to make something that people will enjoy. In gamification design, you are making something that will achieve a goal. In game design, metrics are not always a focus of a game—at least at the initial conception. In gamification design, metrics are what your system will live and die for.

9.2   Feedback

A kind of dynamic often visible in games and is of much importance is called the feedback loop. Two kinds of feedbacks are there; positive feedback loops and negative feedback loops. These ideas have been taken from other fields like control systems and biology, and they demonstrate the same thing in games that they mean elsewhere (Ryu and Bae 2013).

A positive feedback loop is taken as a reinforcing relationship. Something occurs that results in the same thing to occur again, which results to happen yet again, getting stronger in every iteration—just like a snowball that begins small at the top of the hill and then gets faster and bigger as it rolls and accumulates more snow.

There are three properties of positive feedback loops that game designers should be aware of:

- Puts emphasis on the early game since the effects of early-game decisions are magnified over time.
- Tend to destabilize the relationship with the game, as one player gets further and further ahead (or behind).
- Cause the game to end faster.

A negative feedback loop is a balancing relationship. When something happens in the game (such as one player gaining an advantage over the others), a negative feedback loop makes it harder for that same thing to happen again. If one player gets in the lead, a negative feedback loop makes it easier for the opponents to catch up (and harder for a winning player to extend their lead).

Negative feedback loops bear three important properties:

- They may stabilize the game, causing players to lead toward the center of the pack.
- They make game to consume more time.
- They put focus on the late game, as early-game decisions are decreased in their impact with time players are going to perceive the game? Of course, a Playtest is the answer.

The thing that is usually confusing to people is that both of the conditions are "positive" feedback loops. This may appear as counterintuitive; the second example appears very "negative," as the player is not doing good and getting fewer rewards. It is "positive" in the sense that the impacts get higher in magnitude on every iteration.

9.3 How Is It Implemented?

A feedback loop is a powerful way to keep a user coming back to your product and taps into what we discussed in chapter two; dopamine which is an organic chemical that plays an important role in your day-to-day brain functions. And, dopamine loop is frequently seen in a feedback loop of gamification settings. There are several ways extrinsic motivational affordances lead to dopamine-driven feedback loop:

- Closer alignment with users' intrinsic motivations produces greater satisfaction.
- Research suggests that this alignment also produces higher quality outcomes (particularly when we measure tasks that require a great deal of sophisticated thinking and perseverance).
- We need to know what rewards players will value so that we can focus our efforts and capital on useful incentives.

The introduction of carefully selected extrinsic rewards, built around a design that speaks to intrinsic motivational states (sometimes not the ones most closely aligned with the behavior we seek to change), is the most powerful design model we have today.

Good gamification design seeks to understand and align an organization's objectives with a player's intrinsic motivation. Then, through the use of extrinsic rewards and intrinsically satisfying design, move the player through their journey of mastery. This journey requires elements such as desire, incentive, challenge, reward, and feedback to create engagement.

9.4   User Retention

The user time in the gameplay and gamification experience bears important consequences for the project to be successful. User retention is one of the most important key performance metrics, which potentially keeps your game running for years and bring continual streams of revenue.

The interest of using game mechanics to increase user retention and activity is growing fast in the interaction design, user experience, and digital marketing business. Some people state that user retention is the single most important metric while analyzing the user lifecycle in Freemium apps and free-to-play games. It is a direct factor when calculating the lifetime customer value and also indication of the general application quality and user experience. Some sources even state that it's 6–7 times as expensive to acquire new users than to retain old ones making user retention very profitable for all companies. For instance, a points system is a common loyalty program. Customers earn points based on their behaviors, which translates into rewards. This method works well for businesses that promote frequent, short-term purchases.

9.5   Response Time

A lot of users don't gradually return to a new game or gamified app and may need a little convincing. The response time incorporated within the game can turn the table. The response time must be perfect. Push notifications serve as a great means to call users back to a game after they've left. Some games prompt users to "Come back and play" or state the messages like "Your team hasn't forgotten their leader!" (Binmore 2013).

This passive approach doesn't always tap on users' motivation to come back to a game. Even more operative push notifications come straight from the game's core loop and call users to come back and continue great gameplay sessions.

The message is highly effective for several reasons:

- Urgent: there is only 1 min to act before the event is over.
- Concrete: users know exactly what is requested from them (as opposed to a generic "come back and play").
- Motivating: not complying with this notification means a possible loss of the progress made in the event.

Another effective push notification scheme is one that fills a gap of knowledge, like "Your event results are in! Tap to see what you've won." Both notification schemes are a direct cause of player actions—and that's what makes them so enticing.

9.6 Time Constraints

Time constraints though are parts of every game, yet they are not always visible. Time constraints in games possess varying degrees, based on several factors. We will first take into consideration some related examples in this regard.

Time constraints, for instance, is when the player is asked to decide, along with provided choices. While the player decides, the progress meter is turned on that pushes the player to make probably not the best response if he or she doesn't choose the option. In the game context, this pushes the game designer to often follow the gut instinct and ignore long considered or delayed decisions. This results in a feeling of drama and in certain vases real dread, usually the choices are all apparently negative as you are compelled to select what is the least bad.

Then, we have an example of another game design, where there is a timer ticking at the screen. Though for a bigger percentage of the game context, it has nothing to do much as the players are provided with enough time to complete the level, but

after they decide to collect everything needed on a level, they often come to know shortage of time and thus become more desperate to reach the finish line as fast as they can.

These are the clear examples of the time constraints and the pressure they bring, on decision-making. Seeing a timer will push you to reach a certain point faster. Games exhibit many other kinds of time constraints, like how do you respond when being short at, how you are going to run away when being chased, and how to move from one side of the map to another. These types of pressure push fast thinking, rapid reflex action, and surely don't encourage the creative and considered solutions, as mentioned in the beginning of this chapter. However, these types of moments usually feel more emotional and co-relatable, as they hold more meaning in that split second.

9.7   The Effects of Timing

The effects of the timing can be explained, by analyzing the last sections of this chapter as well as the following theories. These theories also signify why time constraints bring better results in the context of game and gamification designs.

People make decisions based on available information, time, etc. Basically, given a set of choices, your mind filters through all of the information available. Over time the probability of each choice "winning" changes until either time runs out or there is only one choice left in mind. The key thing for considering time pressure on decision-making is that changing the amount of time given for a decision to be made can dramatically change the outcome.

- **Decision theory**

An extensive research has been conducted on how people make decisions, and one of the prominent studies is Decision Field Theory, which was developed by Jerome R. Busemeyer and James T. Townsend in 1993. Their paper was published in which they mentioned the way people make decisions, on the basis of time, circumstances, and available information. With time, the chance of every choice "winning" is changed till the time falls short of or there is only one option left. Based on the time pressure's effect seen on decision-making, it can be concluded that by changing the time given for deciding, the outcome can be changed. The below diagram shows the same situation. The vertical line at the end exhibits a decision having its natural deadline, which is around 2 s. Here, option A is the clear winner. If we cut this time in half, the option C is going to be the winner.
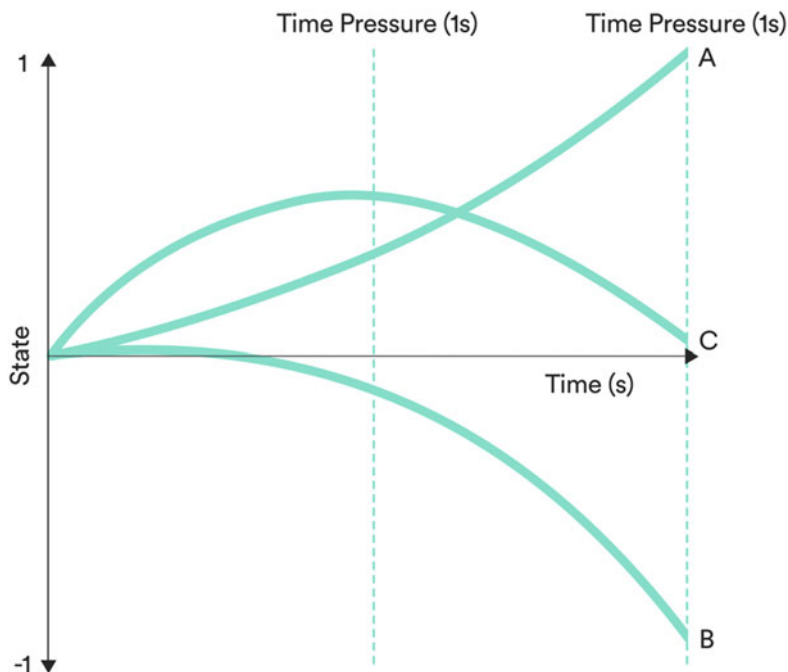
This, indeed, doesn't confirm if option A was better or worse than the option C. The only difference is that option A seems a more considered option. In fact, it might well be wrong, as the details you had when option C was better might be more accurate than the details you got at option A. You might have wondered yourself about option C on basis of certain type of personal bias you were not consciously aware of. All kinds of things change every option's validity. Going back to brainstorming a game, in reality, the little time is provided for idea development maybe, doesn't lead to better ideas. It actually gives you an opportunity to make more ideas without any of your natural bias, instead the ideas that are surely better. After that, you can have to be a more creative and considered.

- **Construal theory**

The construal level theory differentiates between abstract and concrete perceptions during decision-making process. Time is not only a factor that affects your decision. Another interesting element of decision-making is the way how things are perceived. Trope and Liberman (1998) published a paper "Temporal Construal Theory", which later was included in Construal Level Theory of Psychological Distance (CLT) (2010). The theory proposed that we think about the things on the basis of the psychological distance between us and the thing. This can be a physical distance, social distance, temporal (time) distance, etc. The farther the experience is from the thing, the higher the degree of perception or construal is. The close the thing is to the experience, the lesser the degree of construal is. This is the difference between considered how a thing should be done and how exactly it is being done.

These are obvious examples of time pressure on decision-making, you can see a timer and know it will run out at a certain point. Games offer many other types of time constraints, from how you react to people coming after you, to how you are going to get from one side of a map to the other as you are being chased. These kinds of pressures force fast thinking, reflex action, and definitely don't encourage considered or creative solutions. But, these kinds of moments often feel more "real" and emotional, and they have more meaning in that split second.

Nicolas Matthews provided an example of this in his paper named "Not to be Misconstrued" (Busemeyer and Townsend 1993). Suppose you lock a door. If this event is in future, you may consider this act as a preventive measure for home's security. This is why you would lock the door. When you are actually standing at the door with a key, you may think of how you lock that since you are in the moment; putting key in the door, turn it, and check the door. The closer the event you are the more real and concrete it becomes.

When provided with a task that has unlimited (or at least sufficient) time, you can think of considering the abstract thoughts of why. You can remove choices, make the new ones, and restate old ones. The closer you are to the point the decision has to be made, the more focused you are on how you are going to attain the given task.

9.8 Decision-Making

Before explaining good kinds of decisions and good decision-making, it is important to know some common types of decisions commonly seen in games. These terminologies, however, may not be the official jargons of games industry (Gonzalez et al. 2017).

In a game-related research by Dr. Scopelliti provided participants with personalized feedback about how biased they were during gameplay, with the opportunity to make practice decision, and to learn strategies to reduce their propensity to commit each of six well-known cognitive biases:
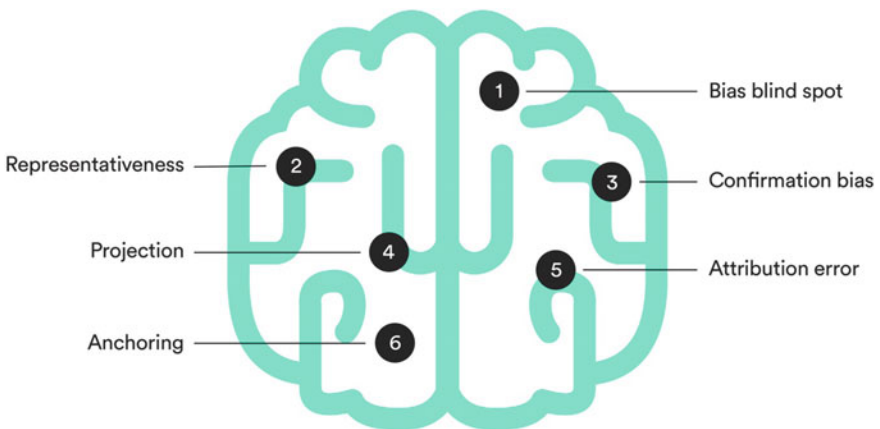
- **Bias blind spot**: seeing oneself as less susceptible to biases than other people.
- **Confirmation bias**: collecting and evaluating evidence in ways that confirm one's preconceptions.
- **Fundamental attribution error**: unduly attributing someone's behavior to their individual traits and personality rather than to situational factors.
- **Anchoring**: relying too heavily on the first piece of information available when making a judgment.
- **Projection**: assuming that other people think or behave the same way we do.
- **Representativeness**: relying on some simple and often misleading rules when estimating the probability of uncertain events.

9.9 Obvious Decisions

Obvious decisions have some effect on the game, nonetheless there is only, and clearly one right answer, so it's not really much of a choice. Mostly, the number of dices to roll in the board game may come into this category, i.e., if you are attacking with three or more armies, you make a "decision" of whether to roll 1, 2, or 3 dice… but your odds are better rolling all three, so it's not much of a decision except in some special cases. A subtler example can be a game like Trivial Pursuit. Every turn you are given a trivia question, and if you are aware of the correct answer, it could be inferred that you have a decision: say the right answer, or not. Except that there's never any reason to not say the right answer if you know it. The fun of the game comes from showing off your mastery of trivia, not from making any brilliant strategic maneuvers. This is also, I think, why quiz shows like Jeopardy! are more fun to watch than to play (Harman et al. 2017).

9.10 Blind Decisions

Blind decisions impose a radical effect on the game; however, the answer is not very obvious. In addition, now there is an additional problem, i.e., the players do not have adequate knowledge on which to make the decision, so it is fundamentally random. Playing rock–paper–scissors against a really random opponent falls into this group; your choice impacts the outcome of the game or gamified product, but you have no way of being aware of what to choose.

9.11 Meaningless Decisions

Meaningless decisions are probably the poorest type. You have a choice to make, but it has no impact on your game or gamified product. If you can play either of the two cards but both of these are same, you have not got a choice.

9.12   So, What Makes a Good Decision?

Now that we explored what makes poor decisions, the easiest answer is "don't do that!" But we can take it a little bit further. Normally, interesting decisions are based on certain type of trade-off. That is, you are giving up one thing in exchange for another. These can take many different forms. Here are some examples (Marusich et al. 2016):

- **Short term versus long term**

You can have something right now or something better later on. The player must poise instant needs against long-term goals.

- **Choice of actions**

You have numerous potential things you can do, but you can't do them all. The player must select the actions that they feel are the most significant at the time.

- **Resource trades**

You give one thing up in exchange for the another, where both are valued. Which is more valuable? This is a value judgment, and the player's aptitude to properly judge or anticipate value is what defines the game or gamified product's outcome.

- **Risk versus reward**

One choice is safe. The other choice has a possibly greater payoff, but also a higher danger of failure. Whether you select safe or dangerous is based partly on how anxious a position you're in, and partly on your study of just how safe or dangerous it is. The consequence is determined by your choice, plus a little luck as well… but over an adequate number of choices, the luck can even out, and the cleverer player will generally win. (Quick Tip: if you wish for more luck in the game or gamified product, decrease the total number of decisions.)

9.13   Dilemmas

Time is very important factor for optimal decision-making. It is one of the most important factors to think about while designing game or gamified projects. With gamification as in the games, the designers have the ability to use it to their advantage by putting time constraints on their systems that would otherwise not have them.

By having limited time to complete tasks that can limit the number of options available that can be taken into an account by the user, but by doing so might promote the most practical choices to come up with on the top. Forcing users here

will make them to take their decisions as more concrete and real, giving them more instant meaning (Lootsma 1999).

Giving enough time periods, on the other hand, let's them make more thoughtful ideas and come to more imaginative decisions, but at the same time, it may also result in people avoiding good ideas on the basis of personal bias or some other factors.

The bottom line is that time must be used in the best advantage as per the desired outcomes. If you want to inspire good practical ideas, decrease the time given. If you want to endorse creative and more intellectual thoughts, make the time longer. This is as simple as that.

9.14   Flow

A game loop runs continuously during gameplay. Each turn of the loop, it processes user input without blocking, updates the state, and renders the game. It tracks the passage of time to control the rate of gameplay. Using the wrong pattern can be worse than using no pattern at all, so this section is normally here to caution against overenthusiasm. The goal of design patterns isn't to cram as many into your design as you can.

In the 1970s, a psychologist named Mihaly Csikszentmihalyi experimentally evaluated flow. He found that a person's skill and the difficulty of a task interact to result in different cognitive and emotional states. When skill is too low and the task too hard, people become anxious. Alternatively, if the task is too easy and skill too high, people become bored. However, when skill and difficulty are roughly proportional, people enter flow states.
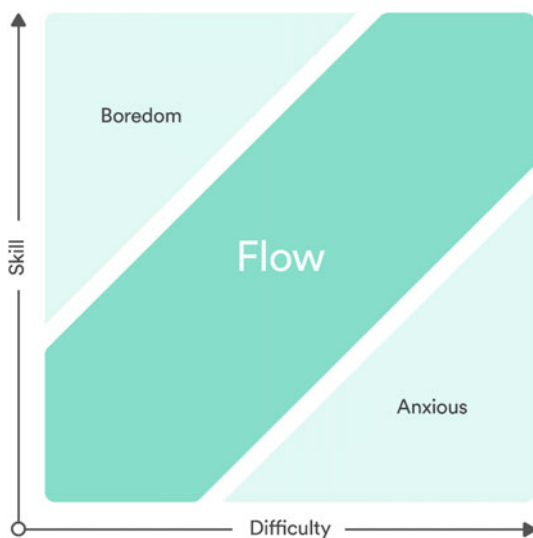
9.15   Conclusion

The interactivity in games is often translated into decision-making. Decisions are what players do in the game. In terms of timings, the fixed ratio schedules lead to unique patterns in participant decision-making and the first response after a specific span of time brings reward. Gamification is aimed to achieve certain goal, while game design doesn't necessarily focus the metrics. The games have two feedback loops; positive and negative. A positive feedback loops reinforces the relations and related activities, while negative one balances the two sides. Dopamine, an organic chemical that plays a key role in our day-to-day brain functions, makes a dopamine loop that affects feedback loop of gamification settings. User retention is important for ensuring long-lasting games, for which designers use different mechanics and create engaging user experiences. Moreover, the response time also contributes to the success of the game. Time constraints is when the player is asked to decide, along with provided with choice. As per decision theory, based on the time pressure's effect on decision-making, changing the time given for deciding changes the outcome, while construal level theory differentiates between abstract and concrete perceptions during decision-making process. Time and flow are very important factors for optimal decision-making, facilitating the passage of time to control the rate of gameplay. In gamification, this has been seen as the ideal path to take when designing your experiences.

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Chapter 10
Immersion in Games and Gamification

Abstract The term immersion and what does it imply in the context of games are the concepts psychologists, game designers have been studying for decades. Immersion is often termed as presence in the gaming world, which is of various kinds in terms of how media is perceived. The spatial presence or immersion is closest to what game designers think of as immersion. The immersion in game design is that a game creates a spatial presence when the player starts to feel that he or she is there in the world created by game. Players who experience immersion are likely to just focus on the choices that seem meaningful in the context of the imaginary world. This chapter talks about what immersion is, how it is related to game design and gamification, its purpose, effectiveness, and associated elements and concepts. It also highlights how immersion can enhance the engagement for the users.

10.1 Introduction

Games are often seen in terms of a win and loss. These are the series of increasingly intricate challenges that the user either pass or fail. Reaching that fail state puts players under a bitter few seconds before he or she is given the same problem again. This is the most basic and oldest structure of the game design. The inherent influence of a game lies in their ability to turn these rudimentary interaction principles into an authored space that impacts the senses of player. Immersion is the idea that seems to have greater frequency in the game design, but the ways to conjure it may be elusive.

10.2   Immersion

Despite differences existed in game design and appearance, most successful games have one important element in common: the ability to draw players in. This experience is referred to as "immersion", a term commonly used by gamers. Player immersion or flow may be said to be the holy grail of game design. In this highly intensive state, one is fully absorbed within the activity, and often loses one's sense of time and place, and gains powerful gratification. Nowadays, the players are not expected to just sit and watch to make passive reaction according to game content. Instead, they prefer becoming an active participant. Any kind of popular game must lead to an immersive gameplay experience that can have particularly powerful hold on player's actions and attention.

10.3   Presence Theory

What about the game and what about the game player feeling that he or she is leaving the real world behind? There are many theories around, but Werner Wirth and his team (2007), consolidated the findings and presented a unified theory:

According to the research, the spatial presence takes place in three steps:

1. Players make a representation in minds of the world or space with which the game is presenting them.
2. Players start to favor the media-based space, i.e., the game world, as their point of reference for where they are.
3. Profit.

Since presence as well as flow can be described as immersive experiences, Draper et al. suggest that presence is a particular type of flow experience that occurs during teleoperations. This is in line with Bystrom et al. who assume that presence, just like flow occurs due to a feedback loop between task characteristics and attention allocation. Alike, Hoffman and Novak propose that attention and involvement are essential components of the sensation of presence as well as the experience of flow. Despite these conceptual similarities, both concepts are used independently to describe and explain immersive experiences in the context of media use.

Hence, fundamentally, the process begins with the players creating a mental model of the game's make-believe space by observing various cues such as sounds, images, and movements as well as assumptions regarding the world that they may present. Once the mental mode of the game is formed, the player then decides, either consciously or unconsciously, whether he or she feels like he or she is in that imagined world or the real one. Indeed, it should be noted that it is not essentially a conscious decision having prefrontal cortex's stamp of approval on it. It may be subconscious, on the sly, slipped into the sideways and entered and left constantly (Wissmath et al. 2009).

Flow and presence share conceptual similarities such as an immersive component and intense feelings of involvement but there are clear differences, whereas flow can be defined as immersion or involvement in an activity (i.e., the gaming/gamified action), presence rather refers to a sense of spatial immersion in a mediated environment. In the last decades, plethora of studies have been conducted to investigate presence and flow in various media contexts. Surprisingly, however, there is not one single comprehensive empirical study that investigates the relationship between the two concepts. Within the study in hand, we therefore aim to empirically analyze the relationship between flow and (spatial) presence.

10.4   Game Characteristics Resulting in Spatial Presence

The characteristics of games which facilitate immersion are classified into two broad categories:

1 Rich mental model of the game setting

2 Consistency between the things in such setting
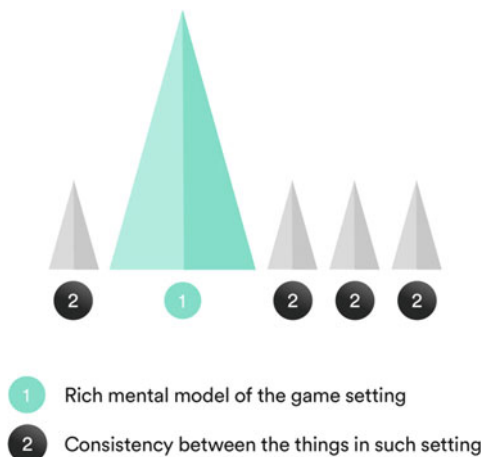
- Those that make a rich mental model of the game setting and
- Those that make consistency between the things in such setting.

Let's discuss the idea of richness that is mainly related to multiple channels of the sensory information, its completeness, cognitively demanding settings, and an interesting and impactful plot, narrative, or story.

Preliminary research on flow and games suggests that the psychological experience of gaming is consistent with the dimensions of flow experiences as outlined by Csikszentmihalyi and Rheinberg and Engeser. Thus, the concept of flow "form (s) the basis of the psychological presence of gamers within the game and provides a useful framework." The importance of flow in the context of media consumption was also pointed out by Sherry, who argues that media enjoyment is after all the result of flow experiences. According to Sherry, flow experiences especially occur while playing computer and games: "games possess ideal characteristics to create and maintain flow experiences in that the flow experience of games is brought on when the skills of the player match the difficulty of the game."

The multiple channels of sensory information imply that the more senses you target and the more such senses work in tandem, the better it is. For instance, a bird flying overhead is nice. Hearing it chattering as it does so is better. The number of dimensions also plays a role here, and it is expected that it would prevail in the modern era of spatial presence.

Completeness of the spatial information implies that the fewer blanks regarding the mental model of the game world to be filled by the player, the better it is. Contrivances and abstractions are the enemy of immersion. For instance, a game was immersive since its towns were all filled with people who seemed like they were doing some people stuff (Ermi and Mäyrä 2005). Dealing in an acquainted environment also lets the player to easily make assumptions around those blank spaces without exiting of the world to think about it.

Cognitively demanding settings where players need to focus on what's happening and getting by in the game tie up the mental resources. This is in favor for immersion, since if brainpower is assigned to navigating or understanding the world, it's not free to notice all its shortcomings or problems that would otherwise prompt them that they're playing a game. Regardless, researchers have identified several kinds of presence in regard to how we perceive media, but it's spatial presence that I think comes closest to what gamers think of as "immersion".

Briefly, spatial presence is often defined as existing when media contents are perceived as "real" in the sense that user's experience a sensation of being spatially located in the mediated environment. The idea is just that a game (or any other media from books to movies) creates spatial presence when the user starts to feel like he is "there" in the world that the game creates.

10.5   Story

An interesting and strong story, plot, or narrative serves immersion. In fact, it's pretty much the single thing in a book's toolbox for making immersion, and it works well in games too. Good stories entice the attention to the game and let the world seem more credible (Ibister 2006). They also tie up the mental resources. In terms of story, we see the following two kinds of immersion in games:
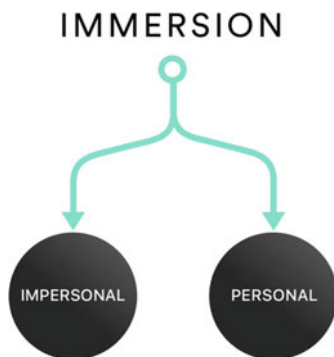
- **Impersonal Immersion**

With an impersonal immersion, players identify a specific existing character in the game, a character bearing a cohesive personality, appearance, and context that is different from that of the observer. You're looking at their story-related behavior in cutscenes, and perhaps you're reacting to events as they do, but the behavior and appearance of the characters will be more or less hardwired and you're there for the vicariously immersive ride, unless you believe that's you (Leibovitz 2014).

- **Personal Immersion**

With personal immersion, players literally put themselves into the game, i.e., their thoughts, appearance, emotional as well as behavioral responses to the story events, etc., all within a fictional context. This is also applicable to avatar characters, by the way, where the player character doesn't look like the player themselves but instead the character the player opts to identify with, and also makes up most of the appeal of the game. The significant feature is that the character retorts precisely how you feel like responding to any situation, even though the character might look like the player or be in a recognizable context (Leibovitz 2014). Rather than just sympathizing with or understanding the behavior of character, you determine it. Providing the player with an opportunity to select reactions to events makes the character's behavior and reactions more in line with the players themselves, and the more details the player feels like they're putting into the game, unlike the game putting into the character, the higher the sense of personal immersion. Personal immersion is perhaps the most comprehensive kind of immersion, and one that can just exist in games because of the requirement of player agency in completely dictating story events. Hence, it is obvious that why game developers care more about immersion than the players (Madigan 2015).

10.6   Reasons to Immerse Yourself with Games

- **Customization**

For utilizing customization, a game designer has manifold options that offer a setting for players leading to the highly immersive playing experiences. By putting more stress on player immersion, players can be engaged more with the games. Immersive experiences can make extremely personal as well emotional moments. The experience of immersion is quite therapeutic and may also help the players to deal with stress (Baek 2013).

Customization in immersion is formed from the previous and current interactions between the system and the players. Players are actively participating in the development of playing experiences, proposing their personal experiences, desires, and anticipations with them (Ermi and Mäyrä 2005). There are numerous factors that can impact player immersion and that cannot be controlled by the game designer. Surroundings or the present life situation of the player pose a significant influence on the playing experience as well as the degree of customization.

- **Interaction**

Interactivity is the major element that enhances customization as well as sets the games apart from the traditional media. Immersion can happen in movies or books without an interaction between the consumer and the media. Interactivity gives games and gamified products a unique prospect to engage the player in a

customized way and offer them a basis for provoking strong emotions and expe-
riences. Qin et al. (2009) explain that immersion is a growing attribute that is
resulted by the interaction between the customized game and the player.

- **Discovery**

A lot of games developed today are totally based on the concept of exploration,
with numerous gaining cult status among the community because of the excellent
exploration concept fixed in their engines. But usually, when we think around
exploration in games, we think geographically, as in, geographical exploration of
the game's map area. Though exploration might be varied across numerous cate-
gories and can even be broadly categorized in terms of discovery of things in a
game (de Byl 2015). This discovery of items or other things in the game results in
excitement and generally, a positive interest in the game. The kinds of discovery in
the game can be geographical, mechanical, content based, or narrative based.

- **Escapism**

Games are sometimes taken as being integrally escapist because of two key factors:

GAME AS ESCAPISM

- GAMES & PLAY
- SERIOUSNESS & WORK

- First, they are the outstanding proponents of cutting edge virtuality, exempli-
  fying the appealing unreality of something mistakenly conceived of existing on
  the other side of a screen.
- A second factor for connecting games with escapism is based on a common
  perception of games and play as opposite of the seriousness and work and
  someway set apart from the everyday, ordinary life (Ryan 2009).

Games are engaging and interactive and provide the obstacles to overcome. Maybe
gamers are now escaping into other worlds, but usually those worlds have more
challenges and problems than our own. Players are realizing a responsibility in that
very act of playing, freely taking it upon themselves to put down a distorted

apocalypse, escort a stranded child out of harm's way, or even just pile heaps of experience onto their avatar to hit that elusive next level (Teng 2010).

- **Emotions**

All emotion leads to a form of motivation (de Byl 2015). It can be tough to use emotions to inspire players because of the multidimensionality of the emotions. In fact, the exact impact of a game design on the player's emotions cannot be precisely predicted. Design choices can inspire a precise reaction or emotional response (Burns and Fairclough 2015). Using approaches to impact the emotions of players may surge the impressiveness of a game.

During a gameplay, the player passes through a lot of emotions. These emotions are not limited only to the instant of the play but can also happen before and after the play. Emotions are the responses to events, people, thoughts and things encountered (Atkins 2013). Manifold gameplay elements hold the potential to provoke emotion, yet outside factors can also impact the mental condition of the player. Narratives, storytelling, challenges, social factors, and player story are among those elements that can lead to an emotional response. All of such experienced emotions may not be very strong and hard to detect, but they still have effect on the playing experience.
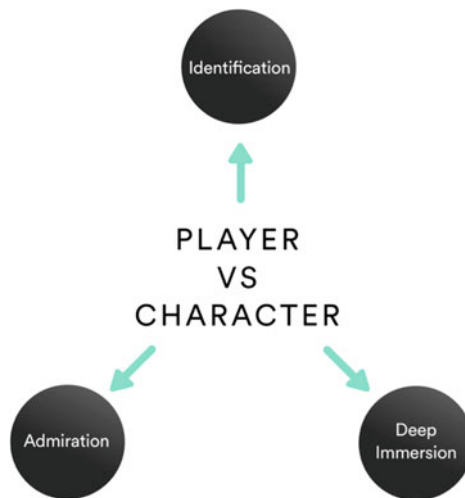
It has been found that players who empathized with the character found themselves internalizing the qualities of that character. This reveals two important things:

– Players can identify with the characters sufficiently powerful that a very deep immersion experience is possible.
– Players tend to look for the characters having the qualities they admire.

However, it implies that the reverse is also possible; players can be driven to insert their own prized qualities onto the tabula rasa of an open-ended character.

Even though intriguing the positive emotion within a player may be the objective for numerous games, but there is no reason why a game must just strive to produce positive emotions. A negative emotion may leave an ineradicable memory that is valued by the player. "Negative" emotions do not essentially mean a depraved playing experience. Generally, the rewarding events within games produce positive emotions; however, the negative events do not provoke only negative but also optimistic, feelings in the player (Madigan 2015). Games might elicit feelings in the player which, while generally perceived as negative, could be the wanted emotion at the given time. Some of these circumstances could include grief experienced through narratives, or horror led by the atmosphere in the game.

- **Effectiveness**

Games that lead to hard decisions with important consequences are the most effective. The emotions that games provoke can open up conversations in and outside the workplace (de Byl 2015).

There's not any special formula for making an effective immersive game. The key is to match the game elements with the impact objectives of the users who are using them. The game design and elements determine the game's rules, concepts, and impressiveness. A well-crafted game design is a great way of forming a solid base from which to begin making an immersive and effective experience. Preferably, the mechanics and rules of a game are combined in the player's mind and they can enjoy the gameplay moments without sharing their focus. Instead, the rule system establishes itself experientially in the form of decision-making and the search of personal and game-defined goals (Madigan 2015). Learning goals are a main component of ludic involvement, as they inspire the player to involve with the game, though they are not required in making an immersive playing experience. More significant is developing a good flow which engages the player across all the moments of play.

Anticipation, stakes, and decisions can also be used in games for more effectiveness and intensifying the emotions experienced. Decision-making is an essential component of any interactive game, though the games are characteristically attempting to control the player and push the decisions they make in a certain direction. As a matter of fact, the decisions, the player is even able to consider making, are clearly generated from the game design, mechanics, and rules (Ermi and Mäyrä 2005). Even if the game design may control and guide the player's decisions, it is vital to make an illusion where the player feels that their actions have effect on the consequence of the situation. If players apprehend that they have no control over the game outcome, they would stop playing at once.

- **Memorable Actions**

Things that lead to memorable actions in games are based on goals and rewards. Rewards are essentially and intrinsically linked to completing the game's goals. This creates an extrinsic motivator for the player to attain the game's goals. The

game can reward the player in numerous ways, like offering records of achievement, story content, or attributes to level up the player's character. Rewards that are parallel to the motivations of the player seem more valuable (Wissmath et al. 2009).

A player appreciating a story-oriented role-playing experience may want story content over gaining a score-based reward. An achievement-oriented player though may well favor be getting a high ranking among other players.

As mentioned earlier, not each game has a clear goal. These games are usually creative, with no set win condition. Players may set their own personal goals that would help the player feel a freedom over their personal experiences in the game. In games where there are no set objectives, the game's community would usually set their own goals for the players to try and attain. Due to this, there are numerous rewards for getting these goals developed into the game. The rewards, so, are all about a personal satisfaction. Goals can therefore be determined by the game system, defined by the individual player, or negotiated by a player's community.

10.7   Conclusion

Creating a game that is immersive requires conscious efforts from the game designers. Immersion engages the player, keeping them dedicated to the game, and later motivates them to return. The immersion in game design is mostly about creating physical experiences. Immersion in games is regularly discussed in ludology, the study of games. Various theories concerning player immersion have been presented, bringing different perspectives to the conversation. When defining immersion, it is essential to acknowledge that it is constructed from multiple aspects. Immersion is an experience, a combination of different elements, rather than a single event. For utilizing customization, a game designer has manifold options that offer a setting for players leading to the highly immersive playing experiences. Games are sometimes taken as being integrally escapist. Players are realizing a responsibility in that very act of playing, freely taking it upon themselves to put down a distorted apocalypse, escort a stranded child out of harm's way, or even just pile heaps of experience onto their avatar to hit that elusive next level. This discovery of items or other things in the game results in excitement, and generally a positive interest in the game. The kinds of discovery in the game can be geographical, mechanical, content based, or narrative based. Narratives, storytelling, challenges, social factors, and player story are among those elements that can lead to an emotional response. There's not a special formula for making an effective immersive game. The key is to match the game elements with the impact objectives of the users who are using them.

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Chapter 11
Immersive Virtualizations

Abstract Immersive gamified environments hold immense potential to deliver value to the learning process of the content in a training and development settings. However, it requires the adoption of new methodologies and approaches. The purpose of such virtual apps may differ greatly and thus training needs for immersive virtualizations in gamification experiences also differ. This chapter explains immersive virtualized experiences in the context of gamification, their role and functions in various learning settings, the technologies behind extended realities like augmented reality, mixed reality, and virtual reality as well as their interrelatedness.

Keywords Extended reality · Augmented reality · Mixed reality · Virtual reality · Reasons to care · Power of immersion · Entertaining environment · User experience · Implications · Immersive experience · Level of interaction · Content · Design choices · Ethics · Blended world · Learning and education · Wearable technology · Healthcare · Collaborative virtual reality · Internet of bodies

11.1 Introduction

The concept of continuous learning used to be progressive, but now it has become a necessity for most of us. Even the working professionals moonlight as students. This is one of the key reasons why educational technology is such a rapidly growing industry (Welsh 2014). Educational institutions are seeking the ways to invest in novel educational apps and learning technologies. And at present, there are two trends rising in the EdTech field; extended reality and gamification. These trends are seen in apps covering the entire range of subjects from geography to math to foreign languages, and even practical expertise like operating facility machines or direct cardiac message (Dunleavy 2014).

Virtual and augmented reality in the academic or educational applications have proven to bring a new kingdom of possibilities for developing engaging and enriched learning experiences. When it is about the educational apps, a virtual environment typically refers to a system that lets the designers develop simulations.

From sites to apps and beyond, new tools are changing the face of education today. The purpose of such virtual environment's apps may differ greatly, for instance, the factory workers might require determining how to run complex machinery at their assembly line, pilots might need virtual training before being entrusted with the real planes, and employees learn how to familiarize themselves with a new building.

Right now, there are numerous businesses competing to deliver their own version of virtual experiences in a gamified setting. Now, gamification is broadly applied being a part of the strategy for promoting educational activities as well as healthy lifestyles by making the monotonous or even stressful tasks such as studying and exercising with meaning feedback loops that promote engagement.

11.2   Extended Reality

Think of reality as a path, starting with analog real life and ending with fully digital representations. The first step on that path is "augmented reality" (AR), overlaying digital information and elements on top of the live, real world. About halfway down the path is "mixed reality" (MR), in which digital objects are embedded into the real world as though they were a part of it. At the very end of the path is "virtual reality" (VR), in which the real world is shut out and you're inside a fully digital environment.

All of these increasingly huddle together under the umbrella term of "extended reality" (XR), covering all steps along the "virtuality continuum."

Extended Reality (XR) offers this promise of an improved interface by making technology ready to hand. XR is an umbrella term that encompasses both augmented reality (AR) and virtual reality (VR), although experts agree there's some inconsistency in the way these terms are used. AR and VR are the two points on the spectrum of what we call "immersive computing."

We are living in such a world where the technology touches almost each aspect of our lives, and with novel developments in technology taking place at an exponential rate, it's only natural for us to apply this newer technology to appraise the way we do things and communicate with one another. The development of a technology has had businesses racing since conception to maximize its potential in a way that is recognized by consumers: extended reality is a striking technology due to its practical uses and latent to change multiple industries (Wilson 2015).

11.3   Augmented Reality

Augmented reality brings graphics, haptic feedback, sounds, and smell to the natural world as it exists. Both cell phones and video games are driving the augmented reality development. Everyone from soldiers to tourists to someone seeking for the closest subway stop can now be benefitted from the possibility to put computer-generated graphics in their field of vision.

The blended use of augmented reality (AR) and gamification in numerous fields is presently gaining much popularity for its ability in engaging users. Meanwhile, the AR is a technology that overlaps the computer graphics onto the real environment. However, as a newly developing concept, gamification bears some arguments about its elements, concepts, and efficiency in a similar intervention. Nevertheless, preceding adaptation of games in AR shows that there are also potentials to use gamification concepts, as well as AR and AR games in brief.

The ability of augmented reality to enhance computer-generated information into the real world and work in real-time interaction is highly appealing to the researchers in the gamification, game field, and industries. Since its advent, there are several augmented reality games that have been established and tested by researchers along with the augmented reality games that were developed commercially. Augmented reality gaming (AR gaming) is the integration of game visual and audio content with the user's environment in real time. Unlike virtual reality gaming, which often requires a separate room or confined area to create an immersive environment, augmented reality gaming uses the existing environment and creates a playing field within it. While virtual reality games require specialized VR headsets, only some augmented reality systems use them. AR games are typically played on devices like smartphones, tablets, and portable gaming systems. An augmented reality game often superimposes a pre-created environment on top of a user's actual environment. The game itself can be as simple as a game of virtual checkers played on a table surface. More advanced AR games may actually build an environment from user surroundings. Such a game could involve, for example, in-game characters climbing from coffee tables to sofas on virtual bridges. Environment creation is a time-consuming task in game making and there is a constant demand for new scenery because once a user has explored an environment fully, they want to move on to a different one. AR gaming expands the playing field, taking advantage of the diversity of the real-world environment to keep the games interesting.

Augmented reality games for entertainment are exclusively developed for giving fun to the game player and serious augmented reality games are made for serious matters like for education, military training, and the engineering field.

Broll et al. (2008) proposed two kinds of current or next-generation mobile augmented reality games that are small and modest games and event-based or complex augmented reality games. Small and modest augmented reality games classically utilize standard technology apparatus like ultra-mobile personal computers or smartphones. On the other hand, the event-based mobile augmented reality application blends numerous apparatus like Head-Mounted Device (HMD), computers, and others in which it needs an extensive range of software and combination to run the mobile augmented reality games.

By and large, augmented reality games are in two different modes; indoor and outdoor modes (Carmigniani et al. 2011). Indoor augmented reality does not utilize GPS tracking to locate the location for augmented reality and the outdoor augmented reality usually uses the technology and often needs additional hardware for a complex augmented reality system. The games have been developed for

numerous purposes and it seems that augmented reality has gained an undistinguished attraction in the learning field.

However, out of the studies, only Eleftheria et al. (2013) and Schroeter et al. (2014) explained the gamification concept applied in the augmented reality game system. Although other studies also used the concept of game like quest (Bressler and Bodzin 2013), points and levels (Ho et al. 2012), and rewards (Holden 2014) there is not enough explanation found for gamification concept or other game element explanation to obviously show the game elements used in studies. At the same time, a diversity of multimedia elements has been used as the augmented reality content.

11.4   Mixed Reality

The significance of Mixed Reality (MR) games stimulates interest among education specialists and researchers who, since their current proliferation, have been trying to present their inspiring potential in learning contexts. Mixed Reality (MR) gamification support and motivate future learning and teaching, to address a broad range and difference of educational contexts. To achieve the above, a reliable computational framework that supports the new kinds of mixed reality and serious games have been established by the researchers that features MR-gesture-based and game-based learning (Kateros et al. 2015).

The nascent term Mixed Reality Serious Games (MRSGs) implies the digital mini game shells that let the teachers and learners to sense the "Presence" experienced under a new MR educational learning framework, in both Virtual Reality (VR) and Augmented Reality (AR) formal and informal learning. The former (VR) leads to the unique feeling of "being there" and "doing there" in the virtual world, that will be renovating the overall game-based learning experience, via newest innovations and current progress in Head-Mounted Displays (HMDs). The latter (AR) combines the real and virtual elements so that the 3D virtual component is registered precisely in the real world and interrelated freely by the learner via numerous mobile displays, including natural, gesture-based interaction, smart glasses, MR virtual characters as well as gamified learning processes.

Game-based learning as we know is based on integrating the games into lessons. The principal goal of applying games in the education is to upsurge students' engagement and motivation. Mixed Reality (MR) is an interesting field, speaking of the educational games. The user can like interactive virtual environments, and delight rises when the experience of audiovisual simulation is really strong. On one hand, for instance, one of the game's designs is taken as one of the most well-organized appliances for mobile VR experiences. The mixture of a handy portable device and its design offers an inexpensive, user-friendly VR interaction. In education, the used device has to be as simple as possible, since the key center of attention should be the application itself (Zikas et al. 2016).

On the other hand, the latest Augmented Reality (AR) advances, like those supported by gesture-based interaction (Billinghurst 2015), make a new gaming platform that is ideal for the desktop-based holographic applications. Wearing AR see-through glasses can make a unique AR gaming experience. Such kind of holographic headset having gesture recognition is researched to endorse improved interaction with the augmented content leading to a more integrated experience. This technology bears the potential to attract the students' interest and educate them via novel AR gaming. Thus, researchers' one of the main novelties is the creation of MRSGs having similar educational content for both VR and AR technologies to enhance their precisely adapted gamification elements, the learning experience, and also the gameplay in general. The gamification and gaming elements principles should be as close as possible for the application to have exact results. By comparing the gesture-based and game-based learning approaches in two diverse platforms and realities, you can extract the gamification elements that should be modified or remain complete through these novel MRSGs.

11.5   Virtual Reality

A realistic three-dimensional image or artificial environment that is created with a mixture of interactive hardware and software and presented to the user in such a way that any doubts are suspended, and it is accepted as a real environment in which it is interacted with in a seemingly real or physical way. Virtual reality (also called virtual realities or VR) is best understood by first defining what it aims to achieve—total immersion.

Total immersion means that the sensory experience feels so real that we forget it is a virtual–artificial environment and begin to interact with it as we would naturally in the real world. In a virtual reality environment, a completely synthetic world may or may not mimic the properties of a real-world environment. This means that the virtual reality environment may simulate an everyday setting (e.g., walking around the streets of London), or may exceed the bounds of physical reality by creating a world in which the physical laws governing gravity, time, and material properties no longer hold (e.g., shooting space aliens on a foreign gravity-less planet).

11.6   A Huge Potential

Virtual and augmented reality devices have enormous potential in almost every industry. The learners or players enjoy a fully immersive experience of a video game, a movie, or—as training and development professionals have been fast to recognize—a training simulation (Foni et al. 2010).

11.7   Reasons to Care About These New Applications

There are several reasons why virtual-driven applications are rising in popularity.
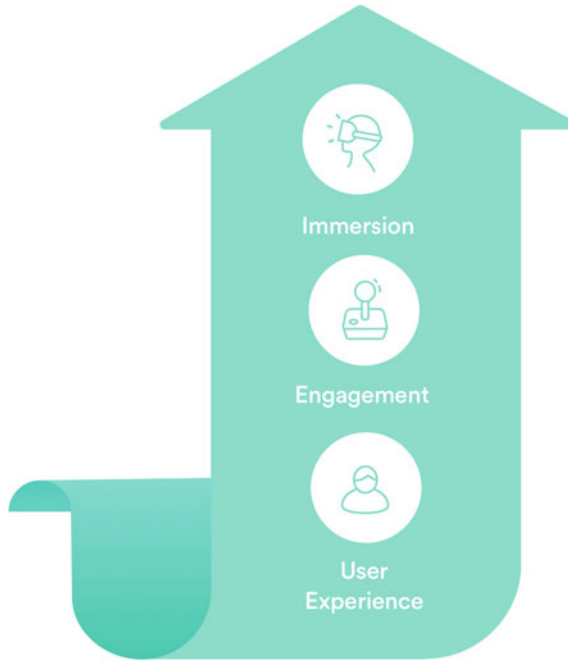
- **The power of immersion**

One of the greatest advantages for virtual world fans is the ability to take users right to the heart of the storyline. Advanced tech-enabled gadgets and software solutions can immensely enhance user engagement with multiple interactive activities. Digitally extended reality provides users with enticing virtual objects and makes them treat these objects as if they are real.

- **More engaging environment**

New technologies can grant much more fun to players compared to humdrum no-frills games. Cutting-edge capabilities enrich experiences, enabling a far larger scope of engaging options.

- **Improved user experience**

The future of applications is predetermined as users' needs and wants are constantly evolving, and thus designers have to cater to their high expectations. Given this, extended reality solutions seem to be a note-perfect option for gaining much

attraction and retention among the global audience. New designs look more appealing both to avid players and occasional users, making them spend more time and effort on virtual-fueled applications.

11.8 Implications Using Immersive Virtualizations

For users, virtual experiences literally expand the edges of the world and give new options in a three-dimensional environment. VR experiences also introduce the following:

- **New level of interaction**

The release of controllers made the crucial turn for interaction with virtual world surroundings. Now players can control and modify the virtual environment at their own will. Also, soon ultimate VR experiences are going to be achieved through all human senses.

This may accelerate as three promising implications are integrated into digital reality systems:
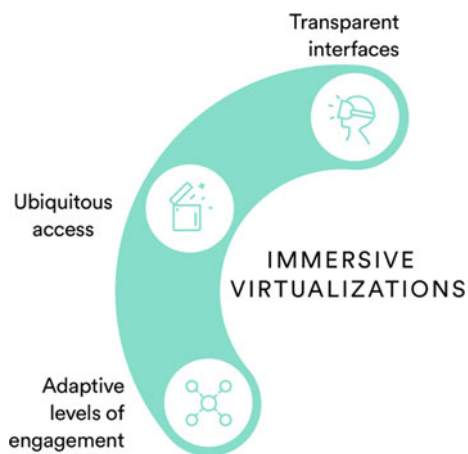
Transparent interfaces: A blend of voice, body, and object positioning capabilities will make it possible for users to interact with data, software applications, and their surrounding environments. Though such functionality will develop further in the coming years, it can already make interfaces seem much more natural.

Ubiquitous access: Much like we enjoy with mobile devices today, in the near future AR/VR will likely provide an "always on" connection to the Internet or to enterprise networks. But unlike having to reach into our pockets for our phones, we may soon wear AR/VR gear for hours at a stretch. Advances in design and the underlying technology are giving rise to a new generation of comfortable, self-contained digital devices free of tethering wires or bulky battery packs.

Adaptive levels of engagement: You are attending a virtual meeting with colleagues and a loud 3D advertisement launches in your field of vision, disrupting your concentration and interrupting the meeting. For the same practical reasons that we must be able to mute the ringers on our smartphones and block pop-ups when surfing the Internet with AR/VR having the ability to control data feeds appearing in our virtual environments will be crucial. In the near future, contextual "traffic cop" capabilities may be able to tailor data feeds to user preferences, location, or activities.

- **Playing experiences**

Immersion is created from interactions between the player and the system. Players are actively taking part in construction of playing experiences, bringing their personal experiences, anticipations, and desires with them (Ermi and Mäyrä 2005, p. 91). There are many aspects that can affect player immersion which cannot be controlled by the game designer. Surroundings or the current life situation of the player can have a significant impact on the playing experience. These external aspects can lessen immersion or intensify it to an extreme.

11.9   How Does the Use of Gamification Impacts the Ethics in These Applications?

Gamification is denoting the use of rewards, achievements, and other design elements that mimic the appeal of game experiences to our competitive impulses.

Criticisms of gamification have been gaining steam as companies discover that psyching up the workforce takes more than a round of quiz. Indeed, both critics and supporters alike believe that an effective gamified application requires expert design. It is not a simple matter of rewarding employees with badges and points that will magically turn them into power producers; an effective application must be immersive, engaging, and supported by employees.

11.10   A Blended World (Examples)

Learning & Education   Wearable Technology   Healthcare   Collaborative VR

- **Learning and education**

Learners and instructors are often thinking of novel ways to keep a simply distracted mind highly engaged with the course material or tasks. The gamification in learning is extensively valued in the education world, as it presents novel and interesting ways to engage the students and promote learning. Through gamification, a humdrum geology class can be turned into a series of achievements and digital unlockable instead of just tests and grading.

One concern of the gamification is that learners might be engaged for a while; however, become disinterested once the gamified application is mandatory—making it feels like more of a routine instead. Implementing the augmented reality into gamification leads to the layers of engagement and much interaction into learning, which can avert students from becoming disengaged (Marie-Laure 2004).

Imagine the geology class mentioned above. With augmented reality and gamification, it is quite possible to take the students on a scavenger hunt field trip, where they can walk to augmented markers, utilize their phone camera, and observe the diverse classifications of rocks. The field trip can become even more engaging with various kinds of achievements coupled with details about the rocks—turning a dull concept for young students into an interactive learning experience.

- **Wearable technology**

Extended Reality (XR) is resulting in the ways where we can immerse ourselves into another world. The way it does this is by placing a computer-generated setting over our eyes, needed us to wear headset leaving us in total immersion of a virtual world and blind to our real world. In several instances, it can combine the real world with the visual and audio aids using the computer-generated images to augment our smartphones and tablets, and also the world around us.

To completely immerse ourselves in virtualization, we'll still have to wear something like the extended reality headsets, but more along the lines of glasses as to keep a complete field of view with the real world that we just can't get with a mobile phone or tablet screen. Wearable technology can, and most likely will, overlap with smart apparel.

- **Health care**

If you recognize and acknowledge the way how extended reality can change education, then you can perhaps effortlessly translate that to our healthcare industry. Similar to teaching students, the extended reality will allow for the surgical procedures' instructions. Probably more appreciated, it lets the instruction of surgical procedures not to be conducted on patients, but as a simulated training session in practices like ophthalmology as added educational and procedural efforts.

For instance, extended reality could better make a potential ophthalmologist for eye surgery. It would help hugely if they could see where the astigmatisms and veins are located on a patient's eyeball and compute the potential injury of an incision before they determine the hard way. It could also help during the surgery, helping a surgeon in real time. Medical students can even study the inner workings of the human body parts, in depth, they choose to specialize in.

- **Collaborative virtual reality**

A collaborative virtual setting is a space in which numerous people interact with each other, often on several locations. The goal is for these people to share their ideas and experiences in the co-operative setting—hence the name. The collaborative virtual reality is the computer-generated world with which user can interact in a virtual environment often described as socialVR.

As virtual reality is getting affordable and portable with time, the collaborative virtual reality has the biggest potential to be as common as a screen share meeting. Together or in discrete parts of the world, collaborative VR gamified experiences, for instance, allow gamification designers to review the models in virtual reality. Most of the collaborative VR tools include built-in voice, a designated lead presenter, synchronized cloud models, collaborative markups, and scale and mute control.

One potentially successful strategy is concerned with the use of Collaborative Virtual Worlds (CVWs). In recent years, the immersive 3D CVWs (where each user is represented by some avatar that they can control to steer and deploy the 3D environment) are being used to simplify learning in innovative ways, including for language and cultural learning through cross-cultural collaboration (Berns et al. 2013; Shih and Yang 2008; Ligorio and van Veen 2006). CVWs may deliver features that lead to more actual learning environments, like flexibility, collaboration, interactivity, and optimal feedback (Reisoğlu et al. 2017). Increased collaboration might be facilitated in virtue of the fact that CVWs are classically delivered via the Internet, and CVWs are used for distance education also (Schoonheim et al. 2014; Wang and Lockee 2010).

11.11   Moving Closer to Our Bodies

Virtual reality and its experimental tech contemporaries are exploring new ways to incorporate the body as more than just an anchor to the physical world. There is a connection in a virtual reality and the "internet of bodies," the hope for the future is in recognizing and augmenting physical bodies in games and play. Technologies like programmable gels will be used with the body in more intimate ways, such as rubbing "gels on to erogenous zones," allowing partners to "connect together at a distance."

11.12   Conclusion

Extended reality in the academic or educational applications has proven to bring a new kingdom of possibilities for developing engaging and enriched learning experiences. When it is about the educational apps, a virtual environment typically

refers a system that lets the software developers develop simulations. There are incredible opportunities in the near future for training that combines gamification with cutting-edge virtual and augmented reality technology. As always, the goals of any training are improving engagement and effectiveness, and these tools with their competitive appeal and innovative realism will help us take training to a whole new level. The blended use of Augmented Reality (AR) and gamification in numerous fields is presently gaining much popularity for its ability in engaging users. The Mixed Reality (MR) gamification supports and motivates future learning and teaching, to address a broad range and difference of educational contexts. As virtual reality is getting affordable and portable with time, the collaborative VR has the biggest potential to be as common as a screen share meeting. Together or in discrete parts of the world, collaborative VR gamified experiences, for instance, will allow gamification designers to review the models in virtual reality. Like any technology revolution, Extended Reality (XR) brings opportunities and risks. One thing is certain: the boundaries between what we know physically and virtual reality will disappear one day. It will no longer be "either/or"; we will transition seamlessly between the real world and the computer-generated world.

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Chapter 12
Multimodality and Gamification

Abstract The term multimodality refers to a particular mode wherein something is expressed or experienced. In the context of gamification, it implies the diverse dimensions the gamification is used for across various domains and technology sectors. Classic gamification used on the consumer end has often been connected to reward-based models while the modality in gamification in modern times is related to even more diverse, more comprehensive, and perhaps more complicated experiences. This chapter reveals those areas including haptics, augmented reality, mixed reality, virtual reality, sensors, and other relevant concepts and technologies.

Keywords Multimodal interfaces · Multimodal interactions · Haptics · Virtual reality environments · Social semiotics

12.1 Introduction

Today, the gamification has been evolved to include event and goal tracking, sales acceleration, and knowledge training that is directly linked with core gamification uses and is cross functional. All of the traditional and benefits are under single umbrella. With such advancements, we get a concept of multimodality in gamification and along with that the new opportunities that are arising for the businesses to use gamification to impact their internal organizational structure and bottom line.

User experience design in games is different from other UX designs as it involves an added element—fiction. The fiction is based on an avatar of the actual user or player. The player is invisible, but main element to the story, much like a narrator in a novel or film. Diegetic user interface elements are present in the game world (fiction and geometry) so the avatar and player can interrelate with them through audible, visual, or haptic means. Well-executed diegetic UI elements improve the narrative experience for players, offering a great immersive and integrated experience (Collins 2008).

12.2   Multimodal Interfaces

As discussed, virtual environments are applications that have the great potential to increase people engagement in a participatory and collaborative way. Users interact with interfaces under various situations, where the content, the form, and the modalities will be manipulated to fit the user's behaviors. Nowadays, gamified applications are involved in a child's education as tools for learning or practicing some academic skills. However, most educational apps are designed without any considerations about children with motor system difficulties. Thus, the main benefit of multimodal interfaces is to allow for inclusive design, which will enable children with motor disabilities to use the same application other children use. Since focus and concentration are major skills for children in the learning process, many physical applications can be performed with assist from parents or teachers to practice these skills. The effectiveness and the use of multimodal applications as computer-based exercises are ensured by implementing a multimodal system that offers an inclusive design for interactive apps to practice the skill to focus. Multimodal app's interface is designed to provide the advantages of both current physical games and computer exercises and make these exercises available for children with wide range of abilities.

12.3   Multimodal Interaction

Multimodal interaction provides the user with multiple modes of interaction with a system. A multimodal interface provides several distinct tools for input and output of data.
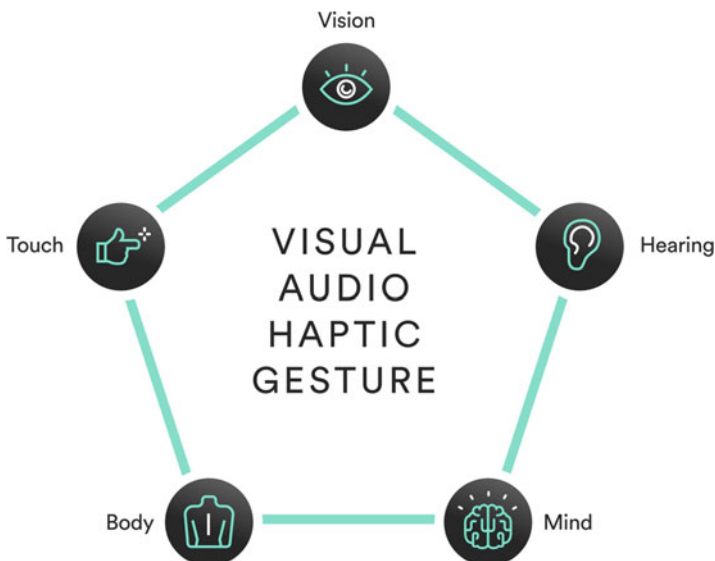
For example, a multimodal question answering system employs multiple modalities (such as text and photo) at both question (input) and answer (output) levels. It is important for user interaction modalities to reinforce the story world and bring it into the real world to ensure a successful role play and establishment of social believability. The user interface is designed to be physical and tangible so that discrepancy between action and perception can be reduced. Interaction is supported through large and micro-screens, physical interfaces and multimodal interaction devices. Full body interaction and movement in the physical space, particularly important in social behavior and culturally specific interaction are supported.

12.4 Haptics

The word haptics has been derived from the Greek word "Haptikos". It refers to the sensory "feedback"—the feel we get upon feeling or touching something. In the early 1900s, the psychologists conducted a lot of research for the active touch of the real objects by people and whatever they perceived from this. In digital world today, the science has evolved to how humans relate with computers as well as devices via touch. Haptic technology is hence nothing new. In fact, it's now in everyday use, most especially on devices. It's also used in some trainings in various settings.

The use of gamification could help to accelerate the experimentation effort primarily given by the virtual simulator options. Their key objective is to guide and motivate the trainee into the accurate steps for the procedures, by delivering feedback via awards, in the form of the points, achievements (through the use of badges), and overall performance or status comparison (with the leader boards element) (Hakulinen et al. 2013).

For example, Rodrigues et al. (2014) propose that the integration of gamification in haptic systems lets the user to augment the level of realism and to attain an enhanced level of involvement. Deng et al. (2016) concluded that haptics present one more aspect of sensory modality for a more immersive experience. In the same way, Hou et al. (2014) highlighted that haptics might be used to bring an immersive and accurate virtual environment.

Beyond the undeniable advantages stated, noting that one of the key advantages of a haptics experience is in its ability to surpass the limits of the real world, we claim that haptics can be pertinent for the rendering of information that is not signified (or is under embodied) in the real world.

Haptics are not encompassed at the core of the gamified process; one talks about mixing the haptic into the game design. In this view, the haptic interaction is viewed as being a third party that would be included afterward into the gamification experience. For example, Rodrigues et al. (2014) noticed that there is a vital question about to how "to add haptic devices" to adapt their limitations to a precise problem addressed in a gamified setting. They also showed that the incorporation of

the device must also be realized without conceding the content of the application. However, considering the distinctiveness of the haptic modality (being bidirectional), we cannot separate haptics from the content nor from the interface with the gamification. On the contrary, it is argued that haptic interactions should be central to the gamification design process.

Considering such observations, it seems that while numerous people can see haptics as being valuable to promote the immersion and the realism of a gamified experience as well as game, it is not clear that several users think that haptics might promote learning outcomes in the similar settings.

12.5   Virtual Environments and Haptics

In contrast to physical devices, using virtual environment approaches to design assistive technology can be completely or partially virtual based. Partially virtual is seen as an augmented reality where the user has to interact with physical objects, in order to progress in the virtual environment. Unlike physical devices, VR can receive input ranging from standard keyboard and mouse, body tracking, to interacting and manipulating other objects. Although haptic is a popular feedback mechanism, a VR approach uses a combination of haptic and audio feedback to provide an immersive experience.

Virtual Reality/Environment (VR/VE) has the ability to take advantage of its benefits such as learning transfer, obtaining precise data, and to rapidly simulate ATs and task environments. Virtual reality may be vastly different from the real world, not only its interaction but also the digital content. Thus, users' experiences are different, which affects whether a specific skill is learned and transferred to the real world. These gaps are narrowed by having a realistic and authentic simulation of the real world. Simulations that are based on physical specifications (e.g., range-sensing sensor's profile). Furthermore, with intuitive and natural interaction (i.e., gesture), the learned skills are more aligned with the real world.

Since its advent, augmented reality technology gets much attractions in the research world and now the technology flourishes to be applied for marketing as well as in different kinds of learning systems (Holden 2014). The capability of the present technology enables the users to use AR in a very affordable way, for instance, by using their smartphones. At the same time, the AR game has also appeared in view of AR can promise presence, interactivity, and experience for engaging the people (Iwata et al. 2011). Since then researchers as well as academics try to develop AR apps in imaginative ways to engage the users. In the learning field, the AR game can result in escalation of motivation and a well-designed AR gamified experience can also provide positive impacts on the cognitive process (Ferrer et al. 2013).

12.6   Could Gamification Impact the Multimodality?

A multimodal social semiotic approach focuses on meaning making, in all modes. It is a theoretical perspective that brings all socially organized resources that people use to make meaning into one descriptive and analytical domain. These resources include modes such as image, writing, gesture, gaze, speech, and posture; and media such as screens, dimensional forms of various kinds, books, notes, and notebooks.
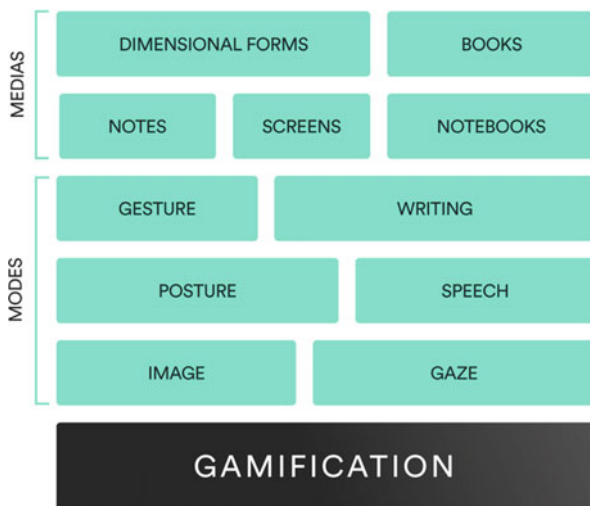
All of these modes and media are also used in environments designed for learning. That makes a multimodal social semiotic approach particularly apt for studying learning.

The application of gamification in a pedagogical context provides some remedy for many learners who find themselves alienated by traditional methods of instruction. The use of gamification could provide a partial solution to the decline in learners' motivation and engagement many systems are facing today.

- How do new interfaces/interaction devices using the body as input device influence the user's experience and gamification design?

12.7   Conclusion

Gamification techniques are now being used on a frequent basis to solve traditional pain points and deeper internal processes at businesses of all sizes. Beyond the undeniable advantages stated, one of the key advantages of a haptics gamification

experience is in its ability to surpass the limits of the real world. Considering such observations, it seems that while numerous people can see haptics as being valuable to promote the immersion and the engagement of a gamification experience. It would greatly accelerate the speed the gamification objectives are to achieve with while enriching the learning experience to an incredible extent. The blended use of Extended Reality (XR) and gamification in numerous fields is presently gaining much popularity for its ability to engage users. The significance of such gamified experience is likely to stimulate interest among education specialists and researchers who, since their current proliferation, have been trying to present their inspiring potential in learning contexts.

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