Examining the Relationship between User Interface Preference and Screen Addiction in Video Games

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Abstract

This study investigated the connection between screen addiction and user interface among tertiary students at the University Teknologi MARA Kedah Branch in Malaysia (N=579). The two main elements of video game analysis have been the user interface and screen addiction. According to the investigation results, playing video games has been linked to mental health issues. It has been suggested to be the cause of the current rise in time spent using screen-based technology. The conclusion emphasised the need for devices with a screen addiction-based user interface preference.

Keywords: video game; user interface; screen addiction;

DOI: https://doi.org/10.21834/aje-bs.v8i24.421

1.0 Introduction

The term "digital technology" refers to the various digital devices, systems, and resources that can help create, store, and manage data. The usage of digital technology has been widely adopted and appropriate to the needs of the millennium generation, which enriches and supports a variety of fields or users. These shifts reflect how technology is becoming an increasingly important component of education 4.0. Through education collaboration, digital technologies are spreading to encompass more than just new and less traditional teaching and learning methods (Qureshi et al., 2021). Technology has moved to various platforms, including mobile devices, computers, virtual worlds, the internet, smartphones, video games, and others. Smartphones have become a representation of our increasingly technological civilization. Because of their numerous capabilities, such as access to the internet and various multimedia platforms, smartphones have quickly become an indispensable component of the way of life(Sandeep, 2018).

The study of how humans interact with computers, particularly as it applies to the creation of technology, is known as human-computer interaction, or HCI. In order to create technologies and products that are easy to use, human-computer interaction (HCI) is often paired with user-centred design, user interface, and user experience. Engagement is a concept that is of the utmost importance in human-computer interaction. Not only does it help to inform the design and implementation of interfaces, but it also enables more sophisticated interfaces that can respond to users(Oertel et al., 2020).From the user's point of view, the user interface of an information system is one of the most essential components. The graphical and typically touch-sensitive display on a mobile device, such as a smartphone or tablet, enables the user to interact with the device's apps, features, content, and functionalities are referred to as a mobile user interface (mobile UI)(Umar et al., 2020). There may be aspects related to consumer interaction that play a role in developing video game addiction (Abbasi et al., 2021). Repeatedly failing to exercise control over one's behaviour and continuing to engage in the behaviour despite its negative repercussions are two of the primary indicators that one may be addicted to a substance or behaviour. Addiction can be defined as a pathological behaviour that provides relief from uncomfortable feelings. When an individual's propensity for addiction, often known as their "addictivity," is combined with the addictive potential of a substance or pathological behaviour, the result is the addictive process (Adès, 2020).

This paper aims to offer an overview of the current condition of the user interface and address the most essential issues of screen addiction that have been highlighted in the previous paragraphs. The following section will familiarise you with basic definitions and terminology for video games, user interfaces, and screen addiction. Thereafter, there will be a discussion of the research methodologies used. After that, a condensed version of the research findings is presented. The final sections give some recommendations for how its development might be maintained in the future.

2.0 Literature Review

Today's digital technologies are incorporated into every single private and public organisation. These technologies include social media, business analytics, the Internet of Things, big data, advanced manufacturing, 3D printing, cloud and cyber-solutions, and massive open online courses (MOOCs). As a direct result of the expansion of digital technology, enormous shifts are taking place in many aspects of society, including education, professional competencies, gamification and job prospects(Rippa & Secundo, 2019). The game is always present in a people's life and is necessary for the individual and society. This is primarily due to the social ties achieved by those participating in the game. The availability of digital technologies, such as the Internet, computer games, smart phones, and social media, has substantially increased over the past two decades. This trend has been mirrored by a growth in their use(Sussman et al., 2018).The evolution of technology and the spread of the internet have made it possible for a new genre of game to come into existence.

Video games directly influence how people who use the internet choose to spend their leisure time and are rapidly displacing more traditional forms of entertainment(Baltezarević et al., 2018). Video games, which have traditionally been thought of as products related to entertainment, are currently one of the areas of digital technology experiencing the most rapid expansion. In the early days of video games, people worldwide engaged in actual gameplay because they had access to digital technology and the internet. People can now play video games more regularly and on a scale that spans the globe due to the proliferation of the internet, which has made it much simpler for them to do so(Shawalludin et al., 2022).The video game industry has become a key player in both the commercial and entertainment industries. Since they are now so prevalent and broad, video games are now considered a component of the mass media, a common technique of storytelling and representation. Until recently, relatively little emphasis was paid to studying how playing video games influences how individuals think and interact across cultures. Even though video games are prevalent, their diversity is expanding, and their player population is diverse(Shliakhovchuk & García, 2020). Video games are not only entertaining but also instructive. Survey respondents reported that they improved their knowledge of subjects such as the English language, the fundamentals of informatics, strategic thinking, geography and history, collaborative problem solving, cultural knowledge, perspective-shifting, and creative problem solving while playing video games(Shliakhovchuk et al., 2021).The story of the game uses the game's interface and system settings, while at the same time, those settings are used to propose a look at what it would be like to have a posthuman experience. The bugs, errors and other issues with the technology help naturalise a mediated interface. This enables the player to have a more immersive experience with the narrative(Kozyra, 2020). Teenagers should be encouraged to engage in physical activity, according to arents, especially for their mental wellbeing. The majority of parents thought their kids weren't moving about enough. Due to the violent nature and potential for addiction, parents indicated that their children played video games frequently(McMichael et al., 2020).

A successful user-centered gaming interface is vital to the gaming business and significantly contributes to human–computer interaction practise(Ng et al., 2012; Y. Wu & Bryan-Kinns, 2019). The design and application of computer technology focuses on the interfaces between humans and computers is referred to as human–computer interaction (HCI) research. Applying the structure and particular method of human-computer interaction to thoroughly understand and determine whether users can correctly and rapidly recognise products has a favourable effect on the work being done on the visual and perceptual interface design (Z. Wu & Jin, 2021). A solid understanding of the requirements of individuals who will be using the interface regularly, as well as how they interact with it, is essential to the design of an interactive user interface. The user interface can reduce the amount of time spent searching for information, raise his level of pleasure, and meet his requirements in a quick and effective manner thanks to an interface that is simple and straightforward. It is agreed upon that the user experience and interface are both crucial components of the creative industry and play an important role in the sector. Nonetheless, some design practitioners still have a hazy understanding of the user experience and the applications that include the user interface(Abdul Kadir et al., 2020). Supported by the statement by Ummirah et al., (2022) from designing an interface, it is a good idea to begin by gathering information about what the users want to do.

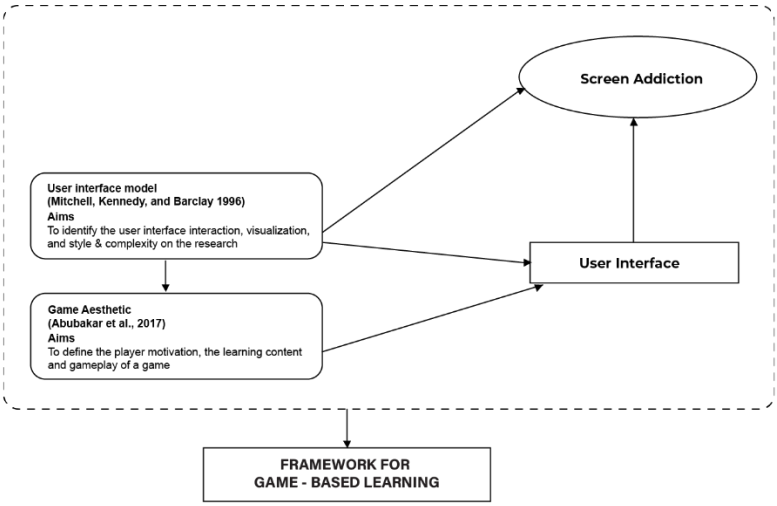

Figure 1: Theoretical Framework

Screen addiction is a genuine issue, and excessive use can lead to health hazards. Screen time should be limited to prevent addiction. The amount of time spent on the electronic gadgets has a direct and measurable impact on our physical, mental, and

emotional health and the ability to get quality sleep. Problems with screen addiction can cause individuals to change their behaviour even when they are unaware of the changes they have made(Nor Fazilah Noor Din, 2019). These negative impacts can manifest in a variety of ways. Yet, the focus of this study is actually a response to the addiction problem, which inspired and reacted to the potential of future investigations and preference for video game use, especially on the user interface.

The research framework is illustrated in Figure 1, which shows how the research interests can be guided and how the query can be used to address the topics. The effect of designing a good design is that it enables designers to provide a better user experience by customising the user interface to the characteristics of each unique user (Alves et al., 2020). A model that characterised the primary components of the user interface was suggested. These components include user interface interaction, visualisation, and style and complexity. In characterising user interfaces, according to the classification style and complexity it depends on, user interface interaction and visualisation are key components (Mitchell et al.,1996). Using this approach will make the research more valuable in applying the user interface research for game-based learning when encountering screen addiction. Regarding to game based learning, its more relevant in psychological and behavioural than they are practical, these are the kinds of skills that should be developed starting in elementary school. Learning through play, game-based learning, and gamification are practical approaches to developing competencies skills(Liu et al., 2020). The implementation of game-based learning can provide educators with pedagogical advantages that can augment the education they provide in the experimental conquest of emergency online teaching that is taking place amid the global public health crisis. Learning through play of games is an efficient method for improving students' motivation and overall learning outcomes.

3.0 Method

3.1 Participants

The participants came from various undergraduate programmes offered at the Universiti Teknologi MARA and were chosen randomly. They were given a survey through Google Forms and evaluated demography, video games, game interfaces, and game-based learning. The respondents provided their responses to a total of 35 questions. A total of 579 students responded to the questionnaire, with female students providing a response rate of 69.9%, followed by male students providing a response rate of 30.1%. Most of the 229 responders are young adults, with an average age of 20. The questionnaire was designed to include screening test questions for screen addiction and user interface preference, and respondents were instructed to answer the questions appropriately. The questionnaire aims to collect information about the; respondent demographics and their attitudes regarding video games and user interfaces in terms of preference. The rates reported are weighted using inverse probability weights.

3.2 Procedure

The research was carried out at the Kedah Branch of the University Teknologi MARA and focused on the subject of user motivation as well as user interface preferences. The questionnaire was sent out to all of the participants via email and WhatsApp. It was made clear to the participants that their responses would be kept strictly confidential and that any information collected about them would be kept in securely.

3.3 Instruments

Undergraduate students were polled using a Google Form, and the results were communicated to their respective lecturers via WhatsApp. Questions regarding the respondents' gender, age, undergraduate or faculty status, and current semester were among the general demographic background inquiries. The questionnaire is divided into four sections, including demographic background, video games, game interface, and game-based learning. A few questions include Likert scales with five points each (1 is a strong disagreement, and 5 is a strong agreement).

4.0 Results

The study was entitled " Examining the Relationship Between User Interface Preference and Screen Addiction in Video Games," and it was carried out with the assistance of an online questionnaire, with 579 participants coming from a variety of undergraduate courses and being programmed. The overall perceptions of those who participated in this research show that the respondents consider video games to be their favourite user interface for a variety of experiences. When it came to the study's findings, user experience and preference were both important aspects; however, video games allowed researchers to look further than those considerations.

4.1 Population of Students

An initial investigation was carried out in an attempt to determine the video game and the device used to play it. The preliminary research included participation from 579 undergraduate students aged 18 to 24 years old. According to research carried out by R. Hirschmann, (2021), the majority of Malaysians who play online video games are between the ages of 16 and 24, and the vast majority of them play the video game daily. The experimental group, which participated in the mobile game during the intervention period, the previous experience served as a reference for the preparation that was done ahead of time. After going through and analysing the early surveys, we decided to give each student a set of 35 questions. In addition to attempting to identify the mobile game, the introductory questions investigated other aspects of the students' use of electronic devices. According to the statistics, the gender breakdown of the students reveals that almost seven in ten (69.9%) were female students, while only 30.1% were male students who answered the questionnaire. The respondents come from six faculties, each offering a unique set of programmes and classes. Students from the accounting, business management, computer

and mathematical sciences, administrative science and policy studies, information management, and college of creative arts faculties, and students from the college of creative arts. There were 412 respondents, 71.2% of whom held diplomas, and 167 respondents, 28.8% of whom held bachelor's degrees. The lecturers carried out all of their correspondence with the responders through the use of the WhatsApp app. It has been made clear to the respondents that any information they provide will be kept strictly confidential and only used for the study. The results were summarised in Table 1, which may be found below.

Table 1. Demographic Background

Variable	N	%
Gender		
Female	405	69.9
Male	174	30.1
Age		
19 years old	142	24.5
20 years old	226	39
21 years old	56	9.7
22 years old	76	13.1
23 years old	56	9.7
24 years old	23	4
Faculty		
Faculty of Accountancy	68	7
Faculty of Administrative Science and Policy Studies	82	14.2
Faculty of Business Management	114	19.7
Faculty Computer and Mathematical	268	46.3
Faculty Information Management	34	5.9
Faculty of Accountancy	13	2.2
Undergraduate		
Diploma	412	71.2
Bachelor	167	28.8

4.2 Video Game

The majority of respondents (61.3%), when asked how much time they spent playing video games, answered that it was less than three hours each day. After that, three to six hours were devoted to playing various games. The questionnaire has been enhanced to include a new question in order to collect information regarding the types of gaming devices that have been utilised by the respondents. The results, which can be found in Table 2 below, show which device the respondents used to complete the survey.

Table 2. Gadget use most often.

Gadget	N	%
Smart Phone	557	96.2
Computer / Laptop	392	67.7
Tablet(iPad/Tab)	46	7.9
Video Game Console	35	6

The result indicated that 77.3% of students (N = 446) liked playing video games, in contrast to the 22.7% of students (N = 131) who did not share this sentiment. 61.2 percent of them consistently play for three hours or more each and every day, while 8.2 percent play for close to 12 hours, which is equivalent to one-fourth of the entire 24-hour period. As seen in Table 3, most respondents find downloading video games is more convenient than borrowing them.

As of September 2020, a breakdown of the smartphone gaming population in Malaysia is based on the average amount of time spent playing. A poll on gaming and eSports was conducted in September 2020, and 61 percent of respondents from Malaysia claimed that they spend an average of between one and ten hours a week gaming on their smartphones. This puts them in the moderate gaming group of gamers(Breakdown of Smartphone Gamers in Malaysia as of September 2020, by Average Time, Spent Playing, 2022).On the other side, 6% of respondents indicated that they spend over 25 hours per week playing games on their mobile phones, which places them at the end of the category of heavy gamers shown in Figure 2.

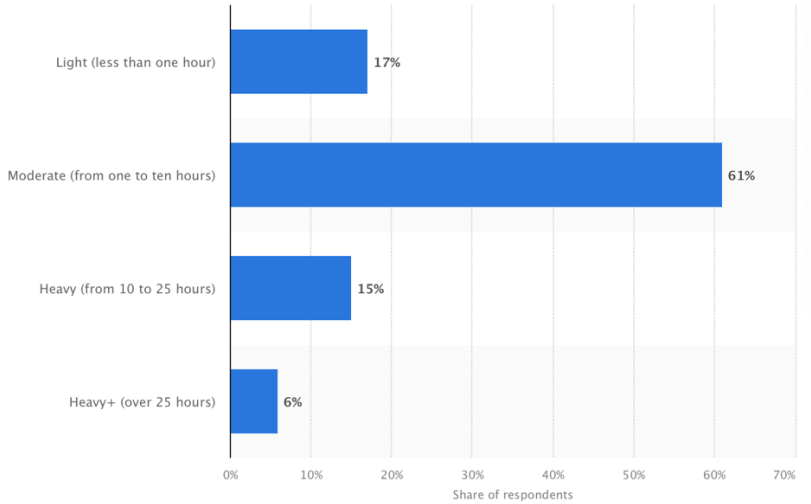

Figure 2: Average time spent playing by Malaysian
https://www.statista.com/statistics/1257921/malaysia-smartphone-gamers-by-duration-of-play/

4.3 Type of Video Game Play by Students

The video game genre is unique compared to other types of games, such as action, adventure, fighting, platform, racing, role-playing, shooter, simulation, sports, and strategy (Yi, 2017). According to the responses on the Likert scale, the vast majority of respondents (58.1%) enjoy participating in action-packed video game experiences. As shown in Figure 3, 33.4% of all games played are educational games, which use game-based learning to educate students in the classroom.

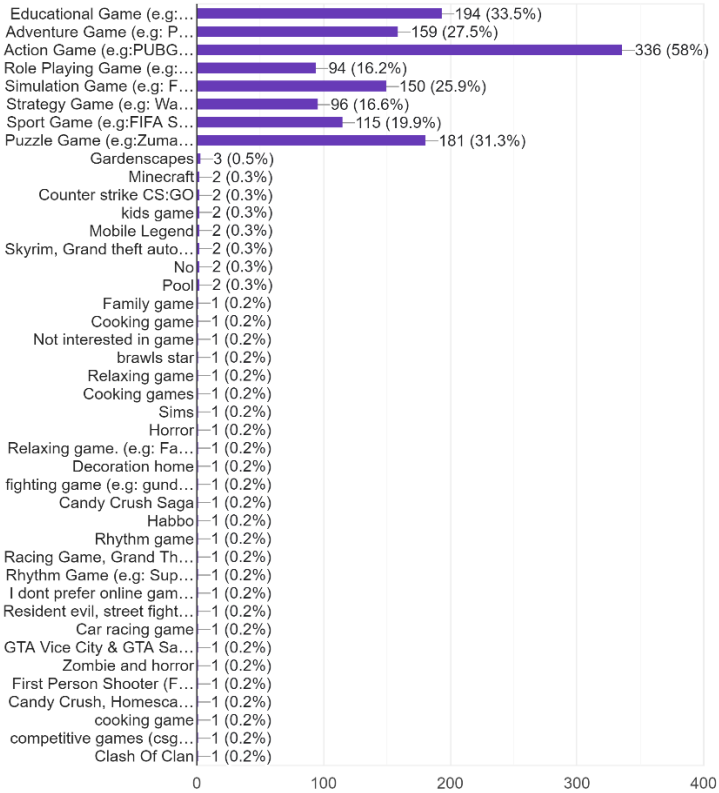

Figure 3: Game genre that most play by respondents

4.4 As a consequence of having irregular sleeping patterns

According to (Romeo et al., 2013) ;(Chindamo et al., 2019), sleep disruption was widespread throughout childhood and adolescence, with prevalence rates ranging from 20 to 40. (N:357) 61.9% of respondents reported that playing video games, which contributed to the problem, was one of their bad sleeping habits in response to one of the questions on bad sleeping habits. The fact that students enjoy staying up late playing video games makes it likely that they will have trouble falling or staying asleep if they keep doing so. On the questionnaires, which are generally seen as a reliable method for evaluating one's level of sleep quality, the vast majority of respondents said that they play video games for more than three hours daily or more. According to the findings of a study that was carried out on teenagers in Hong Kong between the ages of 10 and 19, technology increases the likelihood of developing poor sleep habits. The study found that 86 percent of the sample used electronic devices with screens, and 56 percent reported having problems sleeping.

4.5 An Attribute to Behavior

Because the purpose of this analysis is to determine screen addiction, it was necessary to ask questions that examined the characteristics that each responder had developed as a direct result of playing the video game. The ever-evolving nature of gaming behaviour, which is inextricably linked to the mechanics of the game itself, is one of the factors that affect how people act when they are participating in the activity of playing video games. In general, the respondents reported that playing video games made them feel better, less stressed, happier, calmer, and more thrilled, with 64.8% reporting delight when they play video games. Even though some experienced negative traits like paranoia and selfishness, it did not impact the respondents' overall preference for the conduct they chose after playing video games, which was 1.9% and 2.1% (N:11 and N:12, respectively).

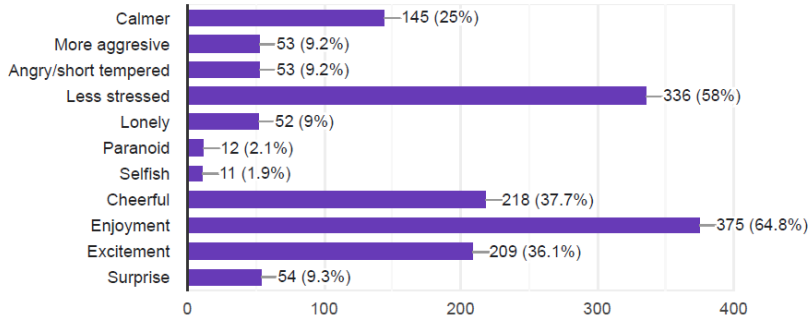

Figure 4: Behavior characteristics after playing video games

The vast majority of students who responded "no" to the question concerning whether or not they play video games stated that their participation in class and performance on their assignments were not negatively impacted by their gaming habits. The findings also revealed that participants in the study experienced lower stress levels when participating in activities involving video games. In addition, 72.6% of people who responded to the survey believe that playing video games affects how people behave.

4.6 Interface for games is preferred.

For the study on interface preferences, the respondents' responses are given in Figure 5. There, they reveal that their second and third favourite game interface features are character designs and game awards.

Students play video games for various reasons, one of which is to improve their achievement, which has proven to be the most important factor. Students receive a sense of success as a reward for winning games, which is fun for everyone involved. Character design is extremely important in action and adventure games, which are two types of games. Some players associate the requirement that they complete each mission as outlined by the game's designer in order to go on to the next level to their desire to

demonstrate their capacity for analytical reasoning and the ability to find solutions to complex issues. The mission and inventory, in addition to several other aspects of the game, enticed the other respondents to play the video game once more, they added. The conclusion will provide a more in-depth discussion of the findings pertinent to the argument.

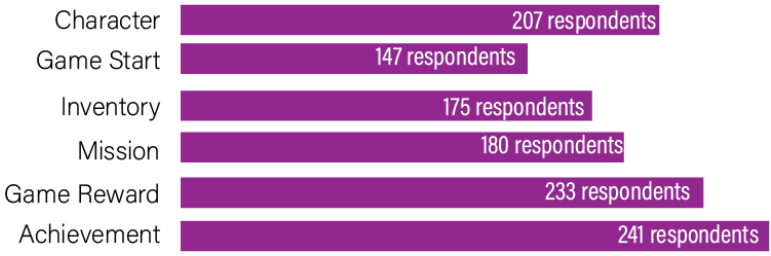

Figure 5: The preferable item in the game interface

4.7 Behavior in-game avatar

Among the students who responded to the question on the game avatar, 179 students, or 30.9 percent, selected the option to personalise the avatar following their preferences and to alter their appearance whenever they played the game. The next 124 students are those who don't change a thing about their in-game character and use it the same way each time they log in to the game.

4.8 User interface of game-based learning

The user interface of an information system is an essential component, particularly when considered from the user's point of view. Developing user interfaces (UIs) for software has traditionally proven difficult. As a result, it is of the utmost importance to incorporate tools, techniques, and procedures into the user interface development process that can take advantage of the most recent advancements in both hardware and software. Generally speaking, user interface design strives to increase usability, measured by five quality components (learnability, efficiency, memorability, errors, and satisfaction)(Jakob Nielsen, 2012; Tharatipyakul & Pongnumkul, 2021). Designers can create a better user experience if user interfaces can be tailored to the specific needs of each unique user. It is necessary to know both user experience (UX) and user interface in order to be able to monitor and increase levels of customer satisfaction (UI). Player motivation, learning content, and gameplay are three more factors that may aid in the learning process and help determine how much is learnt and how significant the relevant attributes are (Abubakar et al., 2017). Creating a user interface for game-based learning necessitates incorporating a wide variety of interface elements, including but not limited to text, image, visual perspective, music, sound effect, voice, colour, graphics, layout, shape, form, and texture.

Perceive Learning	Game Aesthetics	Operational Definition
	Text	Text can be used to represent everything that can be read or typed, including on-screen conversation, menus, and button labels.
	Image	The graphic represents an outside perspective of the area inside the context of the narrative game.
	Visual Perspective	For the game, the term "Visual Perspective" refers to either the first-person or the third-person game perspective.
	Music	The music for the background is taken from the game's accompanying soundtrack.
	Sound Effect	A sound effect represents the noise produced by an item within the narrative game (other than music and voice). Some ambient sounds are the sound of a waterfall, birds, and clicking buttons.
	Voice	Under the context of the narrative game, voice refers to a character's voice that the player does not control.
	Color	Color acts as a symbol for each colour utilised in the overall aesthetic of the game's narrative setting.
	Graphic	A graphic is any form of visual representation of an object that is observed and thoroughly explained. Several of them are also referred to as symbols for icons—for instance, the button or arrow mark on each pickable object that the player can handle.
	Layout	Layout describes the arrangement of text and graphic components in dialogue boxes and menus for narrative video games.
	Shape	Shape serves as a distinctive 2D representation of one of the aspects of art.
	Form	One of the aspects of art is represented by the shape in a separate 3D area.
	Texture	In the narrative game, every 3D object has a texture that describes the nature, consistency and feel of a substance or surface.

Table 3 Revised conceptual model of the user interface in creating a perceived learning by Abu Bakar, (2017) for game-based learning

5.0 Discussion

This section displays the quantitative data analysis findings based on the students' responses regarding their preferred user interface. To be more specific, students were asked to submit their opinions about the end product of the video game and the user interface. In addition, the contextual data of the students were saved in excel files, and these files, along with the student's responses, were examined in order to determine the prevalence of screen addiction among undergraduate students.

The feedback made by students was subdivided into the three main categories of the video game, user interface, and game-based learning for the purpose of analysis.

5.1 Video Game

The findings showed that 77.3% of students (out of 446) liked playing video games. This was in contrast to the 22.7% of students (out of 131) who did not share this feeling. 61.2 percent of them play consistently for three hours or more daily, while 8.2 percent play for close to 12 hours, equivalent to one-fourth of the entire 24-hour period. On the basis of the replies obtained using the Likert scale, the vast majority of respondents (58.1%) take pleasure in taking part in action-packed video game experiences. 33.4% of all games that are played are educational games, which employ the utilisation of game-based learning to educate students while they are in the classroom.

5.2 User interface

The respondents' responses are presented here for the research project's aim on people's preferences about interfaces. They show in that section that their second and third favourite game interface aspects, character designs, and game prizes, respectively, are tied for second place. Students play video games for various reasons, one of which is to increase their achievement, which has been demonstrated to be the most important element. Students play video games for a variety of reasons. When students win games, they are rewarded with a sense of accomplishment, and the experience is enjoyable for everyone involved. The creation of playable characters is of the utmost significance in both action games and adventure games, which are subcategories of games. Some players view the requirement that they complete each mission as outlined by the game's designer to move on to the next level as an opportunity to demonstrate their capacity for analytical reasoning and their ability to find solutions to complex problems. This requirement supports this line of thinking is a prerequisite for moving on to higher levels in the game.

5.3 Game-based learning

When analysed from the user's perspective, an information system's user interface is revealed to be an indispensable component. Historically speaking, the creation of user interfaces (UIs) for software has been a challenging endeavour. As a consequence, it is of the utmost importance to incorporate into the process of developing a user interface tools, techniques, and procedures that can make use of the most recent advancements in both hardware and software. This is because these tools, techniques, and procedures are capable of taking advantage of newer technology. In general, user interface design aims to promote usability, which may be quantified using five different quality components (learnability, efficiency, memorability, errors, and satisfaction). Player motivation, learning content, and gameplay are three more aspects that may aid in the learning process and help determine how much is learned and how significant the relevant traits are. All of these factors can potentially play a role in the learning process. While designing a user interface for game-based education, it is necessary to include a wide variety of interface elements. Text, picture, visual perspective, music, sound effect, voice, colour, graphics, layout, shape, form, and texture are some of the elements that may be included in this list; nevertheless, this list is not exhaustive.

6.0 Conclusion

According to the findings of this study, the undergraduate students attending the Kedah Branch of the University Teknologi MARA have fewer negative impacts due to playing video games. There was scant evidence to suggest that actively engaging in the activity of playing video games had any direct bearing on behaviour. The development of a negative behavioural trait as opposed to a positive one by an excessive gamer has the potential to affect the lifestyle of each response. However, destructive sleeping behaviours may result because it is of the utmost importance to control which players are most at risk for developing a health condition and because these players cannot be addressed sooner. Most of those who participated in the survey confessed that they already devote most of their time to playing video games because they have developed physical addiction. These days, sleep disorders and addiction to video games are at the forefront of practitioners' minds worldwide. Nonetheless, considering that we are currently undergoing the fifth industrial revolution, excessive participation in online gaming has contributed to the expansion and improvement of internet connectivity. Most publications published in the middle of the 1990s concentrated on internet gaming as a kind of therapy for addiction to video games.

The user interface needs to be implemented, as well as the interface's influence on various process and outcome measures. In addition to the user interface, the research outcomes also demonstrated a connection between user motivation and the following aspects. Respondents stated that the rating and reward systems encouraged them to play both sorts of video games (video games and game-based learning), which was a positive indicator given that the lecturer had developed video games as an alternative mode of instruction, particularly about prizes and grades. When it comes to the user interface, using the preferences of the video game as a guide can assist in making game-based learning more effective in the classroom. In addition, the students suggested to the educator that creative and imaginative activities should be designed to maintain their interest in the material. In order to make the activity more interesting, the educator needs to delve deeper into the game's mechanics and every other part of the game.

Acknowledgement

The author wishes to thank ReNeU UiTM and ILD UiTM for facilitating the writing and publication workshop as well as the College of Creative Art, Universiti Teknologi MARA Kedah Branch, Malaysia and Centre for instructional Technology & Multimedia, Universiti Sains Malaysia, Malaysia for supporting this research.

Article Contribution to Related Field of Study

This article will add to the related field of study, specifically focusing on developing the user interface to create a pleasant game-based learning experience for users.

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