PRESERVING THE IDENTITY OF ANCIENT EGYPT IN EDUCATIONAL CULTURAL GAME DESIGN
الحفاظ على هوية مصر القديمة في تصميم الألعاب الثقافية التعليمي

George Morcos
Graphics and Media Department, Faculty of Arts and Design, The British University in Egypt

جورج مرقص
قسم الجرافيك والاعلام – كلية الفنون والتصميم – الجامعة البريطانية بمصر

georgenad@gmail.com, george.morcos@bue.edu.eg

ABSTRACT

This study determines the importance of integrating multimedia in education specially in the primary education, which impose a rich use of recent techniques, helping in innovation new approaches which improve the quality of education and the facilitate receiving the information. This standardize the principles of adding typograph, videos, audio, animation, and drawings ratios especially in the ancient Egypt cultural educational games that is used in education. The aim of standardizing these principals is to help the graphic designers to build a successful cultural game built on scientific historic bases, to maintain the identity of the culture, which is the Egyptian culture in this study, this historical background is reflected through design vocabulary which is typography, textures, audio, animation and drawings ratios. Educational games give a visual message through all its details, therefore studying the design vocabulary from a historical aspect is a very important in designing these types of games.

KEYWORDS

Education; Game Design; Ancient Egyptian**;**

الملخص

تحدد هذه الدراسة أهمية دمج الوسائط المتعددة في التعليم، خاصة في التعليم الابتدائي، مما يفرض استخدامًا غنيًا للتقنيات الحديثة، الذي يساعد في ابتكار مناهج جديدة تعمل على تحسين جودة التعليم وتسهيل تلقي المعلومات. يعمل هذا على توحيد مبادئ إضافة نسب الكتابة ومقاطع الفيديو والصوت والرسوم المتحركة والرسومات خاصة في الألعاب التعليمية الثقافية عن مصر القديمة المستخدمة في التعليم. الهدف من توحيد هذه المبادئ هو مساعدة مصممي الجرافيك لبناء لعبة ثقافية ناجحة مبنية على أسس علمية تاريخية ، للحفاظ على هوية الثقافة ، وهي الثقافة المصرية في هذه الدراسة ، هذه الخلفية التاريخية تنعكس من خلال مفردات التصميم التي هي نسب الكتابة والملامس والصوت والرسوم المتحركة والرسوم .تعطي الألعاب التعليمية رسالة مرئية من خلال كل تفاصيلها، لذا فإن دراسة مفردات التصميم من الناحية التاريخية مهمة جدًا في تصميم هذه الأنواع من الألعاب.

الكلمات المفتاحية

التعليم؛ تصميم الألعاب؛ المصرية القديمة

Copyright © 2023 | Copyrights are granted to JAARS

1. INTRODUCTION

Modern Communication technology has developed rapidly becoming one of the most important and fastest systems especially in the field of modern digital design, most computers and telephones have become portable in the hands of people of all ages touch screens, such as the iPad and other modern technology allow the user to enter the Internet easily anywhere and anytime, Therefore, it is necessary for the education to utilize this great technology revolution to develop the education process and help the students to receive the information easily and effectively

Education through game design is an effective way to attract the students and preserve the historical identity of different cultures specially in the field of history specially in the early educational stages, where students gain the information visually through the colors, textures, drawing buildings, characters and clothes, these elements are the elements of building an educational game design which varies than different entertainment games, thus this specific game designer has to study the history of different cultures from different aspects in order to succussed in designing an educational game visually informative in all its details.

This paper is considered as a guideline to all the game, graphic and visual designers who are working in the field of educational game designs to follow the identity of the culture they are presenting in their games, to preserve the identity of the culture and enrich the educational game with visual knowledge and indirect information hidden through design elements, user interface and user experience.

Where the visual communication technology nowadays integrates in all fields of knowledge to create effective results, as it is the way of sending a visual message from a sender to a receiver, through a visual medium, so designers should study the history of the culture they present in the game design including all its details and elements to enrich their games and create successful educational games accurate in all its details.

The success of the game also depends on the designer's thinking and information by presenting them through visual forms including advertising, calligraphy, drawing, graphic design, illustration, and colors. There are some aspects that highly affect the success of graphic design goals, as follows:

1.1 Communicational Message Aspect

The target of any graphic message is to facilitate the communication between two parts such as product and customer or teacher and Student etc., so it’s very important for the designer to study well the features of the target audience in order to choose the appropriate tool for sending the visual message.

1.2 Functional Aspect

Graphic design is definitely having a specific function, for example the highway outdoor banner usually gives a very brief and rapid information due to the nature of the audience as they receive the message while driving so it has to be very brief and to the point, unlike indoor poster it gives a full information about the topic, more over the brochure gives a full detail about the topic.

Copyright © 2023 | Copyrights are granted to JAARS

Here we can find the game design in Cultural education has a function of transferring the culture features to the students or player also simplifying the complicated historical events in a simple joyful way that attract the students and transfer the accurate knowledge indirectly, this comes from taking in consideration all the artistic rules of illustrations and colors in the right way according to a specialized research and study of the target culture.

1.3 Psychological Aspect

Targeting a specific group of audience is challenging, if the products fit a specific age, the design should reflect this idea accordingly, and absolutely the design should target this category, otherwise it gives a negative response.

In addition, the arrangement of the graphical elements, Grid system and layout design has a very great psychological effect on the audience for example, The readability of design and the aesthetics values are strongly affected by the white space in the designs. This space and relations between various elements are called proximity. (J. H. Bear., 2012; R. Williams,2008; A. White.,2002)

1.4 Aspect of Visual Perception

For example, the design targeting old age should have specific features that fit their ability of perception, readability, age and culture, the designer should avoid using small sized text and the strange fonts, as well as the warm background colors, in order to maintain high slandered of readability for the old age audiences.

2. AIM

Game design is considered one of the latest challenging technologies that can be embedded in the education process specially in the field of historical studies, where the schools and universities history courses can use game design to facilitate transferring the information and help the students to imagine the culture of different civilizations through a visual interactive game design that held in its details a visual informative message. So this research aimed to highlight the different atheistic details that should be included in these historical educational games, in order to come up with a useful accurate informative game to be used as a guide for all game designers who will design games related to ancient Egypt.

3. HYPOTHESIS

Visual interactive cultural game design is a very effective method in history courses education due to the nature of history which needs imagination from the student to move from occasion to occasion and from era to era, thus; games help in arranging this sequence of eras and facilitate it by its nature as stages, where the student in this case is the player who can't move forward to the next stage without passing the previous stage which helps in arranging the information, easily understand it and enjoying studding this kind of sophisticated subjects. Also, cultural educational game design helps to document the ancient cultures such as the Ancient Egyptian culture in an interactive informative way other than the traditional documentary films, which sometimes are boring and lakes creativity.

So it's important to create well established game design that follows the identity of a specific culture or era as a kind of educational tool is very challenging, where the designer should make a detailed research about the culture or era that should be presented in terms of the design

Copyright © 2023 | Copyrights are granted to JAARS

elements and stages, and should also pay attention to all the details to follow the artistic rules of the targeted culture, such as colors, texture and drawing techniques in all the game design aspects like UI and UX.

4. QUALITATIVE RESEARCH METHODS

The researcher's objective was to create a guide lines for the ancient Egyptian identity for the educational cultural game designers to improve the quality of game design especially the historical educational games that is related to Ancient Egypt, this challenging topic arose to the researcher when he was invited to the inaugural meeting of a new digital humanities project combining African heritage conservation with new immersive and gaming technologies arranged by University of Illinois Urbana Champaign, USA, on Friday, November 1, 2019 at the Discovery Partners Institute in Chicago, Illinois. The goal of the project was to develop a games-frame worked teaching and research product which called a "scholarly gaming environment", a group based at the University of Illinois Urbana-Champaign with a project sponsored by the Discovery Partners Institute in Chicago, Illinois. The purpose of this meeting was to explain the progress of the project based on the work that was already done on campus, and to solicit the ideas on the convergence of African heritage, new technologies and gaming from the attendees at the meeting who were a wide range of academics, students, gaming industry professionals from Illinois. There was a huge contribution from two important heritage conservation specialists based on the African continent: Prof. Heinz Ruther of the Zamani Project of the University of Cape Town, South Africa, who shared his experience in the virtual reality cameras and how to implement it in the game design and Dr. Mohamed Diagayete director of the Ahmed Baba Institute in Timbuktu, Mali, who shared his experience in documentation of manuscripts in a digital form and the researcher who talked about the ancient Egypt heritage and how to implement the ancient Egyptian details of drawings in game design..

A lot of ideas were presented and discussed in that meeting, which challenged me as a specialist in graphic design and interactive design as well as an academic member to find out solid out lines for game designers based on the ancient Egyptian heritage to design true accurate informative educational game design.

5. EXPLANATION OF THE METHODS CHOSEN

The research is based on personal observations in Egypt monumental places and historical areas as well as observing the ideas that were shared, presented and discussed in the USA meeting by Prof. Heinz Ruther of the Zamani Project of the University of Cape Town, South Africa, and Dr. Mohamed Diagayete of the Ahmed Baba Institute in Timbuktu, Mali. Also, personal readings in different resources that the researcher referred to later.

6. DIFFICULTIES FACED DURING THE RESEARCH

The project is a new method in the field of education, and thus there is a lack in resources about the educational games specifically, also in this type of games there should be a bond between the graphic designer, computer science and coding engineer as well a specialist in history in the target era, all work together in a harmony to come up with an informative true game, however there is some companies specialized in game design worldwide has begun to release cultural games, but it lacks the accurate details in drawings, face features, textures, costumes

Copyright © 2023 | Copyrights are granted to JAARS

and places which is acceptable as an entertainment games but not accepted as an educational game has to be very accurate and informative in each and every detail.

7. EVALUATION

The education process has developed very quickly nowadays. Visual technology plays a fundamental role in developing ways of education and facilitating access to information, such as e-learning and blended learning. Education through game design is a promising method that facilitates receiving information in an interesting way that is very adequate to the nature of history courses. Also, game writing is an important field of study to enhance this industry, especially the educational game designs, it brings useful information for the field. (Seth Hudson, 2022). The most important part in these games is the designing processes which must follow the ancient Egyptian identity considering all the details in drawings and integrate these details with the new technology to come up with a true, accurate and informative game.

8. DEVELOPMENT OF GRAPHIC DESIGN TOOLS

Recently the definition of graphic design is focusing more on visual communication methods unlike the old definitions about the types of printings.

Design is organizing different elements together like typography, photos, illustrations or icons, sending a visual message with a specific form that follows a specific function to target audience.

In contemporary definition of graphic art there is integration between digital technologies and fine or applied art to send visual message.

Graphic design connects different design elements like text and pictograms creating multimedia art. It passes by different phases, from static to reach dynamic phase combining different advanced techniques such as virtual and augmented realities, traditional animation and 3D printing, to come up with an attractive interactive visual message.

8.1 The benefit of using interactive designs in education

The revolution of information technology and communication helped a lot in the development of educational methods and influenced the modern technology to help both the teacher and learner. Due to the rapid growth in the technology's potential in setting the goals, the objectives, the planning of the learning environment. (Tahar, 2006)

Educational methods that lack interactive and innovative techniques are boring and unattractive to the students, especially in the primary stage, also it never comes up with the targeted goals.

However, using an interactive media like games makes novel environments where students dissolve and playing while learning simultaneously at the same time.

Interactive designs applications like educational applications or games is a successful method of learning that has very useful impact, used to achieve different goals such as:

- It highlights different capabilities.
- Deepening creative skills.
- Deepens student learning.
- Encourage critical thinking.
- Help students to create creative problem-solving.

Copyright © 2023 | Copyrights are granted to JAARS

8.2 Process of interactive design

This stage depends primarily on a fundamental aspect of design that is directly related to sensory and cognitive awareness as well as design awareness, and this aspect is concerned with the fundamentals and philosophy of communication design in terms of form and meaning perceptions as well as design value and goals, beside the ability to Understand the ideas that confirm these philosophies.

Humans feels and interact with his surrounding environment by how he perceives the elements that surrounds him, or the habitat that he lives in, to know the different factors that surround him by using his senses. But not only the senses or the sensory factors of the objects that make the person feels or interact with his surroundings, it is also about the extensive information about his surroundings elements.

Studies show that visual perception occupies the first position in the cognitive powers of man, providing it with a comprehensive perception of the visual environment in a direct way.

8.3 Visual perception of shapes and bodies

The process of perception involves physiological abilities related to the functions of the members controlling the mechanisms of receiving the visual message. Therefore while designing, it is important for the graphic designer to be aware of the perception phenomena of the target audience and the factors that affect this perception, in order to make sure that the message he is trying to achieve will be perceived in a right way by the viewer.

Before evaluating a graphic design effectiveness, the designer makes different analysis to make sure that his design is balanced, and the design's visual plan will be well perceived and thus the design's message is clear through all the design principals. (Peter O'Donovan, Aseem Agarwala., 2014)

As long as the designer is aware of these cognitive abilities, he can use different methodologies in design thinking along with various techniques of layout to create consistency in design, relation between design elements to achieve the aesthetic and function goals, whether it is two-dimensional or three-dimensional.

How to understand the information, and identify the formal values that express the content to be expressed, is one of the most important design perceptions that the designer builds the shape based on as a reference value, to reflect the basic features of the design in terms of form and meaning, as well as value.

The designer's cognitive factor creates a kind of system that qualifies him to produce a successful design that serves its purpose, whether it is aesthetic or functional, utilitarian.

Due to the increasing recognition of the significance of design and its related innovative elements, along with the emergence of new concepts and philosophical theories that have influenced our understanding and behavior, as well as the overall progress of society, cognitive factors have become even more crucial in achieving desired outcomes. Through advanced knowledge and the ability to adapt to new developments dictated by the demands of the times, designers are better equipped to accomplish their objectives.

From this standpoint, the designer deals with these phenomena and factors as an essential input to the creative message, with the aesthetic and utilitarian aspects it carries, and the extent of its

Copyright © 2023 | Copyrights are granted to JAARS

effectiveness in influencing the scenes or future of the communication design process. So it is a stereotype of things that the brain translates the ideas into visual elements. And in this case it transmits the impression from the outside world in the form of an external image and the visual reception process relates to skills related to the ability to feel the location, size, shape and movement of the subjects surrounding the perceived person, as it controls the level of mental activity of the individual and his ability to focus in his position from the visible phenomena surrounding.

The visual perception process also passes through several forms, including but not limited to: the aesthetic view - the process of analysis and the perception of the existing relationships between the vocabularies of shapes - the reconstruction of shapes through the ability of the designer to visualize in a new college form.

8.4 The Process of Visual Perception

Targeted audiences nowadays have different challenges than in the past because of updated technologies, economic crisis, poverty and different other reasons, so the designer should be aware of these new features to create a design that can contact these audiences easily. (Forlizzi J, Lebbon, C., 2002)

The contact is made through the eye through the light reflected from the visuals, which the eye receives via the retina lens, so it has a stereotype on the retina of the varying intensity levels of the entrance from the various surfaces and the objects that make up these surfaces. The nerves then transmit signals to the brain, thereby completing some physiological and chemical changes in the muscles, nerves, and brain cells that cause awareness of things and sensation and stimulate thinking, desires, and response capabilities.

The mind plays its role in conveying this impression from the outside world in the form of external images and the visual reception process requires skills related to the ability to feel the location, size, shape and movement of the subjects surrounding the perceived person and controls the level of the individual's mental activity and his ability to pay attention in his attitude towards visual appearances.

9. WHAT IS GAME DESIGN

it is the combination and integration of computer science/programming, illustrations, animation, idea and visual communication. Where design principals integrate with the rules of aesthetics to finally have a successful game design used as an entertainment and educational aims.

Games' rules and principles are the same as interaction programs which called gamification.

Game Design Team:

- Designer for game levels
- Script writer
- Story board illustrator
- Graphic designer
- Computer Programmer
- Interface creator

 Copyright © 2023 | Copyrights are granted to JAARS

9.1 History of Game Design

Virtual Life games is the kind of games where game players patronize and immures in virtual life. The famous example is "The Game of Life", a cellular robotic game designed - John Conway in the 1960s. (William L. Hosch, electronic artificial life game, 2009)

William (Will) Wright is the first American programmer and founder of Maxis Software to design games, which was a great mutation in game design specially life games in which players have the ability to choose individuals and objects to live on their planet according to the climate and different other criteria; SimEarth (1990) is considered to be the first Successful interesting a-Life game designed by William Wright, compared by his previous game SimCity (1989), then he developed *SimAnt* (1991), which was a great development in the design of the game where the gamers take role of a yellow ant that struggle to build a colony against another computer controlled colony of red Ants, in this game a great progress had taken place on the computer tools and in the colors and the drawings as well. In 1992 Maxis followed his game series by *SimLife* (1992), which was a bit different than his last previous ones, for sure its was also a Life Game but its story gets away from the Insects or Ants to direct his new game to the plants, animal and the environment; this game was later used to teach students in the schools to learn about the animals , carnivores, herbivores, Omnivores and plants interact together building the balanced ecosystem. Maxis didn't stop at this point but developed his games among years and developed several games like: The Sims (2000), the best-selling game at that time; *The Sims* , its sequels *Sims 2* (2004) and *The Sims 3* (2009 till 2008 where he developed Spore (2008) a Life Game , but is completely different from his previous Style, where the gamer an create his own creature and upload it to specific data base where the compatible environment to this newly electronic creature is developed and the rest of elements of this new ecosystem will be developed, no this only but also the gamer can share his creature with other players created creatures and can examine how his new creature can interact with others in their different habitat and finally can upload all his experience on you tube.

9.2 Cultural Game Design

Games designer who designs games for special eras, should be aware of the history of this Era and what is distinguish in it. Also He should know the target students or players, which age, which knowledge and the level of education.

Designer has to ask himself some questions like:

- The aim and outcome of the game that the player should learn.
- From where should I begin which period I am going to focus on in this Era?
- The idea of the Game that should be relevant to the era of this cultural heritage.
- The theme he is going to use.
- How many levels in the game and till which period it will ends (for example in the ancient Egyptian it may be 3 levels: the old kingdom, the middle and the new one together with the Dynasties)
- The colors, textile or textures that will be used in this period.

9.2 Cultural games design principals

The quality and new way of teaching in the educational process is directly affected by the technological innovations, (Abbas, Hareth & Aldalalah, Osamah, & Alhalaq, Ali., 2014) Like

Copyright © 2023 | Copyrights are granted to JAARS

the huge technology of game design accompanied by the virtual reality and the interactive designs too.
When designing a game for a specific culture or country, you have to stick to its identity through.
some visual factors. Such as:

- Theme
- Colors
- Illustrations
- Typography
- Music
- Animation
- User interface
- User experience

9.4 The theme of the game

It depends on some factors:

- The target audience(player) age
- The player experience in games.
- The era represented by the game.

The idea should reflect the Era, this will play a master role in the game design.

For example, if the game is about the Greek age, then the designer should represent the Greek history through the game but in this case the game will depends mainly on the vase paintings as most of the knowledge about the Greek art comes from the vase paintings.

And here the designer can find a lot of ideas about its stories and the different purposes behind it.

So the game designer here is obligated to study the vase painting and its development among the ages and this will inspire him, and thus the game will definitely varies from a “pharonic” game that surely will be based on building or treasure finding or some games that were invented by the ancient Egyptians.

9.5 Colors

When designing a cultural graphic design, the color palette should reflect the culture, Identity and heritage. For example, Ancient Egypt colors were very bright, the gold was widely used in most of the drawings, also the beige color of the temples and dessert is a very important tone in any Egyptian palette.

9.6 Illustrations

The game designer should study the eras’ illustration rules, for example:

- The ancient Egyptians has their own beliefs which reflected on their drawings and other sculptures.
- Ancient Egyptian artists build his grid system which determined some strict ratios.

 Copyright © 2023 | Copyrights are granted to JAARS

- The truth was the key word of the Ancient Egyptian art as they tried to express all the details and proportions in a true position.
- Perspective appeared in a composition form.
- It represents 3D figures in a geometric structure via a 2D space.
- They typically used vertical perspective, the size shows the value and importance of the person.
- Human figures were painted and sculptured from the best angle they appear.
- Heads, nose and lips appear from a side position.
- While eyes appear in a front position although the face is from side position.
- Also, shoulders appears from the front side.
- Torsos and hips appear from three-quarter position Where legs as well as arms appears in side position and overlaps while walking.
- The Ancient Egyptian artist drew kings and queens or any couple aside to each other with overlapping in arms.
- Kings and well-known people are presented in full body structure.
- Other unimportant people and slaves are presented in an overlapping position.
- Ancient Egyptian artist presents locations with the same technique of drawings using the truth law in all his drawings
- In the wall drawings of Queen Nefertari serving the Gods, who are sitting in a side position. The table-legs appear in a front side while the top of the table appears from above and the food on the table appears vertically, to be clear to the audience.

Game Designer of such era has to draw all the illustrations taking in consideration the previous ancient rules of this era, which will definitely reflects the identity of the "pharonic" age.

9.7 Typography

- The fonts should be designed in relation to the culture represented by the game.
- Consider Typography as a main factor in the success of the game.
- Typography should be consistent and following the readability rules such as the measure length, leading, kerning and tracking.
- Alignment should be considered according to the language, but avoid centered alignments, try as much as possible to avoid justify and hyphenations.
- Apply the grid system in your layout whether columns of paragraphs but avoid widow lines and orphan words.

9.8 Music

Should be relevant to the Era and the age of the target audience.

Even the audio like the sounds that results as a reaction of the player actions should also reflects the era and the materials used in this era.

9.9 Animation

Animation is an important and effective element of digital games.
It attracts the players to the subject of the game.
It introduces a dazzling sparkle.
It decreases monotony and boredom.

 Copyright © 2023 | Copyrights are granted to JAARS

10. GAME DESIGN PRINCIPLES

Increase positive rewards more than negative punishments.
Start the design gradually from the easiest level till the most difficult level.
Friendly User interface and easy to learn

10.1 User Interface

Game design user interface aims to facilitate the user tasks inside the game world easily in an interesting easy way to achieve his goals.
Advanced UI is now applied by virtual reality which helps users to achieve goals in a virtual space using specialized devices, cameras and sensors.

10.2 Use of Shape and Color in UI

- Shape and color in game design special cultural and historical games, is designed according to a detailed study held by the designer about the elements of design used in this culture or era, to manipulate the user's emotions to give a certain emotion and thus a distinguish experience.
- The use of colors should be used according to the psychological theories about human perception and according to the colors used in this era, which plays an important role in immersing the user player or student in this ere and indirectly send him informative emotional messages.

10.3 User Interface Classifications

UI is classified into four classes: **Non-diegetic, Diegetic, Meta, and Spatial** according to how linked to the game narration and to its place in the game design.

Diegetic

It appears within the design of the game (fiction and geometry) the user as well as the character or avatar interact and gain visual or haptic or audiable information through this UI.

Meta

Its 2D UI elements which don't appear in the game design world, appear separately on the screen.

Spatial

It appears when there is a need to break the narrative to give the player more information that the avatar or character shouldn't know.
It helps to immerse the player within the game design as helps to guide the player to certain information and places, it appears within the game design preventing the user to open extra menus.

Non-diegetic

This UI can be separated and removed from the game design, whoever it follows the guide rules of the game design identity and style, it is used when the other UI types are not adequate to give certain information.

Copyright © 2023 | Copyrights are granted to JAARS

10.4 User Experience

User experiences is built through the user interface as the function of user interface is creating tools that help the player to interact smoothly to achieve certain goals and understand the game easily, therefore clear user interface creates friendly user experience and vice versa, so creating "human-centered user interface design" approach started to flourish. In order to create human-centric technology which comprises multiple disciplines such as psychology and physiology

The increase of interactive techniques technologies whether physical or partially or fully immersion will definitely have positive impact on user experience and creates connections between the player, character and avatar these can be done by several emerging techniques such as VR (Virtual reality) devices, which has now grown very fast to fill the five senses of the human creating a fully immersion medium.

Alleviating the audio designer's daily struggle with complexity is fundamental to putting the player's experience first, but in order to do this, the player has to be of secondary importance when it comes to tool and UX design for technology teams. (Rob Bridgett, 2023).

11. INTERACTIVE DESIGN DEFINITION

Interactivity is related to User experience gained by time and multiple use of the game or application. related to the overall programing and system of the game.

11.1 Conditions for the Success of Interactive Design

Easy to use, effective.
Supportive in use, Sufficient.
Safety.
Interesting.
Friendly use.

12. VIRTUAL REALITY

Computers and electronic devices have a great role in information and technology illiteracy and spreading among societies, they also have an influence on the virtual reality world. (Aldalalah, O. & Fong, S. F., 2008)
It is known as a technology that allows a user to skip a computer screen and enter a virtual world with the help of special tools which enables the user to integrate into this virtual world and interact.
There are five basic components in the definition of virtual reality:

- Involvement
- Immersion
- control
- Presence
- Interaction

The majority of VR applications and software consist of the following three components:

- Visuals
- Audios
- Touch

 Copyright © 2023 | Copyrights are granted to JAARS

12.1 First: Visualizations in Virtual Reality

- Head Mounted Display
- Vertical Boom Monitor
- LCD Flicker Lenses

12.2 Second: Virtual Reality Audios

There are types of sounds used in VR apps including:

- **Monophonic Sound**, which is based on sending one audio signal to each speaker so that sound sounds as if it comes from a single source.
- **Stereophonics:** This technique relies on sending sounds to the speakers in a sequential manner, separating the first and next sound intervals in microseconds and thus seems to come from multiple sources.
- **Surround Sound** this type without a personal headset It emits from the huge speakers and depends on stereo sound technology where the sound seems moving around the listener feels that it is surrounded by sound from each side.

12.3 Third: Touch in Virtual Reality

Virtual objects must be given real touch properties so that users of virtual reality systems can feel the touch. It expresses the extent to which virtual reality applications are simulated by nature. For example, a barrier must stop a person when it collides with it and is not allowed to penetrate it, giving the feeling of different sensations related to touch like sense of the texture of any virtual object.

13. TYPES OF ANIMATION:

• Animation Moving / Animation pictures
Static back grounds and locations with a movable figures or other elements the animation appears due to the changing in the element's angles of view
• Zooming technique
Animation appears due to the magnifying process of elements in different ways, to get the impression that the elements grow up and diminish in size as if moving.
• Morphing images
With this type of animation, the transformation is made by an image that follows the other to give the impression that the image is transforming and changing from one case to another by smooth transitions.
• 3D "Depth" 3D images "depth"
Images with three dimensions simulations are more complex. However, it is easy to create 3D images with special programs like Cinema 4D.

14. CONCLUSIONS

Education process and method has continuous development in order to facilitate transferring the knowledge and information in the easiest way to the students, one of the latest methods in education is the game design as the student can enjoy playing and indirect simultaneously gain the target information easily and effectively as the students in certain age are well fascinated with the games and spend very long time in playing games thus this method will surely be very

Copyright © 2023 | Copyrights are granted to JAARS

affective to the students in most cases but not in all cases as this type of gaming education success depends on several factors;

- The game designer awareness of the identity elements of the target culture or era.
- The awareness of the colors, textures and style of illustrations that is adequate to the era represented in the game design.
- Following the guidelines of the culture and interpret it in a an attractive dynamic way that attach students
- Creating a clear user interface creates positive friendly user experience.
- Choosing the type of user interface that suits the game and facilitates the interactivity.
- Using emerging technologies like VR is very useful in creating fully immersion between the character, player and avatar.
- The age of the student, as not all the ages can accept the idea of gaining information through game, may be in the school level students can accept and enjoy the idea, but in the university level students can underestimate the idea of gaining information through game design.
- Finally, the idea of integrating interactive technology in the educational system facilitates the educational process to both the teacher and the student and enhance the level of receiving the information easily.

15. REFERENCES

Books:

Bridgett, R. (2023). Working with Sound. Taylor & Francis. pp.99

Forlizzi, J., Lebbon, C. (2002). From Formalism to Social Significance in Communication Design", Design Issues, vol.18, no.4, pp.3-13.

Hudson, S. (2022). Approaching a Pedagogy of Game Writing. Taylor & Francis. pp.23

Hodent, C. (2020). The Psychology of Video Games. Taylor & Francis. pp.23-24

O'Donovan, P. & Agarwala, A. (2014). Learning Layouts for Single-Page Graphic Designs, IEEE TVCG , vol. 20, no. 8,.

Williams, R. (2008). The Non-Designer's Design Book. Peachpit.

White, A. (2002). The Elements of Graphic Design. Allworth Press.

Webpages:

Bear, J. H. (2012). Retrieved from http://desktoppub.about.com/od/designprinciples/.

Hosch, W.L. (2009, April) electronic artificial life game, Retrieved from https://www.britannica.com/topic/electronic-artificial-life-game/

Higher Education Video Game Alliance. (2015). Our state of play: Higher ed-ucation video game alliance survey 2014– 2 015. http:// glsstudios.com/ hevga/ wp-content/themes/hevga_theme/assets/2015_HEVGA_Survey_Results.pdf

Journal or special paper from the internet:

Abbas, H. & Aldalalah, O. & Alhalaq, A. (2014). Calendar graduation projects of educational technology at the University in the light of criteria for wall educational software. *Journal of Al-Aqsa University, humanities series, 18 (1),* 143-167.

Aldalalah, O. & Fong, S. F. (2008). *Effects of modality principles among Jordanian students*. 2nd International Malaysian Educational Technology Convention, 5-7 November 2008, Kuantan, Malaysia. Malaysia: Malaysian Educational Technology Association.

Tahar, A. (2006). *Relationship between the spatial configuration of static and animated images in programs, multimedia and educational attainment*. Master Thesis (Unpublished), Helwan University.

 Copyright © 2023 | Copyrights are granted to JAARS