

Review of developmental strides towards the edutainment domain

Steve Joseph¹, Aniket Singh², S. Harish Krishnan³, Vaishali Nirgude⁴

^{1,2,3}Student, Department of Computer Engineering, Thakur College of Engineering and Technology, Kandivali (East), Mumbai – 400101, Maharashtra, India

⁴Assistant Professor, Department of Computer Engineering, Thakur College of Engineering and Technology, Kandivali (East), Mumbai – 400101, Maharashtra, India

Abstract - In recent years, the premise of entertainment and experience has been recognized in the field of education, as it has in other fields. It is indicated that subjects incorporating entertainment attract consumers' attention more, and events providing consumers with a perception are more permanent and recollective. Education is among the fields in which entertainment is quite active. As a result of these specific advancements in this collaborative field, global knowledge now incorporates 'edutainment' as a concept of interest. Edutainment is a term that refers to the combination of entertainment and education, or subjectively, the marriage of education and entertainment. The primary goal of this combination is to supplement education along with the ever-growing field of entertainment. The use of video games in teaching practice is studied multifaceted, along with formats and requirements of educational games, methods for effectiveness assessment, and the effect of games on students. The controversial nature of game-based learning effect on students requires deeper research, as the increase in motivation and learning efficiency cannot be disputed, as well as the negative impact of long gaming on cognitive abilities, emotional state and social skills of students.

In pushing forward this ideology into existence, productivity and adaptability factors with respect to the specific method of throughput play a role of high priority. To help predetermine the possible outcomes of the developed system on hand, this paper provides a review specifically on the 'educational gaming' industry in respect of aforementioned factors and beneficial collaborative opinions.

Key Words: Educational games, Edutainment, Serious gaming, Teaching, Learning

1. INTRODUCTION

Due to the rapid evolution of technology, instructional games and simulations are now frequently used in schools across the nation. There is already a substantial corpus of research that examines the relationship between gaming and education. Games enabled by the internet have become increasingly popular in recent years. Students, teachers, and game designers all have a vested interest in this area of research because of its relevance to online education. Video games, virtual worlds, and Massive Multiplayer Online Games (MMPOGs) are becoming increasingly popular instructional tools for educators and policymakers.

When it comes to educators' responsibility, instructional media are viewed as an effective alternative to complementing traditional teaching methods in terms of motivating and encouraging pupils to study. Many of these duties go unfulfilled in scientific classes since engaging and motivating learners to engage in class is a difficult undertaking, as several studies have shown. Students, on the other hand, are more excited about learning when it is engaging and interactive. Learning and teamwork can be enhanced using educational games that are interactive. Active learning can be achieved through the use of games, which feature interactive and unique elements. In addition to making the learning process more enjoyable, they also inspire pupils to participate in class and promote a positive attitude toward education. As a result, students who are engaged and actively involved in the educational process are more likely to retain the information they learn, making it easier to recollect later on. Educational games can be used in a variety of ways by teachers to reinforce previously acquired material, introduce new ideas, or just get their pupils more involved. The beginning and finish of a class can both benefit from the inclusion of learning programmes. Students' interest and drive to study can be sparked by these activities, and they can also serve to review, reinforce, and test previously taught material.

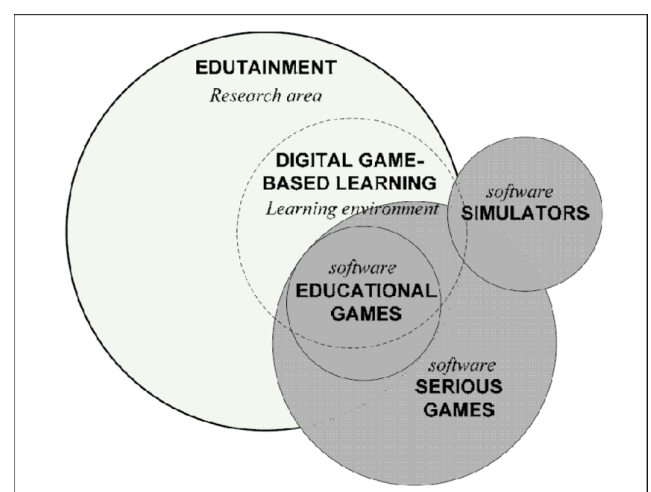


Fig-1: Field expansion in educational gaming

Several aspects of student performance, engagement, and desire for learning are impacted differently by games and simulations. This research does not provide a

comprehensive overview of how these tools might be used in different academic settings since it focuses solely on specific fields. As a result, a teacher's discretion is often required in determining how well interactive exercises like games and simulations fit into the curriculum.

In accordance with the sole focus of this section, the purpose of this paper is to undertake a meta-analysis of scientific research on the educational value of games, and to disclose the types of research and their inferences. There is a clear need to examine how game-based learning has been studied and how the results of such studies can inform practitioners due to the widespread use of educational games. For educational game practitioners, there is a pressing need to not only demonstrate the value and effectiveness of educational games, but also to provide useful input on how to implement educational games in practise. Another goal is to give a general overview of the various types of studies that evaluate educational games and to identify trends in the field of serious games research. Finally, we evaluate whether the results of observational assessments in the field of complex games are linked to the involvement of the assessor as a stakeholder in the design and development process.

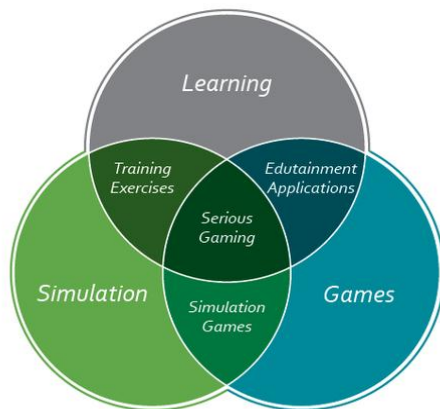


Fig-2: Serious gaming relativity

To confirm the outtakes of what this research contributes towards, results in the form of survey answers are studied and synthesized into the final review of how revolutionary this particular domain could potentially turn out to be.

2. LITERATURE SURVEY

There is a plethora of definitions for computer games, as well as widely accepted broad concepts of what videogames represent. [4] For instance, Salen and Zimmerman outline eight alternative meanings that each emphasize different aspects of the term and arrive at a very simplified definition: "A game is a system in which players engage in an artificial conflict that is specified by rules and that results in a quantifiable outcome,". Particularly restrictive is the constraint on quantifiable outcomes, which is a significant limitation of the definition. It is often beneficial to use more

open characterization, such as the one provided by Prensky, which includes the element rules, goals and objectives, outcomes and feedback, conflict and competition along with opposition and interaction, as well as representation or narrative, in order to better understand the situation. It is also crucial to consider the concept of collaboration when playing games; there are many games that do not place a strong emphasis on competitive features or winning in particular.

Serious games, which we consider to be a collective name, comprise a variety of instructional games as well as games for a variety of other objectives, such as training, recuperation, advertising, and supportive behaviors. Serious games are becoming increasingly popular. [6] According to Zyda, the word "serious games" means "a mental contest that is played with a computer in accordance with specific rules, and that is used to further government or business training, education, health, public policy, and strategic communication objectives through the use of amusement." Although this definition is very wide, its emphasis on amusement can occasionally conflict with what is sold as serious games in the marketplace. The term "serious games" refers to a continuum between games with a purpose and experiencing environments for a purpose, which Marsh describes through an example as: many serious game applications, rather than relying on the game play component, make use of the technology that are normally associated with videogames. These applications, which are referred to as virtual environments and digital media, do not have any of the qualities associated with traditional gaming. Specifically, for the sake of our research, serious games refer to games that involve the player and contribute to the achievement of a defined goal rather than sheer enjoyment. When it comes to serious games, the purpose can be defined either by the user or by the game's designer, which means that a commercial off the shelf (COTS) game that is utilized for purposes other than enjoyment can be called a serious game. In this regard, it is important to note that the use of game and visualization technologies, simulations, and virtual worlds for reasons other than amusement might be included within the scope of this term. While this definition encompasses both digital and non-digital games, it should be noted that the vast majority of references to serious games are, in reality, to digital-based serious games.

[1] A comprehensive overview of studies on computer games is presented by Tobias et al., who assess the evidence regarding the effectiveness of computer games as instructional tools. 95 studies are divided into groups based on their purpose and knowledge claim. The following classifications have been identified:

- The transfer of knowledge, abilities, and attitudes gained from games to real-world work is a major goal.
- Cognitive processes such as visual attention, spatial visualization, and problem solving are affected.

- Improving performance and learning in a variety of topics.
- The application of games in educational circumstances.
- The impact of playing games on students' ability to learn in school.
- Effects on aggression, animosity, and motivation.
- A shift in one's attitude.

Tobias and colleagues conclude that the findings of the studies reviewed indicate that instructional games have potential. However, since they identified a number of areas in which additional research and theoretical advancement are required, these claims are regarded as provisional. "There is significantly more enthusiasm for describing the affordances of games and their motivating characteristics than there is for conducting research to demonstrate that these affordances are being used to attain instructional aims or to resolve problems identified in prior research," Tobias and colleagues conclude[1]. One interpretation of this issue is that there is a desire within the community to produce and evaluate prototypes rather than devoting greater resources to the actual use of the prototypes in educational situations.

Egenfeldt-Nielsen provides an overview of the instructional usage of computer games by studying the fundamental learning theories that underpin these games' development. There is a paucity of understanding about the ramifications of employing games in educational situations, owing to the fact that this particular subject has its own set of issues in terms of techniques, emphasis, and appropriate study questions. When it comes to educational game design, he points out that all of the main learning techniques (philosophy, cognitivism, constructionism, and socio-cultural approaches) have something to offer, and that there are names out there that highlight each of them. As a result, there is no silver bullet, and the world of educational games is not uniform in its approach.

Hays provides an analysis of 48 empirical research publications on the effectiveness of instructional games that were published between 1982 and 2005, and draws the conclusion that empirical studies on the instructional effectiveness of games are scattered and not necessarily methodologically sound. Furthermore, there is no evidence to suggest that games are the most effective instructional tool in all circumstances. This suggests that the educational atmosphere as well as the instructional activities that take place in conjunction with the game are critical.

[12] Vogel and colleagues report a meta-analysis of computer games and simulations for educational purposes. They assert that it is difficult to define the nature of the relationship between games and learning since there is no consensus on which abilities and domains should be considered when analysing the relationship. This is addressed by focusing on studies involving the development

of cognitive abilities or the modification of attitudes. Furthermore, they only include research that gives statistical findings and evaluate the difference between regular classroom instruction and computer gaming or interactive simulation instruction. This demonstrates the wide range of possibilities in the field.

[10] In Ke's opinion, empirical research on instructional games is scattered. Ke also points out that much of the evaluation of games has been anecdotal, descriptive, or judgemental in nature, citing Dempsey et al. as sources of information. Ke gives an examination of the methodologies that have been employed and the outcomes of the empirical research that has been carried out. It is noteworthy that no consideration is given to the evaluator's independence or whether the evaluator has a shareholder in the development of the game.

3. PROBLEM STATEMENT

The work proposed in this paper addresses the following concerns:

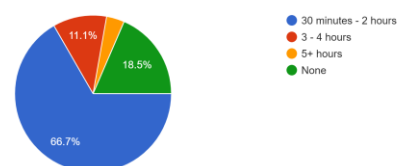
- i) To identify substantial pieces of putting forward a user-efficient edutainment product.
- ii) To categorize and look over the variety of issues faced by developers in selecting the ideal mode of presenting the product of interest.
- iii) To infer suppositions regarding product likeability and provide a logical outlook on the existence of potential growth in the edutainment domain.

4. SURVEY ANALYSIS

After reviewing the critical inferences along with the supportive outlooks deciphered through the evaluations, we developed a conceptual survey that helps understand the variety of opinions that the target users put forward through the involvement of resourceful questions entailing specific categorization in reference to the enticement and efficiency factors. The following are screenshots of the results obtained from a massive number of interested users (112 responses, specifically):

1)

How many minutes/hours of your day would you spend immersed into the virtual world of gaming?



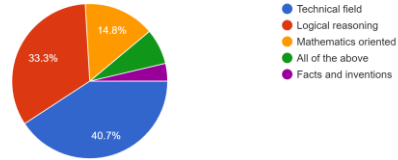
2)

In terms of programming knowledge, which of these options do you think you'd classify yourself as?
27 responses



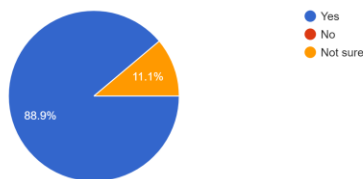
7)

Which of these specific areas of interest do you believe would be best suited for an educational game?



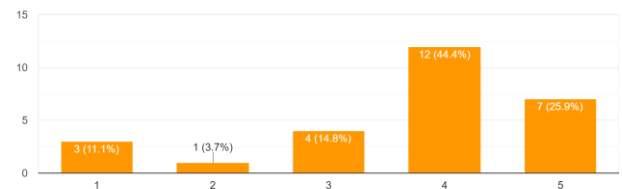
3)

Do you believe that educational games for the modern generation are essential?



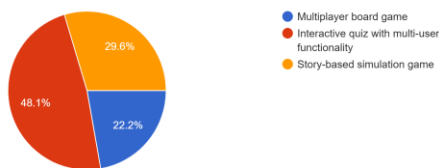
8)

On a scale of 1 to 5, how likely are you to buy/download a game with a goal of educating users in a competitive manner of operation?



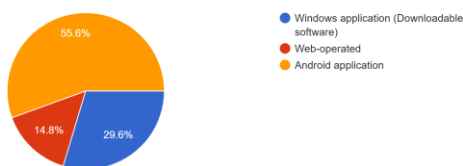
4)

Which of these options would you suggest is an admissible concept to work around an educational game?



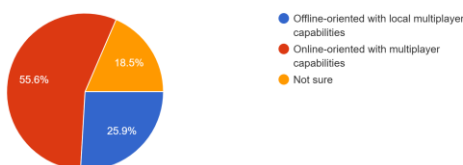
5)

Select one of the following platforms which would be ideal for the topic of interest (Educational game)



6)

Let us know which of these options you'd prefer for engaging yourself in an educational game



5. CONCLUSION

The survey formulated several differences amongst the variety of survey takers as clearly observed in the previous section. As indicated in the responses produced over time, the concerned public opinion rows towards the ideology of incorporating the use of educational games to help build a community of technology-driven learners that could potentially develop newer concepts of perceptions into concerned topics of interest. Devising interactivity capabilities into the developed product catches the eye of the modern generation in terms of fulfilling the need of cognitive and healthy psychological development concerns. Basing the system in a virtual field of a variety of enthusiastic players turned more heads as opposed to solo riding the program. As a matter of the category of specific educational fields of interest that could potentially be the main topic of interest for the games, the technical field caught a significant amount of attention as compared to the likes of other fields, showcasing a sense of interest from the users towards the virtual world even further. As a result of the above inferences, we could consider that online educational games portray a high rate of curiosity and attention. The users would most definitely be open to trying out possible ventures into developing educational games. It might not be possible to push through this domain with high quality products due to cost and business concerns. However, basic, and inexpensive resources, can be used to build diverse instructional games for concept-rich topics that students find challenging to learn. Students' motivation to learn and interpersonal skills can both be improved in this way. Future students can also benefit from the games created.

REFERENCES

- [1] S. Tobias, J. D. Fletcher, D. Y. Dai, and A. P. Wind, 'Review of research on computer games', *Computer games and instruction*, pp. 127–222, 2011.
- [2] J. J. Vogel, D. S. Vogel, J. Cannon-Bowers, C. A. Bowers, K. Muse, and M. Wright, 'Computer gaming and interactive simulations for learning: A meta-analysis', *Journal of Educational Computing Research*, vol. 34, no. 3, pp. 229–243, 2006.
- [3] J. Kirriemuir and A. McFarlane, 'Literature review in games and learning', 2004.
- [4] K. Salen and E. Zimmerman, *Rules of play: Game design fundamentals*. MIT press, 2003.
- [5] M. Prensky, 'Digital natives, digital immigrants Part 1', *On the horizon*, vol. 9, no. 5, pp. 1–6, 2001.
- [6] M. Zyda, 'From visual simulation to virtual reality to games', *Computer*, vol. 38, no. 9, pp. 25–32, 2005.
- [7] T. Marsh, 'Serious games continuum: Between games for purpose and experiential environments for purpose', *Entertainment Computing*, vol. 2, no. 2, pp. 61–68, 2011.
- [8] R. T. Hays, 'The effectiveness of instructional games: A literature review and discussion', *DTIC Document*, 2005.
- [9] S. Egenfeldt-Nielsen, 'Overview of research on the educational use of video games', *Digital kompetanse*, vol. 1, no. 3, pp. 184–213, 2006.
- [10] F. Ke, 'A qualitative meta-analysis of computer games as learning tools', *Handbook of research on effective electronic gaming in education*, vol. 1, pp. 1–32, 2009.
- [11] J. V. Dempsey, K. Rasmussen, and B. Lucassen, 'Instructional gaming', *Implications for instructional technology.*, presented at the Annual Meeting of the Association for Educational Communications and Technology, Nashville, TN, 1996.
- [12] S. Kim and M. Chang, 'Computer games for the math achievement of diverse students', *Educational Technology & Society*, vol. 13, no. 3, pp. 224–232, 2010.