IARJSET

ISSN (Online) 2393-8021
ISSN (Print) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

International Conference on English Language and Literature in the Pedagogical Perspective: Embracing the Landscape Shift through Innovative Practices - ICELLP 2K22

Narula Institute of Technology, Agarpara, Kolkata, India

Vol. 9, Special Issue 3, May 2022

Educational games as an effective learningmethod

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Abstract: Education is an inevitable part of everyone's life. Now a days instead of traditional ways of learning, there are lots of innovative methods that has been incorporated in teaching methodologies by teachers across the world. However, 'The zeal to learn' is the main tool of every learner to achieve their goals in life. So, in this new era of digital learning, everyoneis behind that interest to learn quickly and effectively. Enticing the ideas of quick and effective learning introduction of educational games as a different approach in the teaching methodology has been introduced. Even the introduction of new technologies in the world, compelling learners to find out some different methods of learning. This research paper reveals about learning by the help of educational games, it's influence and uses on the learning process. This paper also gives an overview about some serious games and considers which skills and abilities can be achieved with it.

Focus of this study: This study investigated the following research questions:

1. Do instructional games augment learning?

2. How game mechanics impacts learners learning pattern and mindset?

3. How 'gamification' or game-based learning can be considered as a better option than traditional classroom- based education?

Keywords: educational games; games for learning; game-based learning;

I. INTRODUCTION

Today's learners are digital natives. The external influence of gaming. Each game has different effects on human brain. But some common and key effects of games can be used in pedagogical prospect. Serious games are stimulations of real events or processes designed to solve a problem these games are effective teachingand training tools for students of all ages because they are highly motivating and convey concepts and facts from many subjects very efficiently. Serious games offer a rich field for risk free active engagement with serious intellectual and social problems. Other educational games such as Word Scramble, Scrabble, Sudoku etc. can improve different knowledge levels and skills of learners.

More over this kind of educational game-based learning is a sign of creativity toadopt the new strategy to enrich students' learning experience. In particular, learners can use these educational games forexperimental learning to develop their decision making and problem-solving skills in a dynamic learning environment. Additionally educational game-based learning gives instant feedback or results to the learners instead of receiving delayed feedback from traditional assessment method such as test and examination. Also, some level of pedagogical games can help to reduce constraints such as time and place, as wearable devices can allow students to study and learn anytime and anywhere. These easy-to-use tools can make difficult topics easier to understand and memorise. As games are challenge oriented, so students are going to develop challenge taking and self-learning capabilities.

This kind of educational method help auto-evaluation of the student in every step. By analysing different learning curves of various students, optimal learning techniques can be determined for different students and rest of the learning path can be decidedon the instance accordingly. Interactive and conversational games will help learner to improve communication skills. Word games like Scrabble can assist to improve stock of words while mind games and puzzles develops creative thinking.Mathematical games such as Sudoku helps a person build strong mathematical and logical concepts as the game is entirelybased on logic theory and the placement of numbers in a particular format or combination. Even if the students' attentionand concentration can increase with age, it is important that the students' motivation to learn remains at high level. The following data of a survey (Fig. 1), which was conducted on August 2020 by Irene Picton, Christina Clark and Tim Judge, showsthat, typical method of education results lack of attention in student, where they prefer playing video games over readingbooks.

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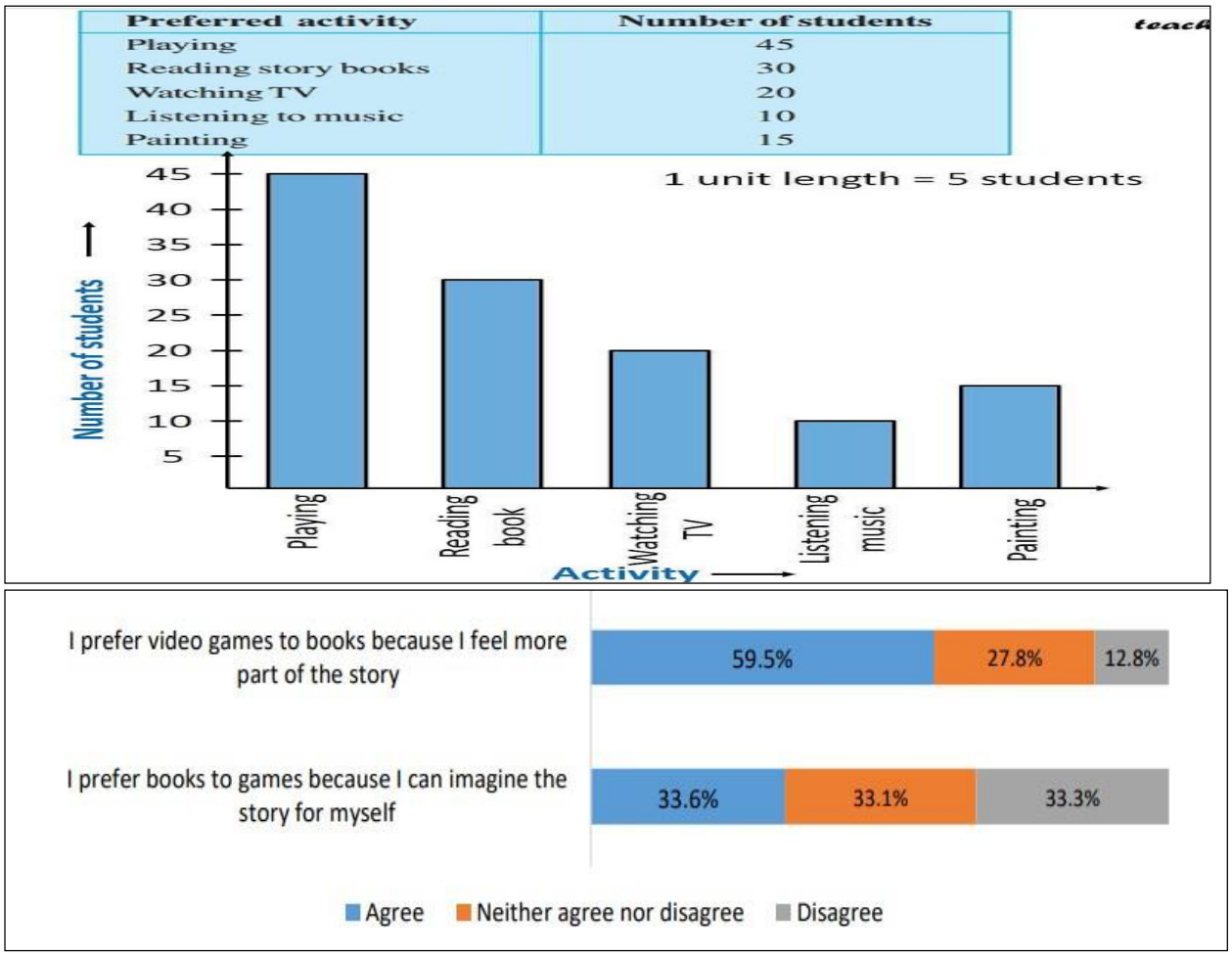

Fig. 1 No of students vs activity preference

Another survey shows that, students prefer playing rather reading books. Indepth and practical impact of game of basededucation in different serctors are mentioned below.

Linguistics: Games like 'Word Scramble' which can help to improve 'Word' recalling capabilities by 67inimizing67 learnerto construck a words with a given starting alphabet. A game called **'Scrabble'** where player have to guess words by seeing these kind of games helps build strong dictionary and helps to explore unknown words. There are several graphicgames for juniors, where they learn new words, grammer, preposition etc. by relating with picture. Vocabulary and pronunciation challenges improves speaking skills effortlessly.

Mathematics: Mathematics is a great field to implement game based learning. There are several online and offline gameswhich teaches student to do calculation in faster and efficient way. Geometrical games helps students to 67inimizin differentgeometric shapes and it makes 3D geometry and easy topic.

Statistics: Bar Graph and Pi-Charts can be 67inimizing just by few moseclicks and keystrokes, using modern online statistical games.

Geography: Mandatorily game need not to be a digital one. Board games like 'Indian Safari Junior' can help students toexplore about geographical mapping of different locations.

History: Specific computer games helps to 67inimizin un-witnessed past or history, by interacting with the virtual world learner can explore different historic places without spending and stepping out. Visual storytelling historic games helps learner to memories events efficiently.

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Science: In this vast field, games are being integrated everywhere for ease of understanding of different concepts. Different virtual-lab and simulation games can be used to teach complex experiments by 68inimizing risk factor like physical harm. Different space exploration games help learners to explore numerous cosmos articles and topics related to astrophysics.

Logical: Puzzels and the best example of logical games. Logical games elevate critical thinking and reasoning skills. Game such as Chess, intensify strategic and expeditious thinking.

General Knowledge: Trivia games plays an important role in education for all age learners. This quiz based games increase general knowledge and tricky questions improves IQ.

Fitness: Fitness is the part of physical education.
That is why, outdoor games cannot be neglected as educational game as it helps to

This paper contacting deliberation about **"Death On The Nile"**, a game based on a novel of Agatha Christie, and it's impactful relation with education. It is a crime investigation game, to solve a confined mystery, the player have to examine different evidence to uncover hidden clues, which will boost concentration power and active thinking. In one level, player have to question suspects to uncover more clue, by doing good communication skills and vocabulary will be made. Throughout the storyline payer will explore new words which can be a great essence for communication skill.While moving in the flow, player will flourish great imagination skill which will not only help to over levels in the gamebut also will make a great impact on real life challenges. This game can be played in groups, which will improve team working capabilities. "Death on the Nile" a seek and find game with good story-line help to keep memory sharp. Overallit is a great game for 'Explorative Learning'.

In this period of financial, economic, and social crisis, citizens must be ready to face the challenges of the future and individual values of each citizen must be linked to those of society as a whole. Educational games are the perfect tool toachieve and convey the goals and values attractively and efficiently.

II. GAME MECHANICS AND IMPACTS ON EDUCATION

Game mechanics are the rules that govern and guide the player's actions, as well as the game's response to them. A game'smechanics thus effectively specifies how the game will work for the people who play it. There are several common and key features of games which can be used effective teaching and learning.
Mechanisms:

A. Rewards

Points: Based on learner's (players) performance for a particular level, points are delivered instantly. Thishelps for instant assessment of the learner.
Badges: After overcoming a certain level of hurdle, learner receives a badge. It makes learner moreconfident about themselves and keep them motivated for facing upcoming challenges.

A. Loyalty

Exclusive Rewards: By completing certain assignments, learner obtain exclusive rewards, such ascertificates, special levels for enhancing their knowledge.

B. Status

Leaderboards: Comparing ranks of same categoric learners', one can self-assess themselves which makesthem competitive thinker and it also helps teachers for having better understanding about amplitude of different learners.

Points: Points obtained by the learner for a particular level, helps teachers to know efficiency anddeficiency of the learner for a particular level.
Badges: Comparison of obtained badges among same category of learners can be used to analyse learner'sunderstanding about the certain level.

C. Purpose

Every level is made of a certain purpose, either for teaching or assessment.

D. Connections

Loyalties of a student helps to build connection with other same category students, which ishelpful for building team and strategic works.

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Fig. 2 Games and impact on education

III. TYPES OF GAMES IN EDUCATION

Based on the mode of a game, it can be categorised into two sectors: Virtual Games and real Games
According to the nature of the games, it can also be categorised into multiple sectors. In the following section, impactsof different sectors of games in pedagogy has been discussed.
Simulation Games: Simulation games are the serious games. Learner can learn complex and risky topics,without having risk of physical harm.

Example 1: Virtual laboratory games helps learners to perform and build understanding for different riskyexperiments without exposing physical body to the danger.
Example 2: Circuit Simulator can be used for experiments with high voltage circuits, where minorexperimental fault can lead to severe harm.

Combat Games: Tackling multiple targets at a time can help to develop good 'Hand-Eye' coordination and onsciousness of surroundings, increases focus, which helps in real life.

Exploration Games: Exploration and detective games, sharpens mind, develops imagination power,improves critical thinking capabilities and make learners more focused.

Board Games: In general board games are real multiplayer games. Multiplayer games improve interactionand communication skills. Different board games having different impacts on pedagogy

Example 1: Chess, a board game which develop perspective, improve memory, boost planning skills, increases self-awareness.
Example 2: Scrabble, a game where player have to form different meaningful words. It teaches vocabulary, strategy, encourages social cooperation and bonding while playing with opponent.

Auditory games: Verbal or auditory games build good instant thinking skill, which is often helpful real life critical scenarios.

Example 1: Antakshari, it is a spoken parlor game, where player have to think about a song starting with the ending alphabet of song sung by the last player. This multi-player game increases memory recalling capabilities, boost communication skills and develops thinking skills.

Puzzles: Puzzle are made for making memory and observation sharp.

Example 1: Jigsaw puzzle, a great mental exercise tool which improve visual-spatial reasoning, improve short-term memory, IQ and problem-solving abilities.
Example 2: Rubik's cube, to solve it player need to learn different algorithms which improves memory,makes conscious about their steps while doing different moves to solve the cube, keeps mind active and helps to stay focused while being patient. Solving cube regularly helps to develop better reflex andmuscle memory.

IV. GAMES IN DIFFERENT DOMAINS OF EDUCATION

Literature: Literature Games and Vocabulary Games are fun ways to expand knowledge of the English language, There are several virtual and classroom games which are used to improve reading and listening skill. Special audio-visual games help child to learn in interactive, fun and fast way.

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Maths: While game is combined with maths, complex equations are visually simplified. Different softwareteaches learners maths in an easy and efficient way. Games such as 'Sudoku' boost logical thinking and pattern building capabilities. Good practice of some games can make help learner to do calculations quickerand smoother.

Science: Virtual lab and simulation software are the fun, safe and interesting way to gain in-depth knowledge about topic and perform experiments. Curious minds can tweak any experimental thing to learnabout a new outcome, while being in a safe zone.

History: In general, most learner consider 'History' as a boring subject. But visual storytelling and fun game such as 'The Oregon Trail', 'Civilization VI', 'Victoria II' etc. makes history interesting for learners.

Geography: Without traveling physically some virtual games can take one anywhere. It helps to learn about different places and the cultures of the residents. Classroom games such as 'Map finding' motivates user toexplore different places in a map, which escalate memory power and can make one fast thinker.

Reasoning: Logical reasoning skills are essential for our daily life so it is important to put them in practicein order to keep your mind healthy and active. Good practice of virtual reasoning games keeps mind sharp,some game teaches different and interesting shortcuts for solving reasoning problems. Several mobile application based games offers different logical and reasoning challenges with instant solutions.

General Knowledge: Online trivia or quiz games boost IQ, improve knowledge better, keep learner updated.

V. BRIEF PEDAGOGICAL IMPACT ANALYSIS

Based on British writer Agatha Christie's detective fiction novel 'Death on the Nile', a game has been developed, whichhaving a considerable amount of impact on player in prospect of pedagogy.

A crime investigation game, to solve a confined myestrey, death of a rich heiress, the player have to examine different evidence to uncover hidden clues as detective Hercule Poirot. There are 12 challenging investigation levels and 24 rooms with hidden clues. These challenging levels sharpens critical thinking and teaches about different real lifechallenges and make learner bold to face them. While finding hidden clues, focus and concentration power increases and with good imagination skills clues can be discovered while improving observation power. Interaction with 20 unique characters, each with their own motives, makes player learn about human psychology and help to decode thoughts of people. The blend of mystery and suspense makes brain patient. The game can be played in groups while parallelly upgrading team work capacities and mutual understanding.

VI. PSYCHOLOGICAL IMPACT

Virtual pedagogical games keep learners entertained by blending fantasy with education, whereas *Real pedagogical games* develop communication skills and creativity. Playing games, effect different hormones secretion in body, which improves mental and emotional stability. Winning a game makes player happy, which motivates to do self-learning to face unknown upcoming challenges.

VII. CONCLUSION

Fusion of games and technology, can be used for smart, efficient and adaptive learning. Integration of Artificial intelligence with educational games, can be used for obtaining learning curve based on learners' performance. As everybody having different learning patterns, obtained learning curve will help for effective curriculum planning for a particular student for best possible learning experience.

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