

An Interactive Gamified Platform to Foster Children's Rights, Legal Literacy and Ethical Awareness

Dr. Gulbakshee Dharmale¹, Anvita Bamboriya², Gayatri Kokare³ and Simran Kamble⁴

¹⁻⁴ Pimpri Chinchwad College of Engineering, Information Technology, Pune, India

Email: gul12dharmale@gmail.com, anvitabamboriya@gmail.com, gayatrilkokare@gmail.com, kamblesim@gmail.com

Abstract—To cultivate a healthy and sensible society; legal literacy and ethical awareness are the crucial components. To justify and address these components, a collaborative gamified platform has been conceptualized. The project aims to develop an engaging and interactive gaming platform to educate children about their rights while giving emphasis on ethics as well. The platform is designed for preadolescences, to be approachable and inclusive, surpassing demographic differences. This innovative platform provides an enjoyable educational experience that will empower children with a precise understanding of their rights and ethical considerations. The game prototype consists of different scenarios and modules where children will be asked to play games and achieve scores based on their understanding of different situations. The types of games conceptualized are educational quizzes, storytelling scenarios and also games that will enhance the decision-making skills of children. The platform is designed and developed using Unity gaming tool to ensure user-friendliness, learning outcomes, and gaming experience. Through this platform children will be able to learn and grow in society by having a sense of understanding between the good and bad. By fostering a youth that is socially aware and knowledgeable, the games aspire to contribute positively to the well-being of children and society

Index Terms— Gaming platform, Ethics, Rights, Children, Unity.

I. INTRODUCTION

The necessity of educating children about their rights, legal literacy, and ethical awareness is critical in today's interconnected world. Cultivating young minds with the knowledge and understanding of basic human rights and ethical obligations fosters a strong society. To fulfil this need, three attractive and engaging games have been designed. The games align with domains like education, child literacy, and technology. By gamification techniques and interactive storytelling, this platform aims to bridge the gap between legal concepts, ethical reasoning, and the understanding of children's rights among younger audiences.

Children can stand up for their as well as others rights and become little activists only if they are first aware of them [1]. Even though there are several laws enforced to safeguard child's rights, the children itself are not aware of them. This unawareness leaves them to become a culprit of discrimination, abuse, and unprotected situations. Majority of children around the world easily miss out on this type of education. From past a few decades, ethics and morality have been the foundation to shaped the value, culture, and merit in the society. It is like an obligation to introduce ethics and morality to the children as soon as possible. Based on their family, culture, and society; child development at an early age can be occupied by introducing ethics and morality [2].

All these facts have generated a motivation to design games that will help children become aware of their rights and ethics, increasing their legal literacy. The use of technology, like computer games, to enhance students' learning outcomes in the classroom is a prime topic of literature review in today's times [3]. Digital technology serves as an innovative method to engage children into learning. The games can prove to provide an enhanced learning experience while keeping the fun element alive. Playing and learning elevates the grasping skills of a child, helping them to understand their surroundings at a young age, resulting in bright future generations. The gamification and educational content in the games promotes the problem-solving skills, encouraging children to actively participate in the societal issues.

Another positive impact of fostering rights and ethics through digital games is self-development of the child. Ethical game will help the child to make decisions between good and bad ethics and applying them in the real world, promoting self-growth and improvement. Education about rights will make the child more aware about its surroundings and develop confidence to stand against the bad. Children will develop a clear sense of understanding and their role in the society. Immersing children into this gamified education will lay a solid foundation of personality development as well as a bright and empowered youth.

II. BACKGROUND

Serious games can be a way to fill the gap of human rights education that these children are facing and help them develop by time, by considering the important issues and challenges [4]. The foundation of this project is rooted in the fundamental principles of children's rights, legal literacy, and ethical awareness. Various global child rights committees state that every child should have the entitlements and protections as articulated in international documents [5]. Education, healthcare, safety, protection, child labor, child marriage and many more such topics are necessary for children to understand and be aware of. The roots of these games are driven from child development theories and technology. Educational psychology states that effective learning and knowledge gain in younger audiences comes from effective and interactive learning. Utilizing the gamification elements, the game design can be made attentive and engaging. For self-learning, training, and edutainment, serious games are considered as very important tool. It helps to improve the grasping skills of children in an enjoyable and fun manner [6]. Piaget's Theory states that construction of various thought processes is cultivated through cognitive development, which includes memorizing, problem solving and decision making, in different stages of life [7]. Play can contribute to cognitive development in a number of ways. Children can think about the past, present and future by developing their imagination and memory, which is essential. This can be achieved through digital games which is a multimodal means of information that helps children to understand the world by coding and decoding a variety of images, symbols, sounds and words [8]. The blend of these theories constructs the idea of developing serious games for children. The games conceptualized will guide children to make informed decisions and also serve the society for the good.

III. LITERATURE REVIEW

The preconditions for living in a democracy, i.e. the foundation of knowledge, skills and values is built in childhood [9]. There are n number of rights available to the children, but not all children are getting their rights [10]. 50% of Indian children who are of 6-18 years of age do not go to school. According to a study sample (N = 17.369), very few children were aware of their rights and which of them they had [9]. Many researches have highlighted that digital games influence minds of young children at a very faster pace than other traditional methods. Gaining an experiential understanding of real-world issues through play is a result of serious games, persuasive games and news games [11].

Digital games have gained importance as an effective tool for undertaking knowledge build about serious issues like health, legal education, protection for children. Methodologies such as User-Centered Design (UCD) and MEEGA+ evaluation techniques, are adopted by researchers in creating health games to promote healthy eating habits among children to create an awareness on diabetes [6]. Moreover, utilizing participatory design to introduce educational interventions in preschool to educated about legal concepts has also been adopted [8]. Teaching legal concepts through android games, enhances knowledge grasp and decision-making skills of children.

Serious game design has also emerged as a valuable approach, incorporating frameworks such as the conceptual designs based on specific parameters also know as "Six Facets" and utilizing game designs according to Adam's ruleset to develop engaging and educational games [2]. Through expert consultation and iterative development processes, serious games have been created to address various topics, including law-related tests and literacy

acquisition [12]. A literacy game named 'Navigo' is developed to supporting the need of primary school children's reading skills and children with dyslexia [13].

Learning systems such as the 'Kahoot' gaming system has been prototyped to cultivate problem-solving strategies among children, by using user-centered design principles [14]. The 'Rights Hero' game, developed for migrant children, demonstrates the potential to increase human rights knowledge and positive decision-making [4]. "Law in Children's Life" is an android game initiative featuring multiple scenarios where children are asked to apply their legal competence to make informed decisions and solve different questions by examining the given scenarios [15].

Different studies show the effectiveness of educational games can be measured in terms of user-friendliness, game experience, and learning outcomes [2]. A Java open-source program based on a TV show that teaches children numeracy was evaluated and revealed that the feature-enriched game (FEG) is more effective and attractive compared to the feature-devoid game (FDG), that indicated its potential to inculcate the game in school teaching and syllabus [3]. The literature survey gives a brief understanding on different types of methods and practices to educate children and importance of teaching various issues from an early age, which assists our area of work.

IV. METHODOLOGY

The literature review provided knowledge about different methodologies that are used in implementing a game based software. Out of the reviewed methods, "Six Facets" methodology can be applied in the implementation process. The type of game that will be created will fall in a serious game category.

A. Serious Games

Games that conquer useful objectives like learning and training along with the fun factor, are called serious games, have gained quite an attention of the gaming industry in the world [6]. Serious games promote learning while having fun. Entertainment, engagement and immersive experience is the power of serious games. Education strategies, knowledge and skills, and game elements are combined in serious games teaching specific concepts and attitudes. Utilizing the entertainment and engagement components, they are designed to solve different real-world challenges and accomplish rewards. Serious games have two main areas of expertise, i.e. the developers design and teachers' design. This can prove to be a problem that if the game is designed only by developers' point of view, then the game might be very entertaining but may lack knowledge factor. Similarly, if teachers and trainers design the game, the game may be educationally very effective, but may lack the potential to engage players. To address this concern "Six Facets" method is utilized.

B. Six Facets of Game Design

The "Six Facets" are guidelines that help developers to design Serious games that consider the primary purpose of entertainment along with education. The Six Facets that will be considered in this project will be – Intellectual Objectives, Simulation of Domain, Interactions with the Simulation, Real World Problems, Decorum or High Score, Conditions [2]. Pedagogical Objectives define the desired learning outcomes to be incorporated in the game. The objectives defined help to create the simulation process of the game which includes the types of games to be designed. Interactions in simulation are crucial for players active participation. Appropriate user-friendly UI designs are supposed to be created. Problems and Progression specify the inclusion of challenges and problems in daily life.

TABLE I. SIX FACETS OF GAME DESIGN

Sr. No.	Six Facets	Design Patterns
1.	Intellectual Objectives	Inserting knowledge model of the domain child rights, ethics and literacy.
2.	Domain Simulation	Simulation of the domain.
3.	Interactions	UI design interactivity for children
4.	Problems	Real life problems and scenarios to be depicted with game mechanics.
5.	Decorum	High Score.
6.	Conditions	Single Player Game.

C. Design Thinking Steps

Design thinking is a process that is useful in guiding the design of gaming application. It comprises of five steps: empathize, define, ideate, prototype, and test [14].

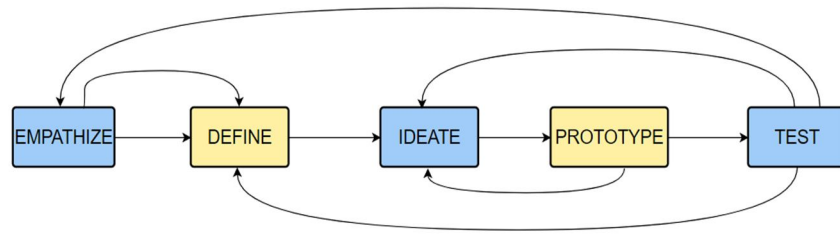


Figure 1. Design Thinking Steps

Empathize: This initial step helps to understand the problem that we are working on. We will have to take into consideration the extent to which children are aware of their rights and ethics. Research on collecting data regarding different types of rights and ethics will be implemented in this phase.

Define: Problem statement based on the findings from the empathize phase is defined.

Ideate: Ideas based on the problem statement will be formulated. The idea of this project is to create a gaming platform through which children can engage in the learning process of their legal rights, literacy and ethics. Story telling scenarios, picture quizzes, adventure games are proposed to be designed.

Prototype: The prototype will include the representation of our solution. A gamified platform using unity gaming tool will be designed in this phase.

Test: Testing will be conducted to evaluate the software developed on the basis of parameters like player experience, user-friendliness and learning outcomes. MEEGA+ is a educational game evaluation model that evaluates these three parameters from the viewpoint of players. Also, feedbacks from the players will also be taken to evaluate the software.

V. SYSTEM DESIGN

Fig. 2 shows the architecture of “Cognitive Arcade”- a system which consists of three games developed, as discussed in the next section. “Cognitive Arcade” is a spectrum of games that provide learning and problem solving outcomes for children. Each game consists of different scene-plays. Starting with the Main Menu module, the game follows the next module where different levels or categories are present, based on the game being played. “Virtue Rain” game consists of 12 levels which is discussed in the Implementation section of the paper. On the contrary, “Words Spy” and “Empower Run” have categories listing different rights and ethics in the game. The flow goes from selection of a particular level or category, to simulation of game. After playing a certain level, if the player wishes to play again then he/she can or else end the game. The high score of the player is restored with the help of ‘PlayPrefs’ function, which acts as a type of database.

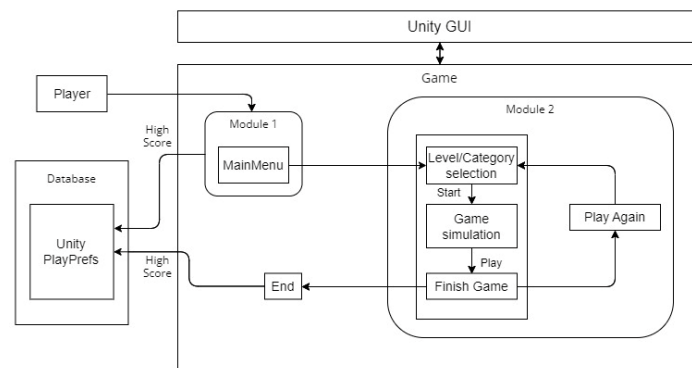


Figure 2. System Design

VI. SYSTEM WORKING

The games are developed using the Unity Engine gaming tool. Inside this tool, all the scenes of the games have been designed. The entire project contains different assets each having their independent purpose. The graphics and images in the game are called as sprites. These sprites are animated using the animator window in unity. The working and flow of the game is handled using scripts. Scripts contain the code of the game related to each scene.

The entire scripting of the games is programmed using the C# language. The scripting is done in the code editor and is attached to the scenes as required to make the game function as desired. Spawning is the main feature in these games. Spawning means making a certain game object appear continuously at a certain time interval. The obstacles in the games appear continuously due to the spawning feature. All the text and image content in the game is a part of Canvas UI which scales the images and text as per the screen size. This tool has offered various features and technicalities making the development process faster and feasible. In the further sub-headings, each game content has been discussed in detail.

A. Virtue Rain

'Virtue Rain' is an ethical game designed for children to make them aware of their ethical obligations and manners. Fig. 3 shows 12 levels which are defined in the game. Each level has one ethic that the player will learn. Fig. 4 shows description of first level i.e. 'Brushing teeth twice a day' which is a basic everyday habit. As the level increases the types of ethics also advances. The player will have to collect the good ethics as shown in Fig. 4 and avoid the bad ethics. Fig. 5 shows the good ethics to be collected by moving the character in the game left and right across the screen. On collecting each good ethic, the score will increment by 4 and if a bad ethic is collected the game will stop and the player will have to start again. After achieving the level target, next level will be unlocked. The ethics that the player will learn in the next levels are: Exercise every day, Eat healthy food, Take a bath daily, Respect elders, Wash hands before eating, Sharing is caring, Honesty, Treating everyone equally, Be polite, Saying thank-you and sorry. 'Virtue Rain' will inculcate ethics in children from a very young age and teach them the difference between good and bad behaviour.

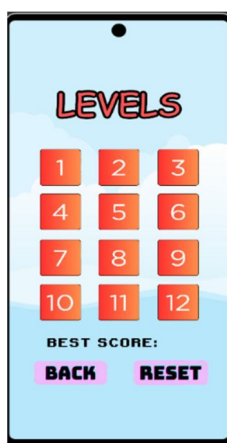


Figure 3. Game Levels

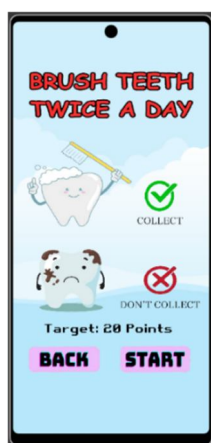


Figure 4. Level 1

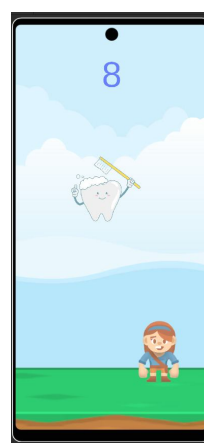


Figure 5. Level 1 Game Scene

B. Words Spy

'Words Spy' is a game developed to make children aware of different words that will help them to learn their rights and ethics. Fig. 6 shows the first scene which has a main menu where you have an option to either play or exit. After hitting the play button the player will be directed to the category menu which has two categories, rights and ethics. In each category the player needs to solve crossword puzzles in a given time frame. Fig. 8 shows the first level of the game which has a 5x5 matrix where the player will have to find the words mentioned below in 60 seconds. After completion of first level, next level will have 7x7 matrix with longer words to be found in 120 seconds.

C. Empower Run

'Empower Run' is a 2D game developed, solely dedicated to spread awareness among children regarding their rights in this world. Fig. 9 sheds light on five basic rights that each child should be aware of. The rights addressed in this game are Right to Education, Right to Healthcare, Child Marriage, Right to Safe Environment, Child Labor.

The player can select any right that he/she wishes to learn. With each right the player will have to play a game which consists of a character that runs endlessly overcoming different hurdles. The player will also collect points to beat its high score. Fig. 10 shows the game scene of Right to Education and Right to Safety. The game encourages the player to cross the hurdles along with understanding the importance of education.

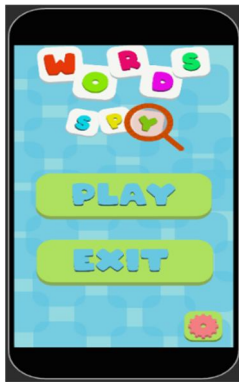


Figure 6. Menu

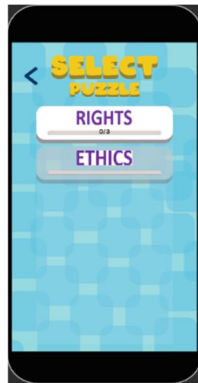


Figure 7. Categories



Figure 8. Level 1

Each game scene also displays a helpline number displayed at the bottom of the screen which will be helpful to those in need.

‘Empower Run’ aspires to create a foundation of an aware generation, empowering young minds to live their lives in a legally correct manner.



Figure 9. Rights taught in Empower Run

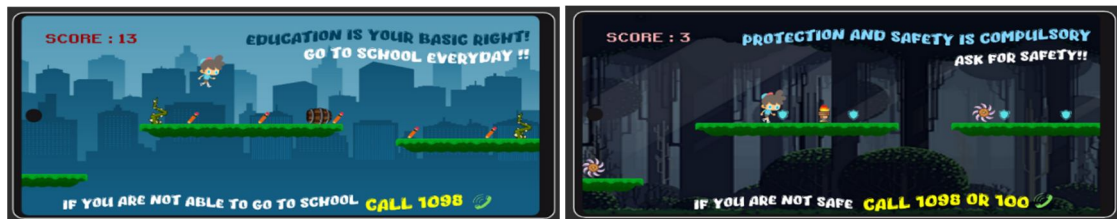


Figure 10. Game Scene of Right to Education and Safety

VII. RESULT AND ANALYSIS

“Virtue Rain”, “Words Spy” and “Empower Run” acknowledge an interesting approach to the educational gaming system. According to literature survey, there are some methodologies and techniques implemented that are useful to introduce ethics and morality to children. The survey also mentions interventions of legal education in basic curriculum. However, there are as such not many or very few existing systems/games that give direct education about rights and ethics to children. Either there are animated videos or digital sessions that provide information on these topics which prove to be not that much engaging for children. Our system has introduced games that motivates children to think and learn about their existing rights as a child and take action in unpleasant situations. This system can create an awareness and understanding about legal and civic education among children through interesting games. The basic knowledge of right to learn, right to a safe environment, right to healthcare is inculcated in children with gameplay through the “Empower Run” and “Words Spy” game. “Virtue Rain” and “Words Spy” help children in learning ethical values in a fun and enjoyable approach. Additionally, feedback from users will help in further maintenance and upgradation of our system.

VIII. CONCLUSION AND FUTURE WORK

The next phase of our work will comprise of evaluation of these games based on user feedback and model evaluation. It will involve gathering insights from users to understand the player experience and usability. This

evaluation process will prove to scale these games in the future for a bigger scope. Expanding the reach of the games will leverage the potential to instil ethical values and empower young minds towards bright future. The games ‘Virtue Rain’, ‘Words Spy’, and ‘Empower Run’ can serve different levels of advancements based on the age groups. The games can also help the children who are in need of assistance by using the helpline numbers provided. In summary, the creation of these three games holds potential for fostering young and safe generations and create a positive impact in the society.

REFERENCES

- [1] “Right Runner Game: Teaching Kids to Stand Up for Their Rights - Global Shakers.” Accessed: Mar. 12, 2024. [Online]. Available: <https://globalshakers.com/right-runner-game-teaching-kids-to-stand-up-for-their-rights/>
- [2] D. Bagus, K. Setiawan, P. Arisaputra, J. Harefa, and A. Chowanda, “Designing Serious Games to Teach Ethics to Young Children,” in *Procedia Computer Science*, Elsevier B.V., 2021, pp. 813–820. doi: 10.1016/j.procs.2021.01.069.
- [3] K. Nand, N. Baghaei, J. Casey, B. Barmada, F. Mehdipour, and H.-N. Liang, “Engaging children with educational content via Gamification,” *Smart Learning Environments*, vol. 6, no. 1, Dec. 2019, doi: 10.1186/s40561-019-0085-2.
- [4] M. Dima, A. Xanthaki, T. Deniozou, and C. Luoma, “The Rights Hero-Serious Games for Human Rights Education and Integration of Migrant and Refugee Children in Europe.”
- [5] “Convention on the Rights of the Child.”
- [6] A. M. Moosa, N. Al-Maadeed, M. Saleh, S. A. Al-Maadeed, and J. M. Aljaam, “Designing a Mobile Serious Game for Raising Awareness of Diabetic Children,” *IEEE Access*, vol. 8, pp. 222876–222889, 2020, doi: 10.1109/ACCESS.2020.3043840.
- [7] S. Ahmad, M. Phil, and M. Malik, “Journal of Education and Practice www.iiste.org ISSN,” Online, 2016. [Online]. Available: www.iiste.org
- [8] T. Sakka and D. Gouscos, “Children’s Rights Education via Game-based Activities: An Intervention in Kindergarten,” *International Journal of Serious Games*, vol. 10, no. 1, pp. 53–79, Mar. 2023, doi: 10.17083/ijsg.v10i1.546.
- [9] P. K. af Ursin and L. Haanpää, “A Comparative Study on Children’s Rights Awareness in 16 Countries,” *Child Indic Res*, vol. 11, no. 5, pp. 1425–1443, Oct. 2018, doi: 10.1007/s12187-017-9508-1.
- [10] A. Prakash, “CHILD RIGHTS AND THEIR PROBLEMS,” *ISSUE 1 Journal of Legal Research and Juridical Sciences*, vol. 2, [Online]. Available: www.jlrjs.com
- [11] C. Swain, “Situated Play, Proceedings of DiGRA 2007 Conference Designing Games to Effect Social Change,” 2007.
- [12] D. Magkafa, D. Watkins, A. M. George, and C. Mills, “Involving children in the design of gamified law-related tests participatory design and children’s voice for the design of gamified law-related tests,” in *Proceedings of IDC 2023 - 22nd Annual ACM Interaction Design and Children Conference: Rediscovering Childhood*, Association for Computing Machinery, Inc, Jun. 2023, pp. 454–458. doi: 10.1145/3585088.3593858.
- [13] L. Benton et al., “Designing for ‘challenge’ in a large-scale adaptive literacy game for primary school children,” *British Journal of Educational Technology*, vol. 52, no. 5, pp. 1862–1880, Sep. 2021, doi: 10.1111/bjet.13146.
- [14] M. Alam, S. Haque, A. Tripathi, and F. Vainionpää, “Prototyping a gamified system to persuade school-age children in developing countries: using Kahoot in online environments,” 2022.
- [15] E. L. C. Law, D. E. Watkins, J. P. L. Barwick, and E. S. Kirk, “An experiential approach to the design and evaluation of a gamified research tool for Law in Children’s Lives,” in *Proceedings of IDC 2016 - The 15th International Conference on Interaction Design and Children*, Association for Computing Machinery, Inc, Jun. 2016, pp. 322–333. doi: 10.1145/2930674.2930722.