"Dr-Ughhhh": A deterrent to children's future Drug Addiction

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Abstract:
Drug addiction has become a very important social issue lately. This paper proposes a system which may prove as a promising deterrent towards drug addiction among the children. It focuses on engaging users in Virtual Environment and provide them with an opportunity to investigate diverse perspectives to deal effectively in respect to drug abuse. It helps to evaluate and measure the impact that our designed Virtual Environment will have on students' understanding of drug abuse and also to enable children and teenagers make logical and informed decisions in their real lives after experiencing the risks and consequences of drug abuse in virtual environment. It proposes a system which consists of a prediction part and a virtual reality intervention to cure the addiction. The former predicts the probability of child getting addicted to drugs in the near future. The later is used in order to aware the children on drugs and help them overcome the drug prediction in future if any.

Keywords – Virtual Learning Environment, Information and Communication Technology (ICT) in Education, Prediction.

Introduction:
Drugs are a major concern and have become a curse effect on everyone's personal, professional and social life. The non-medicated consumption of drugs leads to intense craving that has spawned accidents, crime and violence. It is a disease which causes immense distress and its illegal production has risen to easy availability of drugs of which multiple drugs abuse and dependency is not a new phenomenon. According to the report given by the world drug, in the year 2009 there were 25,71,52585 users of alcohol, 8,22,88830 dependents on alcohol, 82,28,885 cannabis users and 2,057,220 opiate users in our country India.

We are living in a constantly changing digital world where ICT plays an important role on almost all aspects of our lives. Similarly, the digital revolution is transforming every aspect of children's lives. It would not be unfair to believe that the new generation of children will be doing almost everything with computers. Considering the importance of using ICT, especially in educational activities, education authorities should pave the way for implementing the strategies to empower ICT in supporting the teaching and learning process at schools. ICT is not just the bloom of the educational activities, but it will be also the alternative option to develop the effective and meaningful educational process.

In addition, Artificial Intelligence (AI) is used with digital games to provide entertainment as well as education. These types of games are known as serious games or educational games. Compared to traditional interventions, these games may help children and teenagers to increase their basic knowledge and understanding by engaging them in virtual learning environment. It can be a valuable asset in an effort to motivate and educate children and teens, who prefer learning through programs that they can control, such as video games. One possible application of serious gaming is to increase basic understanding and raise awareness of children and teenagers regarding the drug abuse and its consequences and risks in their future life.
The next section covers the primary objectives of our work. Further we will describe the literature review.

Objectives:

a. To engage users in VE and provide them with an opportunity to investigate diverse perspectives to deal effectively in respect to drug abuse.

b. Evaluate and measure the impact that our designed VE will have on students' understanding of drug abuse
c. Determine the prospective role that VE can play in changing or upgrading the school curriculum accordingly.
d. Encouraging the teachers and educational science researchers to partake in the design process of the intended VE.
e. To enable children and teenagers make logical and informed decisions in their real lives after experiencing the risks and consequences of drug abuse in virtual environment.

Literature Review:

Reasons of Drug Addiction in Children:

To understand the causes of drug addiction, we researched a few papers.
Ajay Kumar ,InduDangi , Dr. RS Pawar: [1] The author has proposed that no one factor can predict if a person will become addicted to drugs. A combination of factors influences risk for addiction. Changes are made in the brain that support physical & psychological dependence on mind-altering substances which are said to be the direct cause of addiction, but these changes do not occur randomly. For eg:

- *Biology*: A person's birth genes account for about half of a person's drug addiction risk. A person's gender, ethnicity, and the presence of other mental disorders also tend to influence risk for drug use and addiction.

- *Family history*: Your birth genes are responsible for almost half of your odds. If the family is ignorant to drugs, there's a possibility of you being ignorant as well. Women and men have equal chances of getting addicted to the drug. Studies have determined that genetic factors are about 50 percent responsible for the development of drug addiction, and one of the surest identifiers of genetic risk is having blood relations with people having dependencies on drugs.

- *Environment*: An environment in which a person leaves includes many different influences, from family and friends to economic status and general quality of life. Factors such as pressure from friends, abusing sexually or physically, drug exposure, stress, and guidance from parents can affect how a person is affected.

- *Problems at school or work*: When a child miss his school or work regularly, a rise of disinterest in school activities or work, and a sudden drop in grades or work performance

- *Mental disorders:* When there is depression in your brain, you find it difficult to pay attention to your work, there's a slight chance of addiction. Person start drugs to feel better.

Marian Jeˆdrzejczak, PhD: [2] Analysis of the family environment of young people in danger of drug addiction indicates several alarming signals: (1) Very often, young people stay in the company of persons whose behaviour and social norms are unacceptable. (2) Its practically unrestricted to access different kind of drugs; dealers reach children of young age, very often using pressure, encouragement, or even "promotion" of goods. (3) The surrounding of similar age of people leads to peer pressure. Parents tend to delay, not infrequently from strangers say a physician, a teacher, or a police officer, that, finally as a result of the applied forms of relationships with the child and of educational errors, has led the child to be in a dangerous circle and to take drugs. "Not to treat but to prevent"; such a motto leads to quick procedures toward families struggling alone with the dependency problems. It must be thus emphasized that ceasing should be carried out by providing all attainable forms of help to serve the process of supporting the family.

Table 1: Causes of Drug Addiction

Genetics & Family History	Your genes may mean a greater predisposition to addiction. Your body and brain react to a particular drug the way your ancestors reacted to it. If your parents or their parents had a history with drug abuse, your chances of being addicted to drugs increase drastically.
Environmental Cause	Your environment also plays a vital role in developing drug dependence. Because the environment influences behaviour, if a child grows up in a home with a drug addict, it's highly likely that he is going to struggle with drugs too
Psychological Cause	Although genetics and environment play a significant role in drug addiction, psychological factors also contribute to the problem. Sexual or physical abuse, negligence from parents and peers, domestic violence, everything can lead to psychological stress. And people turn to drugs to let off this stress. Over time, this misuse of drugs can become an addiction.
Other psychological causes	• Mental disorder such as depression • Lack of friends in school or any social setting • Huge academic pressure • Traumatic events

How effective are Educational Games?

This section describes how educational games are effective. We also researched numerous papers to review the current method.

Heitor Martins Pasquim, Cassia Baldini Soares, & Ricardo Santoro: [1] The author proposed that educational games can foster discussion of differing views on social values; enable intense, pleasurable, and interactive participation; and produce reflection on health issues. Emancipatory education which is a process constructed from a collective health system, is a powerful tool that promote understanding of the social determination of health; the process can potentially politicize this drug phenomenon. Here drug production, circulation, and consumption are pedagogical contents which increases awareness, while it also reduces harm among users and non-users.

This education also helps to expand interests. In the case of drugs, education can help youth to understand how the system of production, distribution, and consumption of these substances are related to capitalist structures and dynamics. This explanation politicizes the discussion and critiques the psychiatric explanation, which maintains that individual biology is the cause of drug use. This debate also questions the pharmacological explanation that focuses on the action and power of drugs on the central nervous system. Educational games in the collective health framework may be a powerful method to stimulate critical discussions on complex issues from the perspective of the players; such games take on an emancipatory quality by generating new social practices.

Eduardo FilgueirasDamasceno, Paulo Augusto Nardi, Adriane Carla Anastacio Silva, Alexandre L'Erario : [2] The author says that the lack of success of advertising campaigns on drug use is attributed to the use of inappropriate language at the people of very low age. It is seen that a digital game is more effective as it is attractive in this case for children. This shows the use of a Digital Game which was developed as a deterrent to addiction, with a language and approach for a youngsters. The chosen methodology was kind of qualitative descriptive through various question sets administered to two distinguished groups in a school totalling 69 subjects. The goal of this research project was to make sure how communication is the story and how the data on the preventive methods of drug use are effective for a particular people of young age.

Drug Addiction Treatment through Virtual Reality

This section reviews the literature in the available papers and it focuses on the drug treatment through virtual reality.

Yue Yuan, Jing Huang, KeYan : [1] The author proposes that with the continuous development of machine learning technology, machine learning methods have broad application prospects in medical data mining. This proposes a method of using virtual reality technology to assist drug addiction treatments with a sample size of nearly 60 drug abusers in a drug rehabilitation centre located in Zhejiang province, China. Physiological data of concentration and heart rate in the process of drug addicts watching Virtual Reality videos in different scenes are collected. A hybrid machine learning technique is used that combines principal component analysis (PCA) with K-Means++ clustering algorithm is used to group together drug addicts to find out the relationship between cardiac physiological characteristic data and treatment effect. The experimental results show that after VR treatment, the mean and standard deviation heart rate of the patients have decreased significantly, which provides a firm evidence that the response of patients have been decreased after the virtual treatment. Hence it was observed that virtual treatment is quite effective in reducing intoxicating behaviour.

This study proposed a hybrid ML method to check how effectively do VR treatments work on drug addiction. The sample size contains of a total of nearly 60 drug addicts located in the drug rehabilitation center in eastern China. In total 4 treatments have been performed. In each treatment, 5 Virtual Reality scenes were shown to each addict; and his/her heart rates and concentration measurements are collected. To pre-process the high dimensional data into 2-dimension, PCA is used. And the K-Means++ clustering algorithm is applies to group the patients into three levels. Then the heart rate and concentration measurements -means are observed in all the levels. The after results assure that both measurements reduce along with the count of Virtual treatments. Hence, the VR treatment is proved to be helpful in treatment against drugs.

The technique described by the authors is to answer the given research question, we should analyse the set of questions in the system to predict any possibility of drug addiction in future. This set of questions would consist of some direct and some indirect questions related to drugs. If the test results positive, children would be made aware about the harmfulness of drug abuse.

Literature on related topics suggests that various algorithms/techniques have proved to be successful in most of the cases to predict possibility of drug addiction. Also, research has been done on the various reasons of drug addiction in near future. Virtual Reality based techniques could be used to take children away from the possibility of drug addiction. According to the research, these VR techniques have proved to be successful.

Methodology:

- The user needs to enter his or her details. He needs to enter various fields like name, email, age, etc. At the back end, the input fields are validated if entered in correct format. And they are stored into the database.
- The user is enquired by asking a number of questions. Some indirect questions and some direct questions related to drugs to check his/her awareness about the drugs. The answers are evaluated and a score is generated.

- After the score generation, a VR game is started for the child and he has to play it till the last scene. This would help us bring the awareness in the mind of kids about the harmful effects of drugs.
- The end report is generated and it is displayed on the screen of the game. It is finally mailed to the registered email-id.

Pseudo Code:

PHASE 1 - Stage 1 :-

StartTest

getQuestion with objective multiple options.

Select a single option per question

Submit the answers

Calculate the number of question submitted by user.

If not last question

Repeat again the above steps.

Else

Finish

Calculate the average of 1st level.

Stage 2 :-

getQuestion in ImageFormat and text

get multiple option in answers

select exact option/answer by users

calculate the number question count

if question is not last

repeat again above methods

else

Finish

Calculate 2nd stage average

Stage 3 :-

Play game with multiple question on Button

View question and suggest answer

Select answer

Credit score as per answer

While

Continue 2nd phase.

PHASE 2 –

While !check all question is done/check

If in case all question is

Not solve by users

Repeat upto last question

End while

Calculate the total score

Calculate the overall average from stage 1,2,3

If score of user is less

Score is less than 30% -> Addicted user

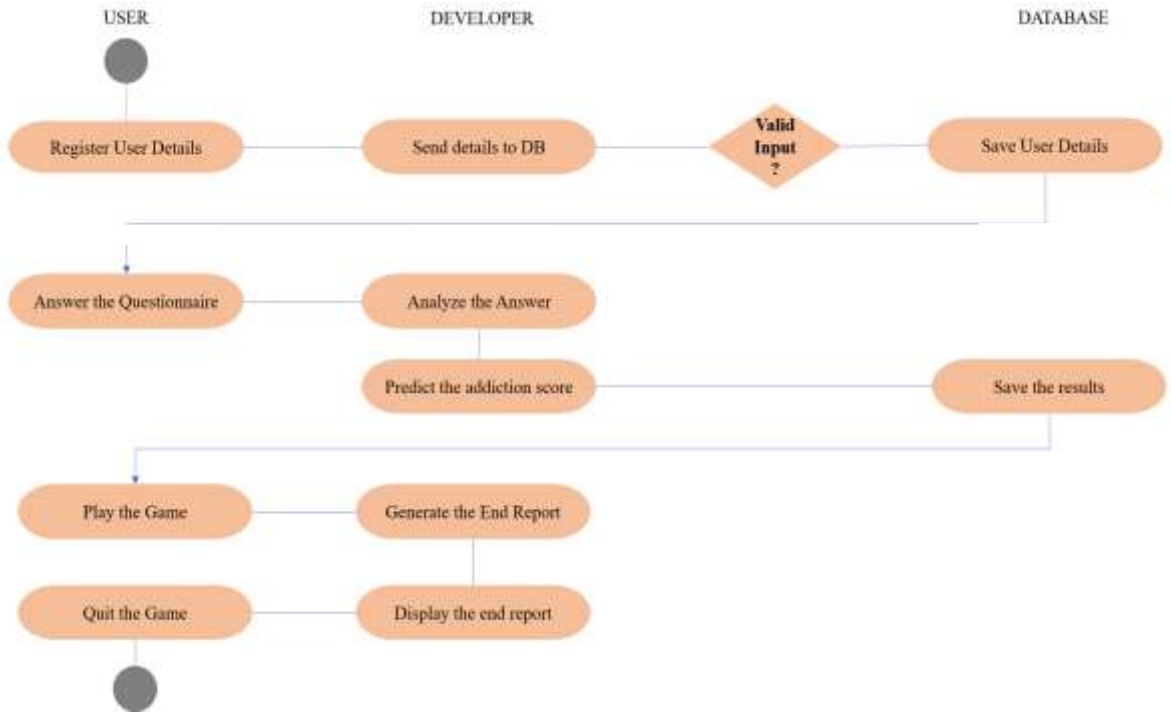

Fig.1 Basic Architectural flow of the process

Conclusion

With an increasing problem of drug abuse in the world, it is very important to take early precautions for our children.Hence, this system would be helpful in making the children as well as the parents aware about the state of mind of the child and take proper precautions.The work presented in this article faces some challenges. The major challenge is how to manage user's interactivity in an interactive narrative. Last but not least, keeping the participants/users on the track and maintaining a balance between entertainment and education is another challenge that needs to be handled properly.

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