



Designing for Children

- With focus on 'Play + Learn'

Food Force II: Community Learning through Storytelling

Manu Sheel Gupta
CEO, SEETA organization (Software for Entertainment, Education and Training Activities)
manu@seeta.in

Vijit Singh
Software Engineer, SEETA
3rd Year Undergraduate Student, Netaji Subhas Institute of Technology (NSIT), New Delhi
vijit@seeta.in

Abstract: Researchers are always finding out new and innovative ways to impart education. Storytelling through textbooks fits well with bringing experiences into perspective. However, the lack of active engagement missing in the stories is a major drawback in reference to sustainable learning because of which this method is not used beyond the primary educational level. We have been exploring models for sustainable learning through storytelling, engagement, and collaboration, and have observed that community learning games on computers comes nearest as a solution. We have implemented our notes from the field in a learning activity - Food Force II, which we have observed as unique in its educational delivery. The paper describes this learning activity and also the effect of imparting education through this interactive platform in comparison to the conventional methods of teaching.

Key words: *collaborative environment; game-play; sustainable development; storytelling; social change.*

1. Introduction

Education is generally conceived as a straightforward progressive, cumulative process. It is characterized in terms of development, growth, accumulation of knowledge, skills, and experience; it is "hierarchical integrative," in which the earlier stages are ideally incorporated into more sophisticated later stages [1]. The values and facts learnt by a person in childhood stage plays an important role in carving his future and in modeling a person's behavior, skills, achievements, and contribution to the society in the later stages.

So, what a person is taught in these earlier stages of life and the way of imparting that knowledge becomes really very important.

There are a lot of ways of imparting education but the one which has always overshadowed all the others is the old-fashioned method of learning through textbooks in classrooms [2]. The children are supposed to go to schools where a fixed curriculum is set. They are supposed to mug up the lessons before exams and their performance is judged purely on the basis of the marks gained in the exams [3]. However, such a model has not been able to deliver in its entirety, and help build the required base for children to think about real world problems, and come up with plausible solutions. On the contrary, it suffers from some serious loopholes. First, students in traditional, teacher led classes have little control over what they learn and are passive recipients of material chosen by teachers [4]. They hardly enjoy what they are made to study. Second, the engagement with learning in such a delivery model is passive. And, learning should be active. Otherwise, the process results in a meager collection of facts and figures with no direct relevance to the real world. Third, it has been seen that such a method has adversely affected the health of children in many cases. Recent studies have shown that the increasing mental pressure have led to increase in suicidal cases among the children and youth [5].

The educators' community has been trying to define innovative methods of imparting education. Education through storytelling has been put forward by many researchers as an effective methodology [6].

2. Previous Work

Almost all children in their initial years hear stories from their parents or elders. Classical stories like 'The Panchatantra of India' or 'The Aesop's fables of the Greeks' develop humanitarian skills in a child [7]. A child forgets a number of things, but these experiences are long remembered. What makes these stories so memorable? If we examine these classical stories their most evident feature is that they are built on simple yet powerful abstract concepts like good/bad, security/fear and courage/cowardice. Their content is made accessible and meaningful by being articulated on basic abstract concepts to which small children and toddlers have direct access [1].

Despite of the goodwill, storytelling has been subdued as an educational delivery mechanism at a basic level. It has been disregarded to be considered as a concrete

method of education at higher levels. Educators, however, are trying their level best to explore this field as a complete learning platform for primary as well as higher studies [8]. Experiments are being made to prove the supremacy of stories as a method of teaching over other methods. In one of the experiments conducted by MIT media Labs, potential of stories and design have been tested in an Irish Primary school and positive results have been obtained [9]. Another promising initiative has been the use Wiki as a Tool for Web-based Collaborative Story Telling in Primary School [10].

Still, more concrete results are required for storytelling to be considered as a complete educational platform. Better techniques need to be evolved to teach current curriculum through stories.

3. Vision

The quest to evolve better techniques and practices for education through storytelling has unfolded interesting learning strategies for us. We explored models for sustainable learning through storytelling, engagement, and collaboration, and observed that community learning games on computers comes nearest as a solution. We have implemented our field learning in a learning activity - Food Force II, which we have observed as unique in its educational delivery. The features which make Food Force II a unique initiative are listed in the following sections-

3.1 Active engagement

The lack of active engagement in the stories is a major drawback in reference to sustainable learning because of which this method is not used beyond the primary educational level. Though stories are interesting and educational, they have not evolved as a complete solution to provide a practical environment to the children, where they can apply their experiences.

We believe that learning through interactive participation is a much better approach than simple listening or reading [11]. In Food Force II, the children can take roles of the game characters and are able to pursue experiential learning virtually, closest to real-time learning. This has an improved impact towards learning.

3.2 Improves Teacher and Student Relationship and Integrates Curriculum in Stories

The educators have been identifying new methods to integrate curriculum in these stories. We believe that Food Force II seems very promising in addressing this area. We are

currently developing a story builder tool to be integrated with Food Force II. This tool will enable teachers to easily integrate their lessons and make new storyboards, which can be played by students. We believe that this will help explore better techniques for integrating curriculum lesson plans in stories.

3.3 Collaborative environment

Learning needs to be collaborative. Studies have shown that most children learn faster in groups rather than in an isolated environment. However, stories do not necessarily solve this requirement of learning in a collaborative environment.

We have tried to focus on community engagement and collaborative learning. Food Force II being multi-player, helps children participate in a collaborative environment to enhance their team-working skills, and thereby improve their leadership qualities. They are able to learn from wise-decisions made by their peers and are also warned about the wrong decisions taken by them.

4. FoodForcell: The Educational Platform

4.1 Theme and Storyboard

Almost half of the world today works with wages of less than 2 dollars per day and hunger and malnutrition kills more people every year than AIDS, Malaria and Tuberculosis combined [12]. A child dies of hunger every five seconds. Thus, there is a need to address the problem of world hunger by involving children, since they are not only our future but are also the worst affected with this problem. Children, not only need to be made aware of these issues, but also need to be equipped with knowledge to tackle them. They need to learn about nutritional intake of meals and make people living in their immediate environment aware about them. Through FoodForcell we have tried to address these important issues.

The game currently has a storyboard, which is developed from the viewpoint of an Indian villager. The player is taught about development and maintenance of the village, trading, collaboration and crisis management.

4.2 Building Blocks

The game has been modelled around a few key elements or building blocks-



Figure.1 General View of the village in FoodForce2

4.2.1 Facilities

Facilities are installations, which serve the villagers. They play a crucial role in the functioning and development of the village.

4.2.2 Resources

Resources form the essence of any community. Resources are required to setup facilities and are also consumed constantly by the people of the village.

4.2.3 Indicators

Indicators are a measure of the development of the village. They aim at providing a holistic approach towards assessing the development work taking place in the village.

Arriving at a good balance on all the indicators presents a challenge to a child. He/she needs to strategize his/her decisions in such a way that they don't have an adverse effect on the coming generations.

4.3 Game Play

Children are asked to place themselves virtually in a rural area, where they build their homes, invest resources, time and energy for their day-to-day living and manage crisis.

There are three major aspects of the game:

4.3.1 Construction of Facilities

Constructing new facilities requires resources. Once the facilities have been built, the users start producing resources and help in the development of the village increasing the productivity and indicators.

4.3.2 Upgrading Facilities

Once a facility has been built it can be upgraded to produce more resources. An upgraded facility will be more efficient.

4.3.3 Trading of Resources

The final cornerstone of the play is trading which is crucial to a village's success. The price of the resources is determined by market forces.



Figure.2 Trading in FoodForceII

4.4 Key learning Areas

In the development of FoodForceII we have focused on certain *key learning areas* which are mentioned in this section.

4.4.1 Teaches humanitarian values

Through the chats provided through the game, we teach children how to respect their elders, to care for the poor, they work to help develop homes and other facilities for the needy villagers. The game makes them more humane and responsible human beings.

4.4.2 Crisis Management

Food Force II teaches crisis management by providing simulated crisis scenarios. The player is supposed to tackle situations like occurrence of earthquakes or floods in the village. The game choices available to players and their actions are constrained by economic, social, and physical realities of life in a village.

4.4.3 Improving analytical abilities and Strategy development

Food Force II is a strategy game in which decision-making skills of a player have a high significance in determining the outcome. In the game, a child is supposed to plan and execute strategies in such a way that he/she can make optimum use of the resources available, so that the village can become self-sustainable in the long run.

4.4.4 Trading

FoodForcell assists children to make negotiations and trade resources.. It develops skills for unbiased, rule based and nondiscriminatory trading system.

4.4.5 Technology and its use

Food Force II demonstrates the impact of using technology in the development of various facilities like hospitals, housing and workshops. It also teaches the various roles of technology in the growth of mankind.

5. Experiments and Results

5.1 Experiments

The interaction with community of educators, children, developers and artists is critical for the success of a project like this one. To analyze the impact of learning through storytelling and Food Force II in particular on children we did comparative studies of children, who had played the game and ones who didn't. We went to different schools to demonstrate and get feedback from children and teachers. Here we are mentioning about one of our studies which we did at Delhi Police Public School, Safdarjung Enclave.

The content in Food Force II is meant for children in the age group of 9 to 14 years. So we focused our testing on the students of class 6th, 7th and 8th. All the students were divided into three groups A, B and C.

Group A students played FoodForcell. It was observed that they were actively engaged in quick and varied activity. Students also shared tips and trading skills, while playing.

Group B students were given a lecture about the urban issues. They absorbed this information in a routine passive manner. They regurgitated this knowledge on pencil and paper tests rather than applying it in any dynamic context.

Group C students were given the books to read and understand about urban issues. Group C students learned at rather slow pace in comparison to the students of other two groups. They were given very little freedom to manage the content and pace of their learning. It was observed that these students performed in isolation couldn't share their knowledge.

In the end of this session, each and every student was given a questionnaire based on cognizance and logical reasoning. Questions based upon logical reasoning were for testing the ability of children to engage them in reasoning about various things learned in game play like trading, collaboration etc. Questions based upon cognizance were for testing the ability of children to perceive, or to be conscious of events, objects or patterns and cognitive reaction to a condition or event.

Data Collected from questionnaire is plotted in the bar graphs.

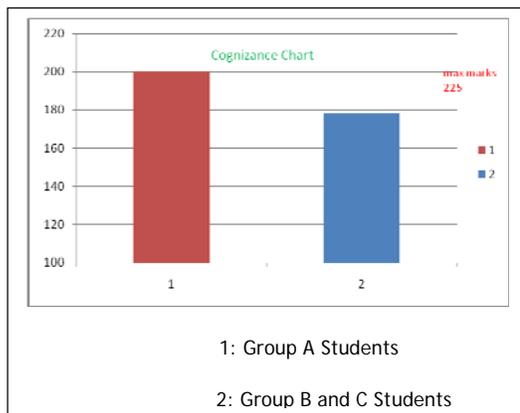


Figure.3 Cognizance Chart

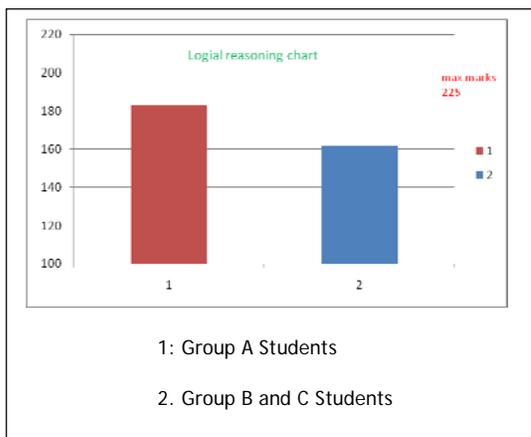


Figure.4 Logical Reasoning Chart

5.2 Results

From the above graphs it can be inferred that students who played FoodForcell had scored better than students who learnt from books and lectures. It was also observed that students were eager to learn by playing game rather than old traditional passive methods.

Not only students but also teachers were highly impressed with this innovative method of learning. Some teachers even recommended this new education tool as a part of their academic curriculum.

Food Force II lets player think, talk and act while playing and hence it creates an interesting learning environment. It gives opportunity to work in groups, which increases the learning capability of students. Instead of regurgitating their knowledge, students learn dynamically as Food Force II lets them to inhabit roles, otherwise inaccessible to them.

6. Inferences

From our study, we tried to establish storytelling as an important approach towards community learning. We found out that an educational platform like Food Force II, where children can not only read stories but play them as well, is a powerful approach of sensitizing children towards the social problems, and in the process teaching them curriculum lessons.

7. Future Works

We are very much in the start-up stage of Food Force II project, and have been trying to develop ideas and make observations on a number of questions -

- a) What are the problems faced by children and teachers in following this teaching paradigm? How can we address these issues?
- b) How can better evaluation of students be made using this technique so that teachers can realize the weak areas of their students and help them improve upon them?
- c) Can this method of teaching be used for older age groups as well? If no, then what are the customizations required?
- d) How can subjects like Chemistry, Mathematics and Physics be taught using this methodology?

8. Acknowledgments

We would like to thank One Laptop Per Child(OLPC) and World Food Programme(WFP) for their constant support in this endeavor. A special thanks to teachers and students from Delhi Police Public School, Safdarjung Enclave to help us in our study of understanding the

impact of Food Force II towards learning and to incorporate the platform in their learning curriculum. We also wish to thank YW Stefania, Maryam Funicelli and Federico for their contribution in the project as artists.

9. References

1) Egan, K. (1988), ierg.net [Online PDF].

Available at

<<http://www.ierg.net/assets/documents/ideas/supplement.PDF>>.

2) Shulman, L. (1986) Paradigms and research programs in the study of teaching: A contemporary perspective.

3) Sadler, John Edward. Book on Concept of Universal Education.

4) Bowman, R.F. (1982) PacMan Theory: Tactical implications for classroom instruction. *Educational Technology* 22(9), 14-17.

5) Wolfgang, Rutz; Wålinder, Jan; Knorrning, Lars. (1997) Prevention of depression and suicide: impact on male suicidality. An update from the Gotlandstudy, *International Journal of Psychiatry in Clinical Practice*, Volume 1, Issue 1.

6) McDrury, Janice and Alterio, Maxine. (2002) Learning through storytelling in higher education: Using reflection and experience in higher education contexts, Dunmore Press Limited.

7) Carter, K. (1993). The place of story in the study of teaching and teacher education. *Educational Researcher*, 22(1), 5-12, 18.

8) Rossiter, Marsha. (2002). Narrative and Stories in Adult Teaching and Learning, EDO-CE-02-241, Eric Digest.

9) Martin, Fred G.; Butler, Deirdre and Gleason, Wanda M. (2000). Design, Story-Telling, and Robots in Irish Primary Education, Submitted to IEEE Systems, Man, and Cybernetics conference October, Nashville, Tennessee.

10) Désilets, A. and Paquet, S. (2005). Wiki as a Tool for Web-based Collaborative Story Telling in Primary School: a Case Study. Published at EdMedia, World Conference on Educational Multimedia, Hypermedia & Telecommunications.

11) Roussou, Maria. (2004). Learning by doing and learning through play: an exploration of interactivity in virtual environments for children. Published *Computers in Entertainment (CIE)*, Volume 2, Page 10.

12) United Nations (2005). The millennium development goals report, United Nations.