

# A Culturally Contextualized Narrative Game for School Children in Developing Countries

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**Abstract:** Nowadays, at Brazilian schools there are many educational challenges in order to teach some skills that are part of the student's education and life, such as: teaching students to express themselves and to work in group. Teachers do not easily find a tool that can support them to work collaboratively with their students considering their pedagogical objectives. Therefore, it is presented here an educational computer narrative game to support teachers so that they can work collaboratively with their students through contextualized storyteller. Taking into account their socio-cultural reality, myths, knowledge and using common vocabulary. Consequently, these students will be able to identify and get interested in developing the story. Students can learn how to express themselves, i.e., they can leave their imagination flow and it can allow them to adequately understand and elaborate situations experienced at school, in the family and community with no impact on their real lives.

**Keywords:** Collaboration, Storyteller, Narrative Game, Context, Common Sense, Education, Educational game.

## 1. Introduction

School environment is very important to the children's intellectual and socio-cultural growth so that they can expand their social, interpersonal, cognitive and linguistic skills. The quality of relationships established at school, especially at the elementary school, can affect their learning and development. Because of that, the relationship among students and between students and teachers is very important. Another important issue at school is to Know how to cooperate, to negotiate, to express, i.e., how to work in groups. These skills should be learned during childhood. In Brazil and in other emergent countries teaching those skills at school is still a challenge.

Another skill that is important in education is to know how to live and to communicate with different people because each person has his own culture, values and socio-cultural reality. These abilities are part of fundamental educational objectives because when children participate actively in their class,

they cooperate with the teacher and other students, building their own knowledge (Diaz-Aguado, 2003). On the other hand, activities to promote work in group can rarely occur spontaneously (Diaz-Aguado, 2003) so that teachers and students need to have activities and tools to support this new way of studying. Because of that, it is presented here as an educational computer narrative game to help teachers to work collaboratively with their students through storyteller.

This game is inspired on Role-Playing Game - RPG (Bittencourt *et al.*, 2003). In this type of game there are participants, which are the players and the master, who is usually the most experienced. His task is to present the story to a group, with characters, their characteristics, scenarios; i.e., the necessary descriptions to compose an adventure with puzzles, situations and conflicts that require choices by the players.

These players are not just spectators; they contribute actively in the story through their characters that choose paths and take their own decisions, usually not foreseen by the master, contributing to the spontaneous and unexpected development of the story. The master can interfere in the narration, describing the scenarios, the characteristics, the objects and proposing situations so that the characters can interact. In the context work the master is the teacher who introduces the story and intervenes collaboratively together with the players. The players are the students, the co-authors of the narrative.

The master defines a common objective to the group. For instance, he provides something so that the students can guess the end of the story. Therefore, each person through the character needs to collaborate with each other to achieve the objective. Nevertheless, students need to identify and get involved in order to develop the story. Therefore, this narrative game allows teacher to create stories according to the student's social and cultural reality, taking into consideration the students' culture expressed in common sense knowledge. Because of that, teachers use a vocabulary that is familiar to the students, considering their myths, beliefs, taboos and knowledge.

Students have the opportunity to be closer to the contextualized stories, allowing them to participate and express themselves. Teachers also can monitor the children's learning process through the stories, support them and intervene whenever necessary. So that they can promote a safe and healthy student's development.

Collaborative storytelling enables people to be attentive and interested in what is happening in the story in order to understand it and consequently to contribute to it. That attention and concern to understand what other people say allow them to be closer because they are more interested in what the other person has to say, even indirectly (Oaklander, 1988).

Fantasy in narrative games allow people, especially children, to feel safe to express themselves, to talk about situations that occur in their lives because they believe that what happens in fantasy has little or even no consequence in real life. Therefore children often think that it is easier and safer to express themselves through characters; they feel less threatened to express hostility in the story

because they express their emotions, joy, sadness, anger and euphoria through their characters that act in accordance to people's emotion.

According to Oaklander (1988) children do things, behave and move in their fanciful world in the same way in their real world. Because of that narrative games for their free expression and support to try experiences are useful. Narrative games may help children to express, and the teacher to have the opportunity to observe the children's behaviour throughout the story, also permitting a genuine contact among themselves.

This game has been developed for children from 8 to 12 years old. According to Piaget (1999) in this phase the children are in the stage called Operational Concrete Thought. In this stage child has great interest in games and finds new ways to play and to work collaboratively. These are important features for a game that allows people to tell stories collaboratively.

In this phase children develop academic instruments such as reading, writing and basic math, and they are able to focus their attention. Thus, children have the capacity to read the story being told, to help to write it, i.e., to participate in building the story and to give attention to the whole story (Piaget 1999).

During Operational Concrete children are willing to make friends and want to participate and interact with other children's game. Therefore, there are great chances that children can be interested in participating and interacting with the story being told collaboratively.

This paper is organized as follow: section 2 is about related works and the game's prototype is presented; section 3 describes the common sense knowledge use and collect; and section 4 presents some conclusions.

## **2. Narrative Games**

There are many narrative games that teachers use in the classroom, such as: *Aulativa* (Lopes et al., 2003), *Taltun* (Tobaldini et al., 2006), *Revolution* (The Education Arcade, 2008), *Neverwinter Nights* (BioWare, 2008), among others. For example, *Revolution* is a game based on historical events of the American Revolution. This game teaches students about historical events that includes the daily social, economic, and political; *Neverwinter* is a game that is set in a huge medieval fantasy world and it allows students confront educational tasks and puzzles.

All these games have common characteristic, as a previously defined context. They have a fixed set of characters, scenarios and themes to the storytelling. Because of this, if teachers want to use these games, they need to adapt their classes to the games rules. They also do not consider student's culture, knowledge. Some researchers Papert (1985), Wertsch (1988), Freire (1996) have described that when children identify the relation between what they are learning and their reality, they feel themselves more interest. In short, they can identify that

the semantic of the words is significant to their life, because it is close to their reality.

Because of this, the narrative game proposed in this paper, Contexteller is a storyteller environment contextualized by common sense knowledge and it intends to support teachers in telling stories collaboratively with students according their pedagogical objective.

## 2.1 Contexteller

Figure 1 shows the interface available for players. This interface allows the players to see their card (I), their dice (II), and the text area (III), which they can read all the messages sent to them and master during the composition of the collaborative story. In area (IV), the card, with another color and size, represents the master of the game, and area (V) shows the cards of other players.



Figure 1. The interface of the Narrative Game

The card (I) has some RPG elements, such as: Magic, Force and Experience. The values of the first and second elements are defined by the players but they need to consider the overall scores previously set by the master. These elements are considered to be one of the rules existing in RPG. This rule avoids many discussions that could occur during the story. For example, knowing what is the strongest or most powerful character. The values of the elements are numbers to be considered in some situations. For example, a character with Force equal 5 is more likely to survive a crash than a character with Force equal 2.

Piaget (1999) describes that children from 8 to 12 years old have Serial Sorting relationship because they can range from the highest to the lowest value but they have difficulty in understanding when something is presented in abstract form.

Therefore, this game uses numbers to represent the values of Power, Magic and Experience elements, and also uses plus and minus signs to change the value. Through the numbers, children can understand the values of those elements can increase or decrease and can compare it with the values to other players' elements.

The master attributes the value of the Experience when the character achieves a particular goal stipulated during the development of the story, in short, dynamically. This latter element stimulates the student to play carefully, to want to confront and to overcome the challenges.

The master can offer advantages to more experienced players, for example, when it is necessary to choose between two paths to be taken in a story. So, the teacher can allow the player, with the highest value of experience to choose between the two paths. This value can also add advantages to other character's card elements.

Therefore, these three elements together with the master's narration provide competition to the game, even indirectly. According to Crawford (1982) conflict is an important characteristic of the game. He reports that there is no game without conflict, even when there is not direct competition among the players.

The dice (II), which is part of the RPG, shows the players and the master whether a particular action is possible, or not (Silva et al, 2008). For example, to raise any object it is necessary to have the value of the Force element equal or greater than the value of the object weight. This weight is defined by value of the dice thrown by the player. Thus, the player can raise the object if the value of the Force is equal to N and the value of the dice is from 1 to N. If the value of the dice exceeds N such action will not be possible because the value of the weight of the object is more than the value of the Force element.

The interface of this game has 6 cards, 5 players and 1 master. Number 6 is usually used in RPG of cards (Fernandes, 2008). 5 players also facilitate the master (teacher) to monitor the whole story that is being told by the players (students). If the number of players was greater than 5, the master could face difficulties in reading all messages, in interacting appropriately during the story and in observing the development and behaviour of each character.

This game intends to enable the teachers to get to know their students and the students how to express themselves and to work collaboratively. So teacher needs to be attentive to all messages, to interact and to instigate the students to continue the story. These features will allow the master:

- Having more attention to each player. According to Piaget (1999) when somebody wants that the children learn the moral of some story, it is necessary spend some time talking to them about it;
- Knowing the way and often that the players contributed with the story. If master to observe a player avoiding to say something or disinterested in the story, the master can interact with the player. He can comment or ask about events of the story, in short, instigating the player to participate of the story.

To help teachers to create and to tell stories this game has as objective to give computer support to the master so that he can get help from contextualized information, both in the initial phase , i.e., the composing of scenario and characters to be presented and in other phases, such as: story definition and sequence. This support is obtained through common sense that represents cultural aspects of the students' community.

### **3 Use of common sense knowledge in the narrative game**

The game proposed in this paper, uses the common sense knowledge obtained by the Open Mind Common Sense in Brazil Project (OMCS-Br), developed by the Advanced Interaction Laboratory (LIA) at UFSCar in collaboration with Media Lab from Massachusetts Institute of Technology (MIT).

Common sense is a set of facts known by most people living in a particular culture, "covering a great part of everyday human experience, knowledge of spatial, physical, social and psychological aspects. In short, common sense is the knowledge shared by most people in a particular culture (Anacleto, 2006).

OMCS-Br project has been collected common sense of a general public through a web site. It can be accessed by anyone through <http://www.sensocomum.ufscar.br>. After entering, the person can register and have access to various activities and themes available in this site. One of the themes available is about Children's Universe, which allows people to talk about situations, objects and characters existing in the Children's Universe, such as Folklore, Fairy Tale, among others.

In this game, the common sense information is obtained through cards, which are presented on the master's interface. These cards allow him to use common sense knowledgebase in the story script and definition. For example, through this common sense knowledge teacher can obtain characters or/and their characteristics.

The teacher can combine such information with the story that he wants to tell and to define the characters and their profiles and personalities. Each player needs to choose a character to participate in the story. During the story the teacher also has support from common sense to analyze the context and see how to interfere on the narrative, whenever she or he thinks it is necessary. As followed there is an explication about how the teacher uses this knowledge to create the game and to conduct the story. Six steps are needed to create the game:

First, some information about the teacher is stored, such as: name, state, city, among others. Throughout this data it is possible to identify which teacher has created the game.

Second, it is defined which students are going to participate, their names, states and school education are some important information (Figure 5). The teacher can identify which students played and how each student told the story. Therefore, the teacher can observe children's behaviour, evolution and growth, for example, comparing children's attitude to the first and last stories.

When the teacher registers his students before creating a story, he takes into consideration who are those students in order to define the characters and the plot. After the registers Contexteller gets the students' state and filters the common sense base considering the knowledge collected from the desired profile in order to contextualize the game content for the target group.

Step three, the teacher need to choose one between two options: Creating a new game or Choosing a existing game. If the teacher chooses the second option he/she can use another game that he/she or another teacher created.

Step four is shown in Figure 2. In this stage the teacher needs to define the six characters: one represents her/him and the others represent students. There are two common sense cards to define characters' names and characteristics.



Figure 2. Define Character

On the first card (I), the teacher types a characteristic and through searching the common sense knowledge base obtains the characters' names. For instance, if the master wants to use a character in the story that likes to joke, to trick and to scare children, he/she can type these characteristics on the card. Through the common sense knowledge base can be seen the following characters: Saci-Pererê, Iara, Curupira, Caipora (from the Brazilian folklore), Joker (from Batman's), among others.

In the second card (II), it is possible to obtain the characters' characteristics when characters' names are written on the card. For example, some characteristics coming up from Iara's character are: a mermaid, long hair, beautiful, a fish tail. The teacher can join such information to the story to define the characters, their profiles and personalities.

Figure 3 illustrates the fifth step in which teacher needs to define the values for Magic and Force, and find an image to represent his characters. Step six, it is necessary to define a subject and a title for the story. In this step the teacher uses common sense typing a word on the common sense card, and receiving contextualized information about this word. For example, the teacher types: "forest" and obtains characteristics, character, and other data that their students believe exist in the forest. Such as: Place with many trees, animals, vegetation; there are bears, lobes, monkeys; and some other characters, for example, from the Brazilian folklore. This information can be used to define a title.

After these steps, students choose a character to participate, in a similar interface shown in Figure 2, define Magic and Force values, and find an image (Figure 3). This feature allows the student to express himself not only through the story but also through the image. He can choose an image that makes his character

sad, joyful, angry and so on. These emotions and their expressions can be a feature considered by the teacher when observing and developing the story.



Figure 3. Specify Character

During the stories the teacher can get support from common sense knowledge. Figure 4 illustrates a situation where Iara's character does not play because she is very worry about the fire in the forest. The master searches for fire in the common sense card and continues the story with the help of contextualized information.

Through this search the master knows that children in that community believe that Iara can be helped by Caipora because the latter is responsible for taking care of the forest and preventing fire. This character exists in the story, and then, the master talks to Caipora whether she can help Iara.

Searching on fire, Caipora shows up and if the master does not know who her and how she can help Iara, it is possible to search about Caipora to obtain some information about her, such as: prevent fire, care of the forest, etc.

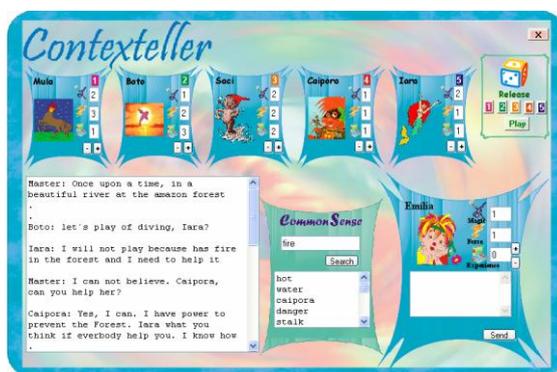


Figure 4. Master's interface

There are many characters that prevent fire and take care of the forest but in a specify region children know that Caipora has these characteristics. If the teacher obtains this information through common sense, he/she can tell the story considering the students' reality. In order to provide common sense information about any Brazilian region, the teacher selects a filter in the initial phase. This

filter is used to obtain the common sense from a certain community or group of people, for instance, teenagers from São Paulo in Brazil.

On the other hand, it is important to explain that the objective of the card is to help the teacher to find out what students know about a story or even about events, causes and consequences. Therefore, the teacher uses this information to tell the story, i.e., story definition and sequence. Because of that, players can feel connected to the characters, characteristics, scenarios and language of the story which the teacher defined using common sense knowledge help. Therefore, there is no intention to teach common sense to the teacher but gives him/her a cultural feedback and help him/her to find out what the students' knowledge is about the stories, facts and actions in order to tell the narrative according to the pedagogical goal proposed. It is necessary to clarify that there is no intention on teaching common sense, once it is a kind of knowledge acquired into the community, informally. Common sense was already proven to be a good way to contextualize the learning action considering the learners' culture and reality.

#### **4. Conclusions**

This paper has described an environment for online collaborative storytelling where the players jointly develop a story under the master's supervision. This game is meant to support a teacher to interact with students which have different social and cultural backgrounds.

Contextteller i.e., storyteller contextualized by Common Sense knowledge proposed here allows children to feel close and to identify themselves with the story. Therefore, players can express themselves through the character in their cultural context. They know and identify meanings through symbolism adopted by the teacher. These symbols can come from common sense knowledge of the children's community to define the character, the objects, in short, the story.

The teacher gets suggestions from the common sense to define the story and its sequence. This game also allows teachers to work with their students in a collaborative way. For example, the master defines a characters' profile that represents their role in the work group. Therefore, during the story, he can consider this profile. For instance, the master asks a specific character a favour and he knows through the profile that character has some difficulties to perform the task. Therefore, he/she can observe how the character solves the problem, either asking others for help or solving it in a different way.

Through common sense the master has contextualized information so that he/she can define and tell the stories with the students' participation. Because of that, students can learn to do anything cooperating with each other. Through Contextteller, students can also learn to express, to help and to be helped because they need to tell their stories, to help their friends to achieve objectives, and to know that they also need aid to achieve their objectives. Finally, the master can observe how the student leads his character to interact with the others.

## References

- Anacleto, J. C.; Lieberman H.; Tsutsumi, M.; Neris, V.P.A.; Carvalho, A.F.P.; Espinosa, J.; Zem-Mascarenhas, S. "Can common sense uncover cultural differences in computer applications?" In: BRAMER, M. (Org.). *Artificial intelligence in theory and practice - WCC 2006*. Berlin: Springer-Verlag, 2006. v.217, p1-10.
- BioWare. "Neverwinter Nights". Disponível em: <http://nwn.bioware.com/>, Julho 2008.
- Bittencourt, R. J.; Giraffa, L. M. M. "A utilização dos Role-Playing Games Digitais no Processo de Ensino-Aprendizagem". Technical Reports Series, Number 031, Setembro 2003.
- Crawford, C. "The Art of Computer Game Design. Washigton State Univarsity". 1982, 90p.
- Diaz-Aguado, M. J. D. "Educação Intercultural e Aprendizagem Cooperativa". Porto: Editora Porto, 2003.
- Fernandes, V. R. "What is RPG?". *RPG - Dragon Magazine in Brazil*, n. 123, 2008.
- Freire, Paulo Reglus Neves. *Pedagogia da autonomia: saberes necessários à prática educativa*. 31 ed. Rio de Janeiro: Paz e Terra, 1996.
- Järvinen, A.; Heliö, S.; Mäyrä, F. "Communication and Community in Digital Entertainment Services. Prestudy Research Report, 2002.
- Lopes, L. M. C.; Klimick, C.; Casanova, M. A. "Relato de uma experiência de Sistema Híbrido no Ensino Fundamental: Projeto Aulativa". *Revista Brasileira de Aprendizagem Aberta e a Distância*, Janeiro 2003, São Paulo.
- Minsky, M: 'The society of mind', Simon & Schuster 1987.
- Oaklander, V. "Windows to Our Children: A Gestalt Therapy Approach to Children and Adolescents". *Gestalt Journal Press*, 1988, 335p.
- Papert, Seymour. *Logo: computadores e educação*. J A Valente (Trad.). SP: Brasiliense, 1985.
- Pastoreau, M. "Dicionário das cores do nosso tempo". Lisboa: Editorial Estampa, 1997, 188p.
- Piaget, J. "Judgement and Reasoning in the Child". Richmond, VA, U.S.A.: Littlefield Adams, 1999, 268p.
- Silva, M. A. R.; Anacleto, J. C. A Narrative Game Culturally Contextualized by Common Sense Modeled as a Semantic Network. In: *WSWed@SBIE – Workshop on Semantic Web and Education*, 2008
- The Education Arcade. "Revolution". Disponível em: <http://www.educationarcade.org/node/357>, Julho 2008.
- Tobaldini, M. A.; Brancher, J. D. "Um RPG Educacional Computadorizado e Missões Contextualizadas com seus Ambientes". In: *Anais do XV Seminário de Computação*, Novembro 2006, pp. 85-96.
- Wertsch, J. V. "Vygotsky and the Social Formation of Mind". 1988.