An Interactive Digital Storytelling to Identify Emotions and Consequences in the Elementary School Child

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Abstract. In this article we focus on children of fifth grade of primary school and how they manage their emotions and feelings in order to improve their social relationships. We conducted a contextual study in order to identify how children interact and discover their social relationships problems. We identify the user profile and propose an interactive storytelling to improve emotional competences and feelings in children. We show a role play story using first-person interaction, and a well-adapted narrative to our users.

Keywords: Digital storytelling · Empathy · Emotions · Interactivity
Moral dilemmas · Conflict resolution

1 Introduction

In recent years, the use of Technological tools has become a social phenomenon. It is common to find a large number of applications and computer programs that facilitate work in all areas. In educational aspects, the applications and resources that we can find are also very remarkable. In this area, the use of technological tools is vital to try to face high rates of school failure and dropout, as well as to respond to the progressive multiculturalism of today's society. Technological tool allows to develop possibilities of methodological innovation that result in the achievement of a more effective and inclusive education.

On the other hand, the need to develop skills to prevent violence and improve school coexistence has led educational institutions to implement national and international programs. Knowing how to solve a conflict, at any educational level, is very important in promoting the development of these skills.

In Mexico some programs are being developed, such as the "Project for School Conviviality" (PACE in Spanish) implemented in primary education since 2015, as well as the attitudinal contents that are addressed in the curriculum of Civic and Ethical content. In this case, the Free Public Text Book and some digital content are supported.

In this study we focus on children at the elementary level, specifically 5th grade. We start from the idea that the forms of interactivity that arise among children of this age can be mediated by a computer agent, educator, family member or other partner, which makes possible the generation of knowledge [1]: they are Forms of learning that

are not necessarily carried out in the classroom and can be presented in settings such as the home or playground where children socialize.

By doing an exploratory and a contextual study, we identified some problems in digital educational materials to strengthen the contents of the subject of Civic and Ethical content, as well as the difficulty of teachers to integrate the existing ones, to the classes.

The objective is, then, to propose an interactive digital story, adapted to the needs of 5th grade students, where they can identify a set of emotions in order to deal with feelings and specially with their consequences in a particular situation. We start from the premise that this will help solve the various common conflicts experienced by children of these ages.

According to this, the second section of this article presents the central concepts on which research is based, relating with emotional competences and empathy. Section 3 the case of study is described; In Sect. 4 we show all the elements of empathy and the storytelling. Then in Sects. 5 and 6 we show the result of the interactive digital storytelling. Finally, a conclusion on the research is carried out in Sect. 7.

2   Emotional Competence and Empathy

Emotional competence, is central to children's ability to interact and form relationships with others [2, 3]. These abilities develop through the lifespan. Preschool and school aged children are becoming adept at several components: (a) awareness of emotional experience, (b) discernment of emotional states; (c) emotion language usage; (d) empathic involvement in others' emotions and (e) awareness that social relationships are in part defined by communication of emotions.

Although often considered from the perspective of individual experience, skills of emotional competence are vividly played out in interaction and within relationships with others; [4, 5].

In the other hand, the ability to care about others and to put oneself in their place is called empathy. Empathy is a learned process and can be successfully modeled in the elementary classroom. Although there are various methods available for improving empathy and other aspects of moral development, one recommended strategy is the use of stories that use moral dilemmas and role-play. This strategy involves (a) the use of formal and informal observations, (b) informal interviews, (c) the choosing of appropriate stories, and (d) large and small group discussions.

When strengthened and acted on, empathy leads to kindness and a caring attitude. When you feel empathy for others, your actions toward them often boomerang back to you. You feel good if you are good to them and, conversely, bad if something hurts them. Adults can support children's empathetic inclinations by letting them know that they are pleased with their sensitivity to others and by assisting and guiding their efforts to give aid [6].

In this article we focus on this empathic involvement and how children live with it. Also we argue that empathy is a very important component in order to improve social relationships among children.

3   Case of Study: Vini-Cubi Elementary School

3.1   Contextual Study

The first step was the identification of the digital content and its relation with the contents of the Free Public Text Book in Ethical content on children attending fifth grade in a public primary in Mexico City. The characteristics of the school that represents the case study are described below.

According to the research objective, we chose a primary school as a case study in the Cuajimalpa area during the period from October 2015 to July 2016. This area was chosen because it is one of the three delegations in Mexico City having the highest percentage of children.

Also, the primary school named "Vini Cubi" (Fig. 1) was chosen for being part of the "Safe School" program, which has as a priority to the Mexico City because is a school that participates in the Digital Inclusion and Literacy Program.

Fig. 1. Vini Cubi elementary school

The following characteristics describe the child population attending the primary school.

- The economic level of families is low; The majority of the children are children of workers' parents.
- The majority of the children are from the suburban area of Mexico City (Napula, Acopilco, Cujimalpa, among others).
- 70% of children are children of single mothers.
- Five children were diagnosed with Asperger's, autism, hemiplegia, having a ADHD (attention-deficit hyperactivity disorder) in the fifth grade group.

In order to draw conclusions about the socio-cultural status and emotional competence of the children, other techniques were applied, which are mentioned below.

3.2   Qualitative Study

Qualitative observation was divided into two steps: non-participant and participant. The first was limited to the process of observation and recording of group dynamics. Subsequently, participant observation was carried out, which consisted in integrating us with the dynamics of learning and socialization of children.

As an example of this, during some classes the teacher indicated to carry out certain activities by groups, to which one of us was integrated by a direct invitation of the children. This integration allowed us to be part of the students' conversations. Also, this integration was extended outside the classroom, since at different times we socialize during break time.

3.3   Non-structured Interviews and Focus Groups

In cases where specific information was needed, non-structured interviews were conducted. In this type of interview, question guides were made with the aim of keeping track of the important information. However, the interviewer was free to improvise issues that might not have been seen at first and that would be enriching for the information they provided. On the other hand, the focus groups had as main objective, to obtain information of the children in a team context.

The focus groups were initiated by dynamics specially designed to work with children, which were applied as an alternative to the questionnaires.

3.4   User Profile Definition

The user profile was defined with the context of children in different aspects. According to information provided by teachers, the academic performance of children is closely related to their family and social environment. In this context we found cases of abandon, and some cases related to drug addiction.

In the academic field the children show a level corresponding to the third grade of primary with a very low academic competence. Regarding their cultural preferences, children listen to "band music", "reggaeton" and "pop and hip hop music". For literary interests, girls prefer proposals like Twilight novels, meanwhile boys prefer some fantasy books.

We also analyses tv shows, "Dragon ball Z" is preferred by boys, and "Monster High" by girls, while "SpongeBob" is a common reference for both genders. Also both, girls and boys, like to play video games and love to download music and be connected on social social networks (Facebook and Snapchat).

In the Fig. 2 we show an infographic that summarizes all this user information. In our case Vini Cubi children.
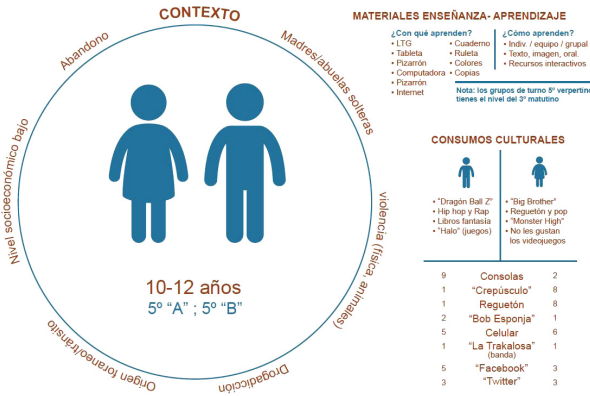
Fig. 2. Infographics showing Vini-Cubi children profile

4 Empathy and Digital Storytelling

Digital storytelling is the art of combining narrative with digital media such as images, sound, and video to create a short story [7]. More than just a simple slideshow of photos set to music, digital stories interweave different media to support the art of telling a tale. In [8] Digital Storytelling Cookbook, the author identifies seven elements that are critical components of effective digital stories. Those elements are:

- Point of view: Outlines the point of the story and the perspective from which the story is told.
- A dramatic question: Sets the tension of the story by identifying issues to be resolved.
- Emotional content: Engages the audience through common emotions and themes (love, pain, humor).
- The gift of your voice: Helps the audience make meaning of images.
- The power of the soundtrack: Sets the mood of the story.
- Economy: Balances the auditory and visual tracks of meaning.
- Pacing: Sustains the attention of the audience by establishing and modifying the rhythm of the story.

While these elements outline the nature of effective digital stories, the process of creating a digital story involves leveraging a wide variety of skills, including researching topics, writing scripts, storyboarding, and assembling the final product using a software [9]. Digital storytelling offers tremendous opportunities for teachers to engage and motivate students. By integrating visual images with written text, digital stories can be used to enhance and accelerate student comprehension, in our case emotional competence [7, 10].

In the other hand, empathy plays a role in order to develop a prosocial behavior in children, and allows a better understanding of social relationships. Empathy is a process which are attributed functions for educational development and the child's

learning with respect to others, discovering some moral actions that improve their ability to solve interpersonal conflicts [11].

According to this, some educational institution considers empathy as a fundamental formative procedure in order to develop social skills in the school, as well as a key element for their civic education. We believe this ability could be used widely to improve Civic and Ethical content in the primary school level.

In order to implement the storytelling, we have used the model of empathy proposed by [12]. This model is composed of three main components incapable of being separated: the cognitive, the affective and the psychomotor (Fig. 3).
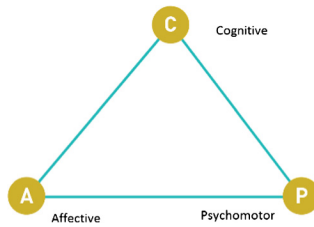
Fig. 3. Model of empath proposed

This model manages the attitude of change and movement of these three components through a learning strategy. Also this model allows to identify the attitude elements in a schematic way, which makes it possible to define some indicators of each components. These indicators are translated in form of verbs that will act in each category. In Fig. 4 we show these components.
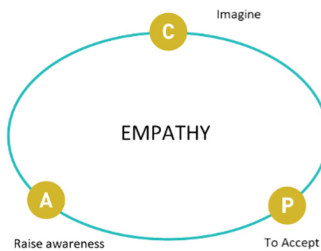
Fig. 4. Empathy model with attitude elements

5   Storyboards and Participative Workshops

For the construction of the prototype, we applied focus groups (4–6 participants) based on the results of qualitative observation. With this approach we obtained important feedback of the prototypes.

5.1   Little Red Riding Hood and Component Exploration

We made a first rapid prototype on paper, where a traditional story the "Little Red Riding Hood" was adapted. We observe that the use of fables in children was very attractive and were very useful to explore some attitude characteristics. Also this story was already used in class to explore some narrative aspects in the class.

The activity included a generic story in whose end the main character accused the wolf of eating her granny. Subsequently, four different stories were narrated from the perspective of one of the characters: the wolf, the Little Red Riding Hood, the granny and the hunter. Each of the participants could choose a character. After reading one of the four stories, three questions were asked about the components of empathy:

- Emotional component: What would you feel if you were (character)?
- Cognitive component: What would you think if you were (character)?
- Psychomotor component: What would you do if you were (character)?

Finally, the children had the option of exchanging characters, as well as constructing an end in a collaborative way to give a possible solution to the conflict in history (Fig. 5).

Fig. 5. First exploratory prototype

In general, after this interaction with the children, it was found that the children did not arrive to manage the conflict in a collaborative way. They do not feel conformable using a character with their opposite sex and it was difficult to appropriate the character.

One of the most relevant findings was that the fiction narrative did not allow us to approach the daily situations of the children, nor to the way in which they could respond and act. In the Fig. 6 we show children interaction facing this paper prototype.

Fig. 6. Children interaction

6   Storytelling Proposal

Taking into account all these findings from previous prototypes, we decided to build the final storytelling. For this story we take into account some characteristics like the use of a digital narrative, the use of first person description. These concepts are explained below.

6.1   Digital Narrative

The starting point was a narrative because during qualitative observation it was detected that this type of practice was used by teachers to teach dilemmas or examples of values and civic practices. So the children were accustomed to these tasks.

By placing the facts in a narrative sequence, every story becomes a sort of allegory with moral significance. And the act of telling a story is "linked to the impulse to moralize reality, that is, to identify it with the social system that is the source of any moral concept that we can imagine" [13].

In addition, interacting with a narrative fiction allows us to learn about our social world and as a result we improve our emphatic behavior [13]. That is why the narrative is taken as a symbolic and immersive value.

6.2   First-Person Interaction

For the final storytelling, we integrated the element of interaction in first person, this concept was taken from the world of video games. In this story, the user has the sensation of being part of the presented story and being able to decide the course of story, thus the user is not a passive observer [14].

According to [14], in this type of interaction the user is seen as a character immersed in the environment, with the ability to respond. The procedure has brought encouraging results in the teaching environment.

We propose that the user have the possibility to make decisions in the course of their interaction with the story, in this way, user experience represents an effective way for the children to be part of the solution created [14].
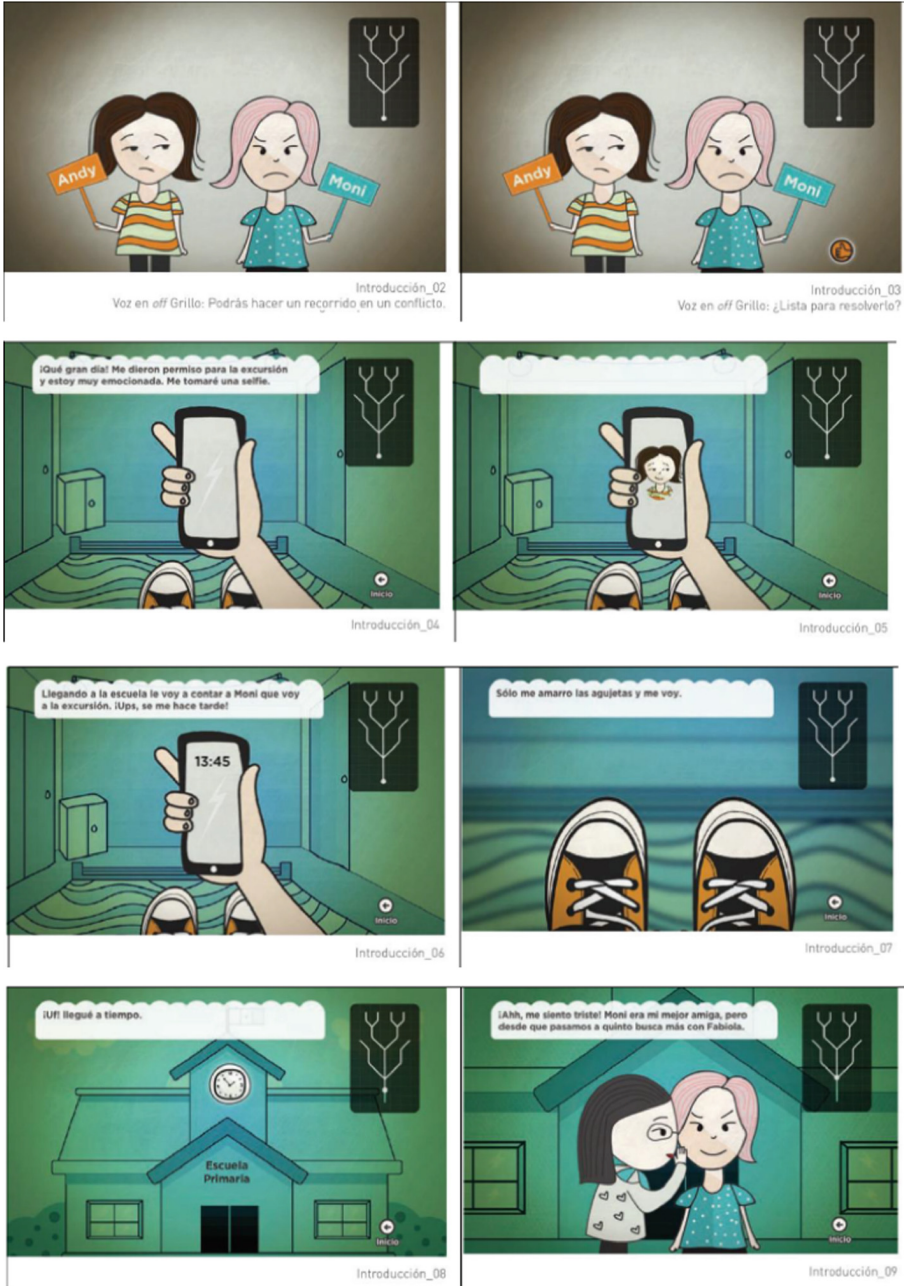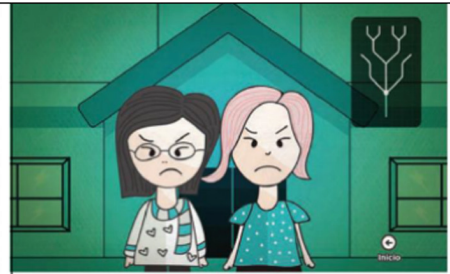
Fig. 7. Final storytelling

Fig. 7. (*continued*)

Camino_01_consecuencia_06
Voz en *off* Profesor: "Me enteré de que algunos
de ustedes han estado peleando;
esos compañeros no irán a la excursió".
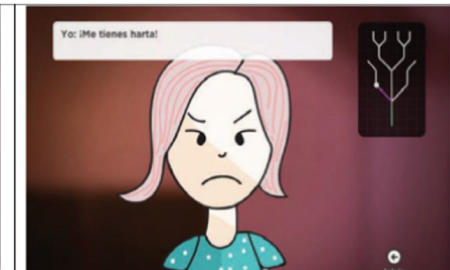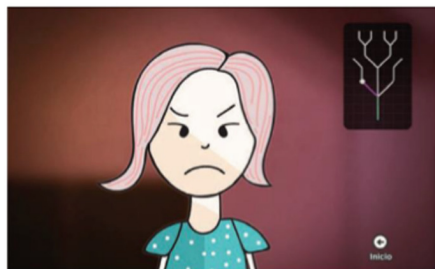
Camino_01_consecuencia_07
Voz en *off* Moni:"¡No profesor, me costó
mucho trabajo convencer a mis papás!"

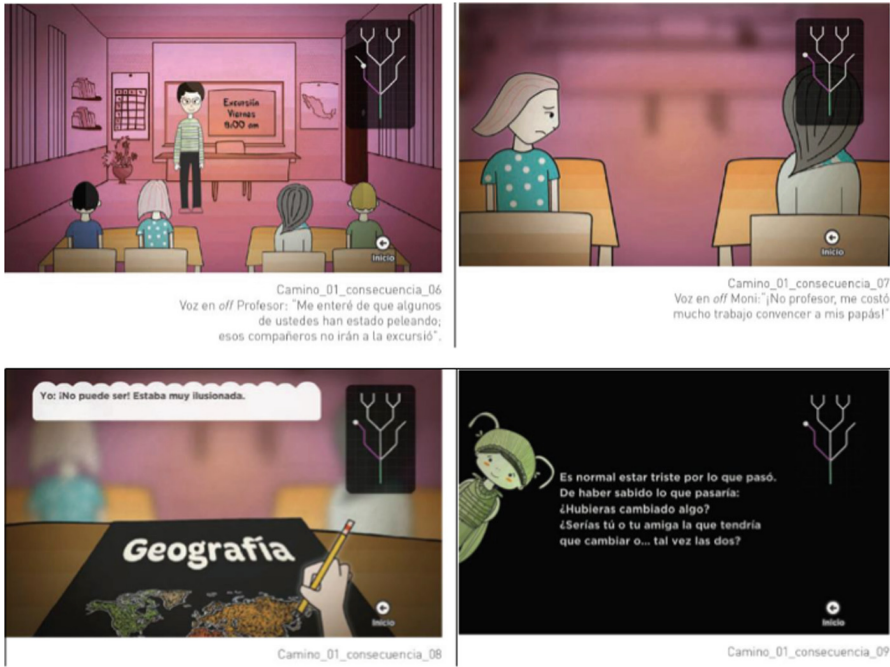Camino_01_consecuencia_08

Camino_01_consecuencia_09

Fig. 7. (*continued*)

6.3   The Final Story

The story focuses on a conflict so that the students identify and choose an emotion, which allows them to decide the next action and thus the course of history. The different consequences of their choice are experimented by children. Finally, some questions are made in order to encourage some reflection on children.

At this point we designed some different options and paths that the story should have. Since history has several possible paths according to the decision making, it was necessary to establish a navigation map and possible routes according to the choice of an emotion. The navigation map has an introduction, a set of events and actions and the consequences associated with each possible exit of the story (Fig. 7).

7   Conclusions

One of the questions that has been formulated throughout this research has been regarding the relevance and functionality of a digital tool to address issues such as the identification of emotions and empathy. These subjects of an attitudinal nature, it seems that it implicitly poses the condition of working through a face-to-face relationship (in this case, between children and teacher) in which corporal expression play's a special roll.

This storytelling recovers the dynamics used in video games and the interaction in first person. These dynamics present children with a situation of conflict in the way of story, in which the participation of children is required to decide the course of events, linking emotion with decision making.

The case study of a public primary school in Mexico City, allowed us to observe the difficulties in incorporating mobile digital devices into classroom. The use of digital and interactive contents, referring to the subject of Civic and Ethical content, allow to identify the needs of children of the use of different tools in order to get specifics curricula elements.

The study of attitudinal content like empathy emotions is crucial in order to prevent school violence. Although the Ministry of Public Education proposes to these attitudinal content as essential elements for coexistence, in the fifth year of primary education these elements are not available. Regarding the relevance of the digital material in this area, we conclude that is not well explored field. The use of simulation games, which come from the culture of video games and allow situations to be created that are close to reality, which in the case of attitudinal contents are important for test some social practices.

Finally, we consider that a digital storytelling, is only one piece in the learning process. Above all, in the type of attitudinal contents that require a progressive advance in order to observe significate changes.

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