EVALUATING A CROSS-CULTURAL CHILDREN'S ONLINE BOOK COMMUNITY: SOCIABILITY, USABILITY, AND CULTURAL EXCHANGE

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Abstract

As an extension of the International Children's Digital Library, the ICDLCommunities project will enable children's communities to develop around the book collection, build tools that allow intercultural communication between children without the use of machine translation, and promote cross-cultural understanding. It will provide a supportive, safe environment for children (aged 7-11) who speak different languages and are from different cultures to come together and use activities related to books in the ICDL to provide common ground. This report presents a review of the research on children, technology, and online communities; describes an evaluation of the prototype activities and tools conducted with children in Argentina and the U.S.; and discusses the lessons learned and their implications on the design of the ICDLCommunities interface.

1. Introduction

The Internet has changed the way we socialize and create communities. With a few clicks of our fingers, not only can we communicate with people who are at the next desk over or in the same town, but also with those who live on the other side of the world. However, though the online world enables us to surmount geographic boundaries, it does not allow us to overcome social and cultural distinctions. Nor should it. But it can facilitate people's knowledge about other cultures. In this digital environment, people can connect with each other more easily and quickly and, if they are open to it, they can gain a better understanding of others and, thereby, ease their own prejudices and intolerance.

In this increasingly globalized world, it is becoming more and more necessary that people be aware of other traditions and beliefs and be more accepting of each other's differences. Even though technology has brought people closer together, it also brings instantaneous reports about various conflicts and acts of aggression grounded in religious and cultural biases. Thus, in order to circumvent these cycles of intolerance, children, in particular, who are prone to absorbing the narrow-minded attitudes of their communities, need to be introduced early on to the diversity of ethnicities and cultures in the world. Among others, two ways to accomplish this are: (i) to have them read children's literature from other cultures, and (ii) to expose them to and have them interact with children from other cultural groups (Webb, 1990; Ohio State University, 2002). The International Digital Children's Library Communities (ICDLCommunities) incorporates these two approaches in creating and supporting digital communities for children.

In creating a successful online community, there are two critical components: sociability and usability (Preece, 2000). Sociability is the meaningfulness or quality of the interaction between community members. Individuals come together and form communities—both physical and virtual—for a variety of reasons; among others, they may want sympathy, need answers to questions and concerns, or have a place of origin, culture, or hobby in common (Maloney-Krichmar & Preece, 2005; Preece 1999). If these communities enable them to make significant connections, people maintain their membership within the group. However, key to creating meaningful interactions is the ability to communicate well and, when dealing with online communities of children, this is a challenge. Kids ages 7-11, for whom the ICDLCommunities is geared, are still in their developmental stages and have limited linguistic and communicative abilities. They are also just learning to socialize and may not be as attuned to the needs and emotions of others (Preece, 1999). Thus, in evaluating the sociability of the system, the standards of quality that are known to be applicable to many adults may need to be reassessed for children.

In online communities, sociability is mediated by technology. The usability of a computer system determines how efficiently and effectively members can communicate and interact with each other. The ideal interface would: enable users to learn to maneuver through it easily, be responsive (i.e., not take a long time in uploading or downloading), and support error-free interactions (Preece et al., 2002). In supporting children's online communities, these factors, as well as their limited motor, technical, and critical thinking skills, have to be taken into account. Thus, designers have to consider the difficulty kids have with using keyboards and mice, their lack of exposure to technology and technical vocabulary, and their limited ability to process or

navigate complex instructions or structures. In addition, they have to keep in mind the children's safety ("Children's Online Privacy Protection Act of 1998") while in this online environment.

The degree of sociability and usability afforded to the group by the attendant system ultimately affects the success of any online community. For the ICDLCommunities project, a third criterion has been added: cross-cultural exchange, or providing an environment in which children can learn about other cultures. As already mentioned, the communication skills of this age group are limited and, when additional languages and foreign cultures are added, this makes sociability extremely complicated. For instance, different cultures do not have the same standards for politeness (De Souza & Preece, 2004; Preece, 2004). We are told that in China, for example, it is not customary to say "please" and "thank you" at the dining table since one is amongst close family members; in the US, this kind of behavior is not deemed acceptable. The interface and the activities, therefore, have to be especially created to be usable regardless of linguistic and cultural differences.

In this paper, we begin with a review of the research on children, technology, and online communities before introducing the ICDLCommunities. We proceed with our evaluation of the prototype activities and tools, beginning with a description of our data collection and analysis methods followed by a discussion of the results. We not only analyze the effectiveness of our methodologies and interface design, but we also discuss our findings on the ways children liked to work, think, and communicate with each other. In this study, culture and identity emerged as noteworthy issues for the kids involved. We conclude with a recapitulation of the lessons learned and the recommended modifications to the interface.

2. Children, Technology, and Online Communities

Computer technology has drastically changed the way people access and use information. Numerous researchers have conducted studies to discover usage patterns and improve access to services. However, an overwhelming majority of these inquiries have focused on the needs of adults. It has only been in the last decade or so that a few scholars have begun to look at children's digital needs and use. Research on children and technology gives insight into the ways children view and use technology and their desire to be consulted in the development of resources and services intended for them, particularly since they think differently from the adults who design these systems (Druin, 2002). The discussion on children and online communities demonstrate the need for a cross-cultural children's online community and the important issues to be considered in creating one.

2.1 Children and Technology

Many of today's children and youth use digital tools and information regularly in their lives (Center for Media Education, 2001; Howe & Strauss, 2000; Levin & Arafeh, 2002; Manuel, 2002; Neuman, 2003; Soloway, 1991; Walter 2001). Studies reveal that they view technology positively and often use it to forge their identities (Center for Media Education, 2001; Howe & Straus, 2000; Jonassen et al., 1999; Manuel, 2002, Soloway, 1991; Walter 2001). However, when developing new technologies for them, adults tend to overlook them and their ideas (Dresang et al., 2003; Dresang & Gross, 2001). Young people are rarely consulted about their

needs or wants when, in fact, recent research indicate that they want to have a say (Douglas, 2002; Meyer, 1999; McIntyre, 2002).

One of the areas that need immediate attention is the development of appropriate tools that enables children to access and use digital materials (Borgman et al., 1995; Cooper, 2002a; Moore & St. George, 1991; Solomon, 1993). Interfaces have to consider children's cognitive abilities, instead of forcing them to navigate through complicated, adult-level concepts and technologies (Bilal 2002). Also, designers have to take into account the varying developmental levels of children and youth; younger children, especially non-readers or beginning readers, for example, rely on visual and auditory cues, rather than on textual directions (Cooper, 2002b).

Children and adults do not only differ in their comprehension levels, but they also diverge drastically in the way they think about things (Cary, 1985; Cooper, 2002a; Cooper, 2002b; Markman & Hutchinson, 1984; Siegler, 1996; Siegler, 1998). Research on children's classification behavior, for instance, reveal that children do not differentiate fiction from non-fiction (Cooper, 2002a; Pejtersen, 1992); instead, they prefer to use such categories as gross stuff, scary stuff, and jokes and cartoons (Bilal, 2002; Busey & Doerr, 1993).

Young people also have specific needs when it comes to applications intended for them. Some researchers are working with children to design online search engines, metadata, and digital library applications, and these studies demonstrate that young people are very concerned with (i) customization and (ii) visualization of tools and materials (Druin, in press). For instance, children want to have a choice in how they search; they want to be able to type in keywords, as well as click on visual icons (Large et al, 2002). They also want to be able to modify the colors and graphics of the interface (Bilal, 2002; Druin et al, 2001; Large et al, 2002).

2.2 Children and Online Communities

There is a small but growing number of online communities for children despite the challenges of ensuring safe interaction for children online. Many of the communities that are available tend only to allow one-way posting to family and friends and sometimes voting to rank contributions, e.g., PBS's Backyard Jungle (www.backyardjungle.org), a community for children interested in nature, Cartoon Network (www.cartoonnetwork.com), and Disney's Surf Swell Island (www.surfswellisland.com). One site, Habbo Hotel (www.habbohotel.com), does allow 13-18 year olds to "hang out and make new friends"; in this virtual hotel, teens can register to "become" Habbos, explore the various rooms and activities, and chat with existing friends or new people. Classroom-based community activity can be more imaginative because the online environment can be controlled; for example, Ellis and Bruckman's (2001, 2002) Palaver Tree encourages children to learn history by communicating with seniors who have lived through the experience.

Currently there appear to be few international online communities that engage children who speak different languages and come from different cultures. Experience from research with adult communities suggests a need for attention to the following social issues in developing new communities: (i) encouraging cooperation and collaboration (Kollock & Smith, 1996); (ii) managing competition (Kollock, 1998); (iii) supporting development of trust and empathy

(Preece, 1999; Maloney-Krichmar & Preece, 2005); (iv) supporting individual and group identity; (v) ensuring privacy when appropriate (Preece, 1999); (vi) ensuring non-aggressive interaction (Collins & Berge, 1997); (vii) supporting social awareness so that participants know who else is present and the kind of activities in which they are engaged (Erickson et al, 2002; Donath, 2002); (viii) managing participation, including non-participation, i.e., lurking (Nonnecke & Preece, 2000); and (ix) encouraging a sense of purpose and fulfillment among participants (Preece, 2000).

Many of the issues in adult communities are important in the design of children's technology. Druin, for example, advocates that children's software should promote social engagement, offer suitable challenges, and enable children to be in control of their own learning (Druin, 1996; Druin et al., 1999; Druin & Inkpen, 2001). Her research with children suggests "…the need to create learning opportunities that support the 'messiness' of being a child, the interactive nature of children's questioning and exploration, and the need for children to express and construct their own paths to knowledge individually or with others" (Druin & Inkpen, 2001, p.4).

2.3 Relationship to Existing Literature

The existing literature on children, technology, and online communities indicates that more attention should be focused on the digital needs of children and youth. The findings on children and technology show that most current technology is not specifically designed for the developmental and cognitive abilities and preferences of children and youth. The section on children and online communities highlights the need for the formation of more interactive communities for children, using social rules that are more child-oriented. In designing cross-cultural online communities for children, the ICDLCommunities team is combining the usability and sociability lessons learned from previous studies and applying them to a cross-cultural environment. In conducting evaluations of its prototype activities and tools, it adds significantly not only to the literature on children's digital uses and needs and children's cross-cultural computer-mediated communication but also to the research that actively includes children in technology design and involves them as partners.

3. The International Children's Digital Library Communities

3.1 The International Children's Digital Library

The International Children's Digital Library (ICDL) (www.icdlbooks.org) is a multicultural, multilingual online archive of literature for children ages three to thirteen. It contains materials that expose children to new ideas and teach them about the world around them, especially similarities and differences in cultures, lifestyles, and priorities. Its goal is to have 10,000 books featuring 100 different languages in its collection. The ICDL is an ongoing project of the University of Maryland's Human-Computer Interaction Laboratory. Its design team, which is comprised of specialists from information studies, computer science, education, art, and psychology, as well as kid partners (KidsTeam), is experimenting with interface design, book digitalization techniques, and storage, retrieval, annotation and delivery technologies.

Figure 1. The International Digital Children's Library home page

In order to ensure the appropriateness of the design and technology for its young users, the ICDL utilizes cooperative inquiry, an intergenerational, participatory method that strongly involves children (ages 7-11) and their teachers in the technology development process (Druin, in press). One of the most significant aspects of ICDL is the classification of its materials, which is very different from traditional cataloging. This is based on studies, which showed that children look for books in unusual ways (Bilal, 2002; Busey & Doerr, 1993; Campbell et al., 1988; Cooper, 2002a; Pejtersen, 1986; Wendelin & Zinck, 1983), as well as on the team's own research and the input of its kid partners. There are three ways a user can search for books from the main page (see Figure 1); in addition to a keyword search, s/he can search by location (materials about, from, or set in a certain country or region) and by categories (see Figures 2 and 3). Under the categories search, which may be performed in simple or advanced mode, the books are grouped according to the ways that children might look for them. This includes traditional categories, such as subject, genre, and publication date, and novel categories, such as setting, characters, true vs. make believe, color of book cover, shape, and the way a book makes one feel.

Figure 2. ICDL Location Search

Figure 3. ICDL Categories (Simple) Search

3.2 The International Children's Digital Communities

As an extension of the ICDL, the ICDLCommunities project will enable children's communities to develop around the book collection, build tools that allow intercultural communication between children without the use of machine translation, and promote cross-cultural understanding. It will provide a supportive, safe environment for children (aged 7-11) who speak different languages and are from different cultures to come together and use activities related to books in the ICDL to provide common ground. In ICDLCommunities, children will be able to generate personal profiles using drawings and photographs. They will read books in their own language from ICDL's collection. They will then be able to create new stories, using images from the books, as well as elements they have created using the drawing and language tools. They will share these stories with children from other countries and ask questions about the stories they receive. Iterative communication among the children will take place to clarify the meaning of stories, as well as to allow them to get to know each other. Teachers and parents can aid them in these activities.

The tools and processes for ICDLCommunities are currently in development. Also employing the cooperative inquiry method, the team is working with kid partners to gather field data, initiate ideas, and test and develop new prototypes. Currently, the team is developing two components: the Story Maker and the Communications Area. The Story Maker allows children to create new endings to existing books in the ICDL, while the Communications Area allows users to read stories created or revised by other children and exchange questions and answers about the stories. Because children may have difficulty reading, writing, or typing, it is important that they be able to communicate visually in this environment. Consequently, the team has created and continues to explore prototype tools that enable children to make their own

drawings, develop picture dictionaries, and exchange messages (mostly in the form of drawings or drawings that have been labelled).

3.3 Preliminary Evaluation: United States and Hungary

In addition to several design sessions with the KidsTeam, in which the children provided ideas and feedback on the interfaces and activities, the ICDLCommunities team carried out a preliminary evaluation to observe and begin to learn about how children from different countries communicate with each other without speaking each others' languages. In May 2004, seven Hungarian children (four boys, three girls, age 8) participated in a two-hour session, in which they created new stories for the KidsTeam in the United States. They produced the stories using drawings, pictures from cheap paper books, and words (see Figure 4). They also interpreted the stories created by the American children and asked questions about them. The American KidsTeam had several meetings during which they created their stories and interpreted those from the Hungarian kids.

Figure 4. Making stories in Hungary

The children in both countries were thrilled about connecting with kids from another country. They asked questions about the other kids and wanted to exchange photographs. They appreciated the communicative value of the stories—the fact that they were created and sent by kids from a different continent and the fact that they could send messages and morals with their pictures. However, while the kids could easily invent new stories orally and enjoyed drawing in general, they had difficulties conveying in their pictures the actions and transitions, as well as emotions, in their stories. They also felt unsure about how to create stories that those who do not speak their language can understand. Interpreting and asking questions about the stories from the other kids proved to be the most challenging of the activities. While they could identify most of the images represented, they could not decipher the meaning of the whole story. Interestingly, the two groups came up with different types of questions for each other. While the Hungarian kids were interested in the emotional state of the characters (sad, happy), the relationship between the characters (friends vs. enemies), and values (good vs. bad), the American kids were more concerned with clarifying the characters and (Who is this guy? Is this the same dog as the one in the house?) and the plot (Is the green dog sick? Is he killing the puppy?)

4. Evaluation Activities

In order to build on the findings from the preliminary evaluation with the Hungarian kids and KidsTeam and to further assess the book-related activities, as well as to test prototype tools and cultural attitude questionnaires developed so far, the ICDLCommunities team conducted lengthier and more detailed pilot sessions in November-December 2004. Carried out with different sets of kids, this evaluation was held in the following locations: Buenos Aires, Argentina and Baltimore, Maryland. Its goal was to examine an extended series of four activities: (i) Getting to Know Each Other; (ii) Reading Stories and Creating New Endings; (iii) Interpreting Each Other's Stories; and (iv) Asking and Answering Questions about Each Other's Stories.

In this evaluation, the ICDLCommunities team employed the ethnographic approach, which relies on primary data collected from the field through observation and recording the participants' actions, words, and expressions as well as through interviews and interactions with them (Fetterman, 1998; Wolcott, 1999). This method has several advantages. Unlike paper-based or other non-face-to-face approaches (e.g., written surveys or questionnaires, journal-keeping, pure observation), researchers can, with this technique, personally witness the participants' actions and reactions, instead of depending on written responses that may be incomplete due to the participants' editing of what they write or deficiencies in their recall or expressive abilities. They can note bodily and facial expressions that are just as important as words, but which are absent through other methodologies. They can also request clarification on comments or replies, as well as ask follow-up questions. The ethnographic approach is particularly appropriate for use with young children because they are limited in their communicative skills and adopt different communication styles from adults.

At the two sites, the researchers observed the children and took notes throughout the sessions. They also videotaped some of the activities, as well as solicited the kids' input on the various stages of the process. In addition to the primary activities, they also conducted demographic and cultural attitudes interviews, which were audio-recorded. The researchers then analyzed the notes, recording transcripts, and audio and video data, paying particular attention to the kids' behaviors and preferences. They identified key issues under which to make recommendations for the book-related activities and the design of the software tools.

Six children (three boys, three girls, ages 7-9) participated in Argentina and eight (four boys, four girls, age 8) in Baltimore. In Argentina, the children met for three hours a day over six consecutive weekdays. Since this was during their summer vacation, they came to school especially for these sessions. In Baltimore, the children came together four times, one hour each spread out over eight days. They stayed after regular school hours for these activities. Two researchers were present in both locations, with occasional help from the kids' teachers in the U.S.

All the Argentinean children were experienced users of desktop PCs, having played with computer games and on kids' websites (e.g., cartoonnetwork.com). They were fairly skillful with a mouse, but were not too capable with a keyboard. About half the Baltimore children had computers at home and all seemed comfortable with drawing programs and games. None of the children had user interface design or evaluation experience. The children in both countries had very limited familiarity with the language of the other country, mostly consisting of vocabulary and basic conversational phrases.

Getting to Know Each Other

The Argentinean kids all attended the same school, but they were not in the same classes. The American children did not know each other across genders; the boys were from one school, while the girls were from another. Thus, in order to begin to develop group camaraderie and help the kids become comfortable with the researchers, the first activity in both countries was

introductions. In Baltimore, the kids went in turns and said their names and their favorite activities. In Buenos Aires, the children said their names, ages, and favorite toys.

Because the kids in Argentina met a couple of days earlier and had more session time than the American kids, they were also able to create paper-based introductions for the kids in Baltimore. Using markers, they drew their favorite toy on a big piece of paper, and digital pictures of these posters were taken. Upon the kids' requests, the pictures showed them holding up their posters (see Figure 5). The children were also asked if they had any questions for the Baltimore kids; they came up with approximately 40. In the US, one of the researchers took a map of the world

Figure 5. Argentinean kids with their introductory posters

and pointed out to the kids where Argentina is located. She then introduced the Argentinean kids through the pictures and descriptions sent by her colleague in Argentina. After the introductions, the American kids did not have questions about the Argentinean kids, but they identified with those with whom they found things in common (e.g., soccer or PlayStation).

Reading Stories and Creating New Endings

For the principal activities of the evaluation, two books were selected from the ICDL. Both are bilingual (English/Spanish), around 30 pages in length, feature plenty of pictures, and only contain brief text on each page. *Prietita and the Ghost Woman (Prietita y la Llorona)*, written by Gloria Anzaldúa and illustrated by Maya Christina González, is the story of a little girl who goes in search of a healing plant for her ailing mother, encounters la Llorona, and grows up in the process (see Figure 6). *The Harvest Birds (Los Pájaros de la Cosecha)*, written by Blanca López de Mariscal and illustrated by Enrique Flores, is about a young man who is determined to become a farmer and becomes a successful one with the help and advice of his feathery friends (see Figure 7).

Figure 6. Cover for Prietita and the Ghost Woman

Figure 7. Cover for Harvest Birds

Both books were read to the two groups and, to ensure that they understood the stories, they were asked to do a brief retelling. Because they had more time, the Argentinean kids read their story in both languages, with one of the researchers reading in English. The purpose of doing this was to enable the kids to learn some vocabulary from the other kids' language, as well as to give them a sense of what the reading activity was like for the remote group. The kids were then asked to create alternative conclusions to one of the stories. The kids in Argentina invented endings for *Prietita and the Ghost Woman*, while those in the US did *The Harvest Birds*. The Argentinean kids had been introduced previously to the notion of inventing new endings, since one of their extra activities was to act out a traditional story, first with its original ending and then with a revised one.

In Argentina, the entire group first sat around and told their ideas for new endings in turns. They were then invited, but not obliged, to form groups to create the endings; all but two boys preferred to work by themselves. They were not instructed on how to do this and, at first, most

of them drew pictures that were not related to the story and had to be reminded of their task. The kids in Baltimore were divided into three groups, though there was a strong resistance to group work from the boys. Initially, members of each group drew pictures individually before they were prompted by the researchers to talk to each other and agree on a new ending. Some of the kids had their own full stories and did not want to combine them with the ideas from the others in the group. The children in both countries depicted their new endings with both images and words on paper, using markers, crayons, or cut-and-pasted figures from photocopied pages of the books. The new endings were then digitally photographed and sent to the researchers on the other site.

Interpreting Each Other's Stories

At their next sessions, the kids in both countries read the other group's story, but only up to a cut-off point. They then saw the endings created by the remote group and were asked to interpret them. In Baltimore, the pictures were printed out with a color printer and passed around to the kids. However, because of the prohibitive cost of printing in Argentina, the drawings were shown to the kids using Tablet PCs and an image viewer. The Argentinean kids, as a whole, looked at and discussed the three endings from the American kids (see Figures 8-10 for one of the endings). The kids in Baltimore were divided into the same groups in which they had previously worked. They were briefly shown the five endings created by the Argentinean kids and were asked to pick one to interpret. The three groups picked the two images that had the kids holding up their endings. The bilingual adults translated the English words on the American kids' pictures for the Argentinean kids. In the US, the adults assisted the kids in translating the Spanish words using a Spanish-English dictionary. The Argentinean kids could not make too much sense of the American kids' stories, while the American kids made some good guesses.

Figures 8-10. A series of three pictures, depicting a new story ending created by one of the U.S. groups

Asking and Answering Questions about Each Other's Stories

After trying to decipher the meanings of the story endings created by those from the other country, the kids came up with questions about the illustrations (see Figures 11 and 12). They did this by using four specially-designed question templates that were first used with the KidsTeam in the Hungary-US evaluation. These templates helped to structure and assist the kids in this activity. Designed to allow the kids to ask questions without using natural language, the templates ask the following questions: "What is [this image]?"; "Is [the image] this or that?" (see Figure 12); "What is the relationship between [one image] and [another image]?"; and "[When, Where, How, Why] did the [subject] [verb] [object]?" The American kids understood two of the "what is" and "relationship" templates, but had difficulties with the other two. They were able to ask some of their questions using the templates, but not all. The Argentinean kids did not understand any of the templates and needed much guidance from the adults in using them.

Figure 11. Question for Figure 8:
What is the name of this person?

Figure 12. Question for Figure 9:
Are these clouds or fields?

Most of the kids in Baltimore cut out pictures from the other kids' stories to create their questions, but one boy wrote his question directly on the illustration. The kids in Buenos Aires superimposed their questions on the templates and images on the Tablet PCs. Some of the questions that surfaced were: What is this thing? Who is this person? What is s/he doing? Do they love or hate each other?

The questions were then digitally photographed and sent to the researchers in the other site. Each kid or group of kids received the questions to their ending and were assisted by the researchers in interpreting and answering them. The researchers explained what each template meant and helped in translating the words. The responses were photographed and sent back. In some cases, there were additional clarification questions but, due to the limited time frame of the sessions, these were only expressed orally.

Interviews with the children

In addition to the four primary activities, the researchers also conducted interviews with the children using two prototype questionnaires. These interviews focused on the children's demographics, including their online experiences, and cultural attitudes, including their knowledge about other cultures, particularly that of the remote group.. The kids were questioned individually and away from the rest of the group. In addition to their names and ages, they were asked how often they go online to surf, e-mail, and chat. They were also asked if they have travelled to other countries and what they knew about Hungary and the country of the remote group. The interviews lasted no more than five minutes.

5. Discussion

These sessions confirmed many of the findings from the Hungary-US test, as well as provided some new insights. The children enjoyed the activities very much, particularly communication and drawing. They were fascinated with the idea of talking with and learning about kids from another country (i.e., sociability and cross-cultural exchange). They were also interested in finding out about the other kids' country and language (i.e., cross-cultural exchange). They, however, had difficulties with the story creation and picture interpretation activities (i.e., usability).

5.1 Sociability: Team Building, Social Aspects, and Identity

One of the goals of ICDLCommunities is to enable teachers to use the technology in schools and other similar environments and use it to teach their children to communicate with other children, including those from other cultures. In such a setting, it is important that the children be comfortable with each other and be able to work together. Thus, before any collaboration can happen, there must be some team building activities. In these sessions, the children in each

country did not necessarily know each other beforehand; in fact, the kids in Baltimore were from two different schools. The introductory activity was not sufficient to create a rapport between the kids in each group. This made it difficult when they were asked to work in teams, and they needed to be prompted several times before they would work together. There needed to be additional activities focused on team building over a longer period of time.

Because of their shorter attention spans, it was challenging keeping the children focused on their tasks. Though they were enjoying themselves, they often quickly forgot that they were supposed to be doing a group activity. In most cases, only one or two of the kids would make the effort to accomplish the work, while the rest played alone or with the other kids. Additional teachers and researchers would have facilitated the process.

According to the research, sociability is an integral aspect of online communities (Preece, 2000). In these sessions, the kids were meeting new people, not only in terms of some of their group members but especially the kids from the other country. The researchers in Baltimore simulated the process of getting to know others by showing pictures of the Argentinean kids and giving some information about them. The American kids very much enjoyed seeing the pictures of the Argentinean kids. They liked learning about the favorite toys or games of the other kids, and they were especially attracted to the kids with whom they had something in common. The Argentinean kids were at a disadvantage because, due to the time constraints of the kids in Baltimore, they did not get the opportunity to see pictures of and learn about their American counterparts. They wanted to see photographs of the American kids with their families and pets, as well as those that show their games or what they do for fun. Though they did get to come up with a list of questions for the American kids, there was also insufficient time to get them answered. There should be more time dedicated to allowing the kids to get to know and exchange information about each other.

As the sessions progressed, the children could not remember the kids in the other country, even the ones in Baltimore who saw the pictures of the Argentineans. In the story creation activities, they often forgot that they were trying to tell the stories to kids in the remote group. Clearly, they needed to be able to visualize the other kids. This was reinforced by the fact that, when the American kids had to select story endings to interpret, they picked the ones where the Argentinean kids were included in the pictures (see Figures 13 and 14). It would be more helpful to have pictures of all the kids from the country, keep them somewhere visible during the entire process, and attach them to the appropriate illustrations.

Figures 13 and 14. Two Argentinean girls holding their story endings.

In addition to the importance of learning more about the others, the kids also had the overt need to express their own identities and cultures. They liked showing pictures of themselves to the other kids and enjoyed sharing information about themselves and their lives. When a video camera was set up in Argentina to record the proceedings, the kids immediately stood in front of the camera and talked about themselves. Similarly, American kids, without prompting, began to introduce themselves and send messages to the Argentinean kids. They also began showing various personal objects on camera; for instance, they explained the characters and the English

words on their juice boxes. The children should have as many chances as possible to share images of and information about themselves through all available media.

The importance of communication between the kids was very apparent. Both in Argentina and the U.S., the kids were excited about getting to know their counterparts in the other country, as well as having those kids learn about them. This opportunity motivated them to participate in the more challenging story-related tasks. Like the kids in the Hungary-US evaluation, these kids delighted in exchanging pictures, personal information, and messages. They were more interested in the other kids when they could visualize them and knew something about them. They seemed to relate to those with whom they shared things in common. This proclivity for sociability should definitely be encouraged with as much time and in as many ways as is feasible.

5.2 Usability: Story Reading & Creation, Picture Interpretation, and Questions & Answers

Since ICDLCommunities is an extension of ICDL, it is only logical that social interactions among its members would revolve around the books in the collection. In this evaluation, story reading was the starting point for story-related communication between the kids in the two countries. There were a couple of problems with this step. The kids in Argentina were impatient or confused by the bilingual reading of the first story. It also took a long time to read the story in this way. This method demanded too much of the kids, and the reading went better with the second story, which was only read in Spanish. The kids in the U.S., on the other hand, were somewhat bored by *The Harvest Birds*, the story assigned to them. As the basis for the more challenging activities, story reading should be kept as simple and fun as possible. An entertaining book should be selected, and its reading should be kept uncomplicated and pleasurable for the kids.

In the story creation, one of the challenges was the kids' opposition to changing the story endings. For instance, when the Argentinean kids were first introduced to the idea via an acting activity, they initially did not want to change the conclusion because, according to them, "No, THE story is not like THAT." It was only after much persuasion that they quickly invented new endings. While this resistance indicates a respect for the original stories, facilitators should explain to the kids beforehand the purpose of the activity and provide instructions and examples.

Once they got used to the idea of story creation and were working in groups, some kids were reticent about sharing their ideas, while others did not want to combine their stories with those of other members in their group. While communicating ideas with the group is the ideal way to create consensus, this might only work for the outgoing kids; the shy ones may need additional time to formulate and share their stories. When it came to drawing their new endings, the kids found it difficult to "make a story" on paper. While they loved drawing, they preferred to draw static pictures, instead of trying to create a picture that depicts a series of actions or events. Initially, these pictures had few or no references to actions, emotions, or relationships; some indications of these were added upon the suggestion of the researchers. Again, the kids should be provided with instructions on and examples of storytelling through pictures. A story structure template, with spaces for sequencing, would be very helpful. Both in story sharing and drawing, the kids should be given individual, as well as cooperative, time.

Interpreting the pictures sent by the other kids proved to be quite challenging. The children had a difficult time trying to figure out the images, not only because of the quality of the drawings but also due to unfamiliarity with cultural objects and representations. The Argentinean kids, in particular, were confused about why they were doing this activity; they had to be reminded that the American kids created these stories. They needed help from the adults in beginning the guessing process. The children in both countries had more trouble deciphering the pictures that featured drawings (see Figures 8, 9, 13, and 14); they had a much easier time when the other kids cut out pictures from the original story (see Figures 10 and 15). When the kids provided accompanying text on their pictures, the other group also had problems reading the handwriting. In order to make this activity easier, images from the original story should be used. They should also be labelled, especially the ones that are hand-drawn. The adults should assist the kids in interpreting. However, it is also important to remember that kids like to draw so opportunities for making their own drawings need to continue to be provided.

Figure 15. Ending by American kids.

Figure 16. Question for Figure 14: Are Prietita and La Llorona enemies or friends?

Asking questions about the new story endings was also tricky. Because they could not figure out the images in the first place, the Argentineans had a hard time coming up with questions. They also had difficulty understanding the question templates. American kids had an easier time using some of the templates. However, they could not comprehend why they could not call the Spanish teacher over from the next room to just translate their questions. Many of the kids in both countries were not interested in linear storytelling; instead, they wanted to express and know more about the emotions and relationships between the story characters (e.g., Do they like or hate each other? Are they enemies or friends?) (see Figures 16 and 17). These kinds of questions were not possible through the templates. In order to be more helpful to the kids, the adults should be trained on this activity, particularly in the use of the question templates. Additional templates need to be created to represent emotional relationships. Another useful template could be a confirmation template (e.g., “Is this man Juan?”)

The children also had an even more challenging time with the question interpretation. Just like the story interpretation, they had trouble with the process and were sometimes bored by it. For the kids in Baltimore, a major problem was in figuring out which parts of the drawings represented segments of the children’s own story endings (and redrawn by the Argentinean kids) and which parts represented the questions (see Figure 11). As in the story interpretation, they had trouble reading the kids’ handwriting, especially when the words were broken up or not written neatly in a line. In order to minimize the confusion between images from the story endings and new images, the kids suggested that a better solution would be to cut out and use the images from the story ending in asking the questions (see Figure 17).

Some of the answers were much harder to draw than the original story endings because the questions asked required answers with concepts that were more complicated to convey. For instance,

Q: Why did he have a hat?
A: He just had a hat because it was in the story.

or

Q: Why did he plant so many seeds?
A: Because he wanted to fill his field.

In many cases, they wrote out their answers instead of drawing them. Other questions could be answered by confirmation (see Figure 18). The kids had the easiest time with the multiple-choice questions; they liked being able to simply circle the correct option. In Argentina, only one child enjoyed this activity; he offered to answer the questions for the kids who were not present. In order to make question answering easier, it would be best to provide choices. It might be better to leave this activity to the kids who liked responding to the questions.

Figure 17. Question for Figure 13: Does Prietita love La Llorona.

Figure 18. Answer to Figure 17: Prietita loves La Llorona.

The difficulties in depicting and interpreting new story endings and asking questions about them reflect the results from the Hungary-US test. The drawing of questions and answers, and the use of templates were specific to these sessions. These new activities were just as problematic. Though the templates helped somewhat, the kids needed explanation in using them. The children also came up with questions, some of which were similar types to those asked by the kids in the previous evaluation, that could not be asked using the templates. Clearly, these findings need to be taken into consideration in the interface development, in order to improve greatly its usability.

5.3 Cross-Cultural Exchange: Interviews and Observations

As discussed in Section 5.1, the kids in both countries enjoyed being able to communicate with kids in the other countries. However, does this exchange foster learning about other cultures? The cultural attitudes questionnaire that was tested in this evaluation is designed to measure changes in knowledge and perceptions about other cultures. Ideally, the kids would be asked the same questions at the beginning and at the end of the activities. In this evaluation, the researchers only interviewed the kids once. They were trying out the appropriateness of the questions and to begin to understand what kids know and how kids think about other cultures. The responses indicate that most of the kids have had no experience of travelling to other countries nor do they seem to know much about the location and cultures of other countries.

The kids, however, showed an obvious interest in knowing about the other kids' cultures and sharing their own. They not only asked the researchers about the other kids but, when the opportunity presented itself with the videocameras, they showed objects that are closely tied to their personal identities or culturally- or linguistically-specific. The kids enjoyed looking up on the map the countries and cities where the other kids lived. They also liked speaking in or learning about the other kids' language. In some of the activities, for instance, some Argentinean kids used English words in their pictures or responses (see Figures 11 and 18). Also, many of the questions that surfaced were actually related to the words (see Figures 19 and 20). More evaluation needs to be done on the extent of the cross-cultural exchange and learning in these activities.

Figure 19. Question for Figure 15: What is "grow crops"? From which part of the book is it?

Figure 20: Question for Figure 13: What do the words "es boquar" and "estaba perdidas" mean?

6. Conclusion: Lessons Learned

These pilot sessions provided the ICDLCommunities team with feedback about the planned book-related activities, tools, and questionnaires. As discussed in section 5, the team learned the following lessons about the activities:

- More team building.
- Allow kids to share images of and information about themselves in all available media.
- Provide instructions and examples for story creation, interpretation, and question and answering.
- Provide both individual and collaborative time.
- Use images from the books, rather than drawings. Label images.
- Provide training for the adult facilitators.

However, these paper-based activities are merely precursors, which need to be translated into computer-based activities for the online ICDLCommunities. These sessions provided directions for modifications to the design of the prototype tools. These are the recommendations for the interface:

1. *Provide spaces for sharing images*. The kids liked sharing pictures of themselves, their things and their work. The interface should provide a space, where the kids can provide a "permanent" representation of themselves or things that are important to them. There could also then be a separate space, where they can continually change the pictures. The first picture provides continuity and reminds the other kids with whom they are corresponding, while the second space allows the kids to share additional pictographic information. This exchange of pictures can create closer links between the members of the online communities.

2. *Provide more support for storymaking*. The children enjoyed creating new endings for stories, but it was challenging for them to recreate these in multiple drawings. It would be

useful to have a story structure template or other scaffolding. Another important aspect for the children was to be able to express the emotions and relationships among the characters in the stories more easily. A simpler interface could be used for storytelling that focuses less on the details of how things look and more on the ideas, events, and the flow of the story.

3. *Create additional question templates.* Some of the existing templates were useful, but they did not cover the gamut of questions asked by the kids. New templates should be created to assist in asking the more popular questions, such as emotional relationships and clarification.

4. *Provide a useful dictionary, which allows the kids to look up words in the ways that they are comfortable*. The children in both countries liked communicating in the other kids' language. They liked it when they could understand words in the other language. They also enjoyed using the dictionary. However, the kids in Baltimore had two problems with the dictionary. They could not understand the concept of looking up words alphabetically, and they could not understand the difference between Spanish-English and English-Spanish sections of the dictionary. A review of existing literature should be conducted, in order to understand the ways that kids look up words or concepts. Just as the ICDL created new metadata categories, the dictionary for ICDLCommunities may have to come up with new ways of finding words.

Working with cross-cultural groups of kids has many challenges. The age and developmental skills of this population makes it challenging to explain processes and achieve results. The lack of communication and sociability skills, compounded by differing languages, also makes the creation of online communities quite problematic. However, these pilot sessions have revealed several lessons about the ways children work and think, and these have been useful in improving the design of the ICDLCommunities interface.

Since the sessions, the team has been working to incorporate the above recommendations into the design of the system. Already, it is possible to "cut out" images from the original stories into the empty pages (for new endings). There is also a labelling function for free-form drawings. The team has also come up with a few ways to look up new words and concepts. In a few months, a workable prototype will be available, and kids will once again test its usability.

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