

What Happens When There is Research Funding for New Technologies for Children?

The Where...

People often ask me-- Where are people really being funded to make new technologies for children? What they're referring to is that (at least in the United States) there is an awful lot of government funding to support the development of new technologies for adults (e.g., military uses, workplace applications, scientific uses). There is also a fair amount of funding these days for evaluating the impact that these new technologies can have in teaching and learning. What is

more difficult to find are program initiatives that only fund the development of new technologies for children. In the "Report to the President on the Use of Technology to Strengthen K-12 Education in the United States," it explains, "...much of the promise of educational technology is likely to remain unfulfilled in the absence of a significant increase in the level of funding available for research in this area..." (Report to the President, 1997, p.95).

Therefore, when people ask me-- Where are people really being funded to make new technologies for children? I reply-- Europe! What began in September of 1998 was unprecedented funding from ESPRIT (the European Union's Information Technologies Program). Within ESPRIT is funding for long term research, and within that is the new i3 Experimental Schools Environment (ESE) research initiative. It is a long way of explaining that

for the first time, there is a relatively large amount of multi-year funding to support research in developing new technologies for children, teachers, and schools in Europe.

The reason I know about all of this, is that I am fortunate to be a part of one of these projects (KidStory) as a visiting researcher at the Royal Institute of Technology (KTH) in Sweden. At the end of this column is a listing of the 13 funded ESE projects with a few more words of information about each.

So why am I telling you about this new activity in Europe? Because for the first time in a long time, those of us who make new technologies for children are developing an on-going world-wide community for sharing ideas and discussion. If our community is ever to grow and mature, more of these kinds of opportunities need to be developed. While the ESE initiative is only in its first year of a three-year program, it has already come together for four days of workshops and presentations in Spain. It was there that my colleague Kristian Simsarian from the Swedish Institute of Computer Science led a very successful workshop with almost 50 participants. At this workshop, four of the ESE funded projects (KidStory, Pogo, Puppet, and Today's Stories) came together to discuss "Children and Narrative." What follows is a short summary by Kristian of that workshop's structure, presentations, and issues raised over the course of the day.

The What...

Narratives are ubiquitous. Some argue that the fundamental element in life is the story and storytelling can be viewed as a framework for almost all communication. In education, some would also promote that storytelling be acknowledged as fundamental to learning. Within the recently launched i3 ESE framework, there are a number of projects that have a focus on story-

telling. Within these projects, storytelling is introduced on many different levels. For example, storytelling is used for learning, for collaboration, for creative exploration, for sharing, and for participatory design. As these ESE projects develop, they can benefit from an inter-project awareness, focus and sharing of approach, current work and plans. The workshop offered an interactive forum where the different i3 members had a chance to present and work out these ideas of narrative with interested colleagues. The workshop consisted, primarily, of presentations from ESE projects. There were two presentation sessions with an average of two presentations from each of the four projects involved. The first session was entitled "Storytelling and tools" and consisted, for the most part, of technical presentations concerning the technologies being developed by the projects. "Children, Storytelling and Learning" was the title of the second session and was composed primarily of presentations from people working in schools. The work in the schools consisted of field-work and technical design sessions. At the end of the day, workshop participants split up into four groups to discuss issues concerning: narrative structure and tools; storytelling as learning; supporting collaboration; the role of children in research.

Some Things We Found Out...

Thanks to our day of presentations and discussion, we became aware that technology and storytelling played an important but different role in each of our research projects. For example, in the case of information technology (IT), there were a number questions raised:

- Should our research focus on how IT can reshape school learning experiences? Or is it instead to focus on creating new IT learning experiences

- that augment the current practices in the schools today or change them?
- Should our research focus on what relationships can be developed between child users and technology? Is this an opportunity to reshape the existing relationships between children, teachers and technology? Or should we be respecting what exists between child and teacher, and develop tools that augment that relationship?
 - Should our research focus on the design process and partnering to develop new tools? By building healthy relationships with schools in our design processes, are we changing the way technology is integrated in the schools? Can our work erode the feeling that technology is something that comes pre-packaged as opposed to something that can be created within the school context?

In addition to these questions, the workshop also heightened our awareness of the differing goals for storytelling technologies:

- Should our tools reshape storytelling? Do they replace and create a different way of telling stories in the classroom?
- Should our tools augment current practices? Do the tools somehow pick-up on current practices without disturbing the current form of storytelling practice.
- Should our tools provide completely new forms of storytelling? Are these tools somehow separate from anything that came before and thus provide entirely different and novel forms of storytelling?

Some Issues about Storytelling and Technology..

In our subgroup discussions, a number of issues also emerged. Below are just a few of the points raised:

There was some agreement about the general concept of storytelling being useful for learning and communication. On the other hand, the role computers play in that process was less than clear. Stories were said to be mechanisms for learning about anything. Perhaps by telling stories, children could be exercising their

knowledge. Some of the comments suggested that the less pre-determined the lessons were, the better it may work. But this raised the fundamental question of how to get stories started. Computers do offer the opportunity to augment storytelling practice in the schools through offering control of multimedia. Computer-generated sound, video, and graphics, offer channels for storytelling to provide new forms of expression. However, there was an agreement that the computer does have the ability to limit creativity and self-esteem if used in questionable ways.

Another question that was raised concerned who the storytelling audience is, and if there is an audience at all? Is it the researchers? The teachers? Other children? Is the process to create, perhaps perfect, and re-tell stories? Or is it more improvisational in that the creation is the telling? Does the telling involving acting, props, etc., or is it strictly storytelling? These are questions that a few of the projects were still working out for themselves and one answer was that whatever seems to be the most appropriate for the school setting is the correct approach. Though in some projects, such as Puppet, the notion of exploring and transferring ideas from the puppet-theater as a medium were specified from the outset.

All the projects in the ESE and i3 framework have a 'user-centered' design, thus in respect to HCI, the workshop was a meeting of friends. However, we found that there are variations in the details of how this research is conducted. The main differences were found to be in methods and evaluation. In particular, some of the projects have different perspectives on what role children and teachers take in the design process. For example, are the children, 'informants' for fieldwork? Are they 'partners' in the research process? Are they 'testers' of new technology? Many of these subtleties came out in the presentations of the second session and cannot be quickly summarized in this short column.

One issue that was repeated throughout the workshop was the innate dif-

ferences between 4 and 8 year olds (the target age group of the ESE funding Call). These differences are vast in reading/writing/curricular skills, in communication, in cooperation, etc. One message from the discussion was that different tools need to be developed for the different ages. This can possibly be accomplished by providing different features of the same tools, but it may turn out that the differences go beyond those attempts. Whatever the solution, it is clear that technology designers need to be aware of these differences and responsive to any new specifications that arise.

Another issue that came out of the discussion was the issue of scaffolding and its role in the storytelling process. The question among researchers was what was needed to build a framework for the creative process without over-restricting the possible outcomes. This issue is highly related to the intended goals of providing the storytelling tools. If storytelling fluency or problem-solving is the goal, it may be that scaffolding is necessary. While trying to encourage creative expression, scaffolding, or stocking the tools with building blocks, plays a sensitive role. If the story is stocked with farmyard characters, the stories are more likely to be about farms. Thus when thinking about what story scaffolding to provide, it is important to consider the end goals. This is an issue familiar to educators, but probably less so to technologists.

In terms of children and narrative, a number of models of collaboration were pointed out. Storytelling in and of itself is a collaborative practice since the storyteller needs a recipient to share stories. However, the story creation may follow a model where the creation is a solitary enterprise, becoming collaborative in the telling, or it may be a collaborative enterprise in the creation. There may be different forms of stories told, and the relationship between students and teachers as well as students and students may be different in different school settings.

In summary, all of the projects in the ESE are young, with the longest running in its sixth month and the newest in its second (at the time of the work-

shop in March). Thus, the presentations consisted of work in progress and final results were not expected. One purpose of the workshop was to solicit comments from other practitioners working in the area of children and narrative. While it was clear we were not going to develop final answers for children and narrative, one goal was to develop contacts, issues, and to begin a discussion. Though we may not be able to agree on a definition of narrative, we might in the future develop a vocabulary, and realize how these definitions and vocabulary choices influence our design of new storytelling technologies in the future.

I3 Experimental School Environments Projects

C3: Cultivating children's spatio-temporal reasoning through game-like activities that utilize innovative software tools and technologies. Contact: Manolis Koutlis, koutlis@cti.gr

Caress: Creates acoustic environments through wearable sensors, which motivate and empower children to develop creativity, imagination, and expression. Contact: Phil Ellis, p.v.ellis@warwick.ac.uk

Cab: Aims at providing children with construction kits that enable them to build and experiment with artificial

creatures. Contact: Grazia Filippi, grazia.scoulo@comune.re.it

eTui: A new intelligent physical device programmable by multi-sensory stimuli which will support children's learning. Contact: enquiries@ultralab.anglia.ac.uk

KidStory Developing collaborative storytelling environments for children with children using virtual, zoomable interfaces and reactive spaces. Contact: Steve Benford, sdb@cs.nott.ac.uk

NIMIS: Design and application of an integrated software and hardware concept for young learners in a computer-integrated classroom Contact: Ulrich Hoppe, hoppe@informatik.uni-duisburg.de

Puppet Virtual puppet theaters to explore new forms of early learning through children's construction, editing and direction of interactive plays. Contact: Mark Hartevelt, m.hartevelt@design.philips.com

Playground: To build worlds for kids to design and play with games and their underlying rules. Contact: Richard Noss, r.noss@ioe.ac.uk

Pogo With story-building as the key technology focus, favorite characters or props will be moved from the virtual story environment into the "real

world." Contact: Erik Granum, eg@vision.auc.dk

Today's Stories Reflections on early life experiences through creation and co-operative composition of stories using wearables. Contact: Walter Van de Velde, wvdv@starlab.net

ESE Working Groups: Chat: Working group studying how children become aware of the world around them. Contact: Ingrid Pramling Samuelsson, ingrid.pramling@ped.gu.se

KidsLab: Working group studying approaches to child-centered design of learning environments. Contact: Liselotte van Leuwen, kids@xs4all.nl

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