

# Digital Technologies and Marginalized Youth

**Juan Pablo Hourcade, Natasha E. Bullock-Rest**

Department of Computer Science

University of Iowa

Iowa City, IA 52242 USA

hourcade@cs.uiowa.edu, natasha-bullock-rest@uiowa.edu

**Heidi Schelhowe**

Computer Science Department

University of Bremen

PO Box 330440, D-28334 Bremen

Germany

schelhow@tzi.de

## ABSTRACT

Marginalization threatens basic issues of fairness and equal opportunity for a significant portion of children around the world. In this extended abstract, we frame the problem of marginalization in light of new economic forces and the increasingly ubiquitous role of digital technologies. We then summarize the contributions to the IDC 2010 workshop on Digital Technologies and Marginalized Youth. We conclude by discussing research trends and identifying challenges for future research.

## Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces - *Evaluation/Methodology, User-centered design*. K.4.2 [Computers and Society]: Social Issues. K.3.1 [Computers and Education]: Computer Uses in Education.

## General Terms

Human Factors, Design.

## Keywords

Children, marginalized youth, digital divide, developing regions, remote regions.

## INTRODUCTION AND BACKGROUND

Marginalization occurs when individuals or groups are excluded or in the peripheries of dominant groups. Marginalization has roots in geographic isolation, race, gender, class, nationality, ethnicity, religion, sexual orientation, learning disabilities, and so forth. It most often brings about reduced opportunities to fully take part in economic, political and social processes.

The new economy [5, 9, 10], with its increasing use of digital technologies and knowledge goods brings about new opportunities and challenges when addressing marginalization. On the one hand, it could easily connect marginalized groups to economic opportunities, from micro-loans to accessing far-away markets. On the other hand, it could deepen inequality for populations who are

not able to bridge the knowledge gap required to access, understand, make use, and produce digital goods [2, 7, 12].

One possible path to address these challenges is through education. In particular, educating young people so they have the option to use digital technologies to actively participate in the new economy, as well as in political social processes. Warschauer [15] discusses the types of skills necessary for the digital age in what he refers to as 21<sup>st</sup> century skills. These include digital-age literacy, inventive thinking, effective communication, and high productivity.

There are many challenges in helping marginalized youth develop these skills. In cases of geographic isolation, there are often basic limitations in terms of digital infrastructure and availability of qualified teachers or instructors to teach these skills. In other situations, the challenges include effectively engaging marginalized young people so they can take interest in learning critical skills, and trust that educational activities will result in positive outcomes in their lives.

In this, the third workshop on Digital Technologies and Marginalized Youth, held as part of the Interaction Design and Children conference, we continue discussions on the use of digital technologies to better the prospects of marginalized youth, and on the impact of digital technologies on this population.

Most position papers at the two previous workshops have addressed reaching marginalized youth in developed regions; using digital technologies primarily to increase economic opportunities. There have also been a few papers addressing the use of technologies in developing regions, where children are often exposed to particular technologies for the first time. This year's workshop follows a similar pattern.

## CONTRIBUTIONS OF POSITION PAPERS

Below, we summarize the contributions of the position papers presented in the workshop. We have organized the contributions into three areas. The contributions in the first area, technological approaches, discuss the technologies being considered and being used with marginalized youth. The second area, design issues, includes contributions discussing design principles and philosophies, and how these can have an impact on the use of technologies with marginalized youth. The third area, evaluating results in

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isolated regions, includes contributions discussing methods to evaluate the impact of technologies in remote geographies. It also includes results of evaluations from two such regions.

### **Technological Approaches**

#### *Mobile Phones, Video, and Learning*

Unterfrauner et al. [14] are working on the ComeIn project, which aims to take advantage of mobile phones to deliver mobile learning platforms. The goal is to promote skills related to obtaining and keeping jobs for teenagers and young adults who are jobless and may have limited education. In an ongoing pilot study, participants were provided phones, which delivered assignments in the form of challenge videos. For example, one challenge video asked participants to document where and how to get information about employers. Participants were encouraged to respond to these videos with their own videos that documented their experiences and shared their critical thinking about the challenges. These were automatically shared with other participants. Participants were also free to upload other videos. Most of the videos uploaded by participants so far have not been answers to challenges. Participants instead seem to have found the system useful as a way to meet and learn about other youth in similar situations to theirs.

The results of the project so far highlight the possible advantages of using mobile phones as a platform to reach marginalized youth, given that all participants used the system at some point. The challenge the project highlights is the difficulty in engaging marginalized youth in activities of interest to researchers and other institutions, in particular when there is not a link to a regular meeting space and time.

#### *Technologies for Participation in the Creative Sector*

Gaye et al. [4] are conducting research on promoting digital inclusion through creative activities with digital technologies leading to employment in the creative sector. They are addressing the challenge of engaging marginalized youth in these activities by partnering with existing organizations that are already engaging successfully with marginalized youth. One effort they are currently pursuing is introducing technologies for music composition and experimentation targeted at DJs and urban music producers. Another part of the project involves participatory design of technologies to help marginalized youth to encourage them to work. This project directly links expected outcomes and skills to those described in the "new economy" literature. The partnership with existing organizations that engage with marginalized youth points at a useful approach, as it has been successful for this project and for the one previously described.

#### *Social Media to Increase Social Capital*

Barn and Barn [1] discuss ideas for engaging young or juvenile offenders to promote social inclusion and reduce recidivism. The authors highlight the importance of increasing the social capital of these young people, defined

as "the values that people hold and the resources that they can access, which both result in and are the result of collective and socially negotiated ties and relationships." To address this need, the authors propose the use of social media combined with customer relationship management to better engage target populations. The authors also discuss the use of virtual worlds to learn social skills in a serious games environment. These environments should be used with care to ensure negative social behaviors are not reinforced.

#### *Multiplayer Videogames to Develop Collaboration Skills*

Decortis et al. [3] discuss how online multiplayer video games may be used to develop collaboration skills. This may be an appealing approach to reach youth who do not have these skills, but enjoy playing video games. How the skills can be developed may be gleaned through the use of collaboration models. The authors propose adapting existing models to playing games such as Counterstrike, commonly used in LAN parties. The dimensions of the proposed model include interpersonal understanding, teamwork, cooperation and team leadership. This paper highlights the importance of developing models to better understand how to apply technologies to specific needs of marginalized youth, and how to evaluate these technologies once they are deployed.

### **Design Issues**

#### *Designing for Children with ADHD*

McKnight [6] discusses a different kind of marginalization in the difficulties children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) can face in school settings. She argues that some children can be marginalized if they learn in different ways from others and need different school environments, yet have to attend the same schools as typically developing children. Similar issues can occur with educational software, if it is not designed while taking into account the needs of children with special educational needs.

To address this gap, this position paper provides a set of principles for designing technologies for children diagnosed with ADHD. These guidelines include: using neat, organized, and uncluttered layouts, avoiding unnecessarily decorations or distractions, providing informative feedback, highlighting important information, using large fonts, providing visual aids for reading, and using brief and clear instructions.

#### *Design Philosophies behind Education-Oriented Laptops*

Payán [8] compares the designs and educational philosophies behind Intel's Classmate PC and the XO laptops from the One Laptop Per Child (OLPC) Foundation. The context of the discussion is centered on issues of access to information and communication technologies in developing regions, in particular Latin America. The discussion also involves the role of new skills or 21<sup>st</sup> century skills, in this case from the viewpoint of MIT's Henry Jenkins.

Classmate PC appears to better fit the approach used in teaching in most of these countries, where the teacher is given control of the classroom and of what children do with their computers. OLPC follows a constructionist approach, shifting power towards the children and self-empowered learning, as opposed to teacher directed activities. OLPC's emphasis is on exploration and expression instead of instruction. Control is distributed rather than centralized. In discussing the differences between the two platforms, the author points at how educational authorities embrace constructivist and constructionist approaches, but practice tends to follow an "information transfer" approach.

### **Evaluating Results in Isolated Regions**

#### *Impact of Computers in Rural Chilean Schools*

Sánchez [11] used a combination of quantitative data from surveys sent to 102 rural schools and qualitative data from interviews and classroom observations at 14 rural schools to learn about the use of computers by children in remote areas of Chile. The dual approach provides a useful example of how similar research may be conducted, as the impact of information and communication technologies is likely to be most difficult to assess in these locations.

The author learned that even though parents often have limited education, they are usually willing to help their children with the use of computers. A somewhat surprising result was that most children learned to use the Internet from friends or others, about a third taught themselves, only about one in ten learned to use the Internet from teachers. In spite of this finding, school is the most common place where children access the Internet and computer technology. In these remote areas, teachers also have access to computer technology primarily at school.

The author learned that the Internet is seen as a window into the world. Teachers value it as a way to access information, provide opportunities to relate to people from other places, and provide greater equity.

This paper highlights the importance of learning how computers are used in remote regions, and how they can enhance the role of schools and teachers.

#### *Impact of Computers in Isolated Regions of Greece*

In a similar effort, Spiridonidou et al. [13] used cultural probes to learn about the use of computers in remote areas of Greece, many of them small islands. In this project, fourteen remote schools received cultural probes from the authors. The goal was to track the deployment and effect of delivering new laptop computers to all students in secondary education. The cultural probes included a camera, office materials and a recordable CD. The authors asked students to record experiences in their school. When they received the materials from the schools, the authors used affinity diagrams to understand the data. This enabled them to learn about uses of the Internet and infrastructure problems. While use of computers and the Internet was perhaps less frequent than expected, through the probes, the authors learned that all students owned mobile phones.

## **DISCUSSION**

### **Reaching Marginalized Youth**

One theme that emerges from the position papers is the need to engage with existing organizations and institutions to better reach marginalized youth. In developed regions, it is often community-based organizations that are already reaching out to young people that can provide useful links and credibility when engaging with them. These organizations can also provide a place to conduct participatory design sessions to design technologies, which can potentially increase the acceptance of the technology by young people. In developing regions, schools are often a useful institution to reach children and provide them with access to technologies, as well as the environment to learn how to use them.

### **When and How is Technology Used?**

There were two main approaches to how and when marginalized young people would use technologies. One approach is distributed, where even if young people are contacted through organizations or institutions, they use the technologies in their own time, at a place of their choosing. Examples include the ComeIn project using mobile phones and the use of online multiplayer video games.

The other approach is to conduct activities with technology at specific times and places. This is often the case if technologies are deployed in schools or if they are used primarily in community centers and similar organizations. A hybrid approach is the one followed by OLPC. In this case, the laptops are used in school, but continue being used after school in ways selected by the children and possibly family members or friends.

### **What is Missing?**

A somewhat disturbing pattern in the position papers presented in this and previous workshops on the same topic is the relative lack of projects coming from institutions in the United States. This is particularly obvious in comparison with the greater proportion of research from the United States presented in human-computer interaction conferences, and in the Interaction Design and Children conference itself. The reasons behind the difference are not entirely clear. Perhaps some of it has to do with the lack of funding vehicles in the United States specifically targeting marginalized youth, in particular in comparison with European Union funding of this line of research. Political trends may also play a role.

Something else that is missing is direct participation from members of marginalized communities in leading the research, and designing the technologies to help young people from the same communities. Most of the research presented in this and previous workshops involves technologies designed by people from dominant groups (albeit with the best of intentions) to help young people from marginalized groups. Future efforts should put an emphasis first on using participatory design techniques to incorporate the voices of the marginalized in the design process. An additional future step should be to incorporate

people who originate from the targeted communities as research leaders.

A third aspect that is missing is research on reducing the causes of marginalization targeted at dominant groups. Although there are often elements of self-marginalization, dominant groups also play a role in marginalizing young people. We have seen little research in engaging dominant groups to change attitudes and actions toward marginalized populations. It seems like an obvious and very useful complement to the research that has been presented in these workshops would be research that brings together children from dominant and marginalized groups to learn about their common humanity.

#### CONCLUSION

A fair, more just world can be possible if brilliant minds and busy hands work on providing equal opportunities to all the children of the world. In this extended abstract, we have framed the issue of marginalization from the perspective of changing economic forces and the increasingly ubiquitous role of digital technologies. We then summarized the contributions of the papers presented in this year's workshop on Digital Technologies and Marginalized Youth. Finally, we discussed research trends and highlighted challenges for future research.

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